Data preparation for variability analysis of CD4$^+$ T cells using BASiCS

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1 Data pre-processing and quality control steps

1.1 Downloading the data

The matrix with raw read counts can be obtained from ArrayExpress under the accession number E-MTAB-4888. In the matrix, column names contain library identifiers and row names display Ensembl gene identifiers.

```r
library("readxl")
library("ggplot2")
library("scater")
```

```
## Loading required package: SingleCellExperiment


## Loading required package: SummarizedExperiment


## Loading required package: MatrixGenerics


## Loading required package: matrixStats


##
## Attaching package: 'MatrixGenerics'
```

```
## The following objects are masked from 'package:matrixStats':
##
##      colAlls, colAnyNAs, colAnys, colAvgsPerRowSet, colCollapse,
##      colCounts, colCummaxs, colCummins, colCumprods, colCumsums,
##      colDiffs, colIQRDiffs, colIQRs, colLogSumExps, colMadDiffs,
##      colMads, colMaxs, colMeans2, colMedians, colMins, colOrderStats,
##      colProds, colQuantiles, colRanges, colRanks, colSdDiffs, colSds,
##      colSums2, colTabulates, colVarDiffs, colVars, colWeightedMads,
##      colWeightedMeans, colWeightedMedians, colWeightedSds,
##      colWeightedVars, rowAlls, rowAnyNAs, rowAnys, rowAvgsPerColSet,
##      rowCollapse, rowCounts, rowCummaxs, rowCummins, rowCumprods,
##      rowCumsums, rowDiffs, rowIQRDiffs, rowIQRs, rowLogSumExps,
##      rowMadDiffs, rowMads, rowMaxs, rowMeans2, rowMedians, rowMins,
##      rowOrderStats, rowProds, rowQuantiles, rowRanges, rowRanks,
##      rowSdDiffs, rowSds, rowSums2, rowTabulates, rowVarDiffs, rowVars,
##      rowWeightedMads, rowWeightedMeans, rowWeightedMedians,
##      rowWeightedSds, rowWeightedVars


## Loading required package: GenomicRanges


## Loading required package: stats4


## Loading required package: BiocGenerics


##
## Attaching package: 'BiocGenerics'


## The following objects are masked from 'package:stats':
##
##      IQR, mad, sd, var, xtabs


## The following objects are masked from 'package:base':
##
##      anyDuplicated, aperm, append, as.data.frame, basename, cbind,
##      colnames, dirname, do.call, duplicated, eval, evalq, Filter, Find,
##      get, grep, grepl, intersect, is.unsorted, lapply, Map, mapply,
##      match, mget, order, paste, pmax, pmax.int, pmin, pmin.int,
##      Position, rank, rbind, Reduce, rownames, sapply, setdiff, sort,
##      table, tapply, union, unique, unsplit, which.max, which.min


## Loading required package: S4Vectors


##
## Attaching package: 'S4Vectors'


## The following object is masked from 'package:utils':
##
##      findMatches


## The following objects are masked from 'package:base':
##
##      expand.grid, I, unname
```

```
## Loading required package: IRanges

## Loading required package: GenomeInfoDb

## Loading required package: Biobase

## Welcome to Bioconductor
##
##      Vignettes contain introductory material; view with
##      'browseVignettes()'. To cite Bioconductor, see
##      'citation("Biobase")', and for packages 'citation("pkgname")'.

##
## Attaching package: 'Biobase'

## The following object is masked from 'package:MatrixGenerics':
##
##      rowMedians

## The following objects are masked from 'package:matrixStats':
##
##      anyMissing, rowMedians

## Loading required package: scuttle
```

```r
library("scran")
library("BASiCS")
```

```
##      Welcome to 'BASiCS'. If you used 'BASiCS' before its release in
##      Bioconductor, please visit:
##      https://github.com/catavallejos/BASiCS/wiki.
```

```r
library("BiocStyle")
library("biomaRt")
library("patchwork")
if (!file.exists("downloads/")) {
  dir.create("downloads", showWarnings = FALSE)
}
if (!dir.exists("downloads/MarioniLab-ImmuneAging2017-5b665d1")) {
  website <- "https://zenodo.org/"
  folder <- "record/3522970/files/MarioniLab/"
  file <- "ImmuneAging2017-1.0.0.zip"
  download.file(
    paste0(website, folder, file),
    destfile = "downloads/ImmuneAging2017-1.0.0.zip"
  )
  unzip("downloads/ImmuneAging2017-1.0.0.zip", exdir = "downloads")
}
cd4_raw <- read.table(
  "downloads/MarioniLab-ImmuneAging2017-5b665d1/Data/raw_data.txt",
  header = TRUE,
  sep = "\t"
)
cd4_raw <- as.matrix(cd4_raw)
```

The input matrix contains data for 1,513 cells and 31,181 genes, including 92 ERCC spike-ins.

Information about experimental conditions and other metadata is available under the same accession number.

```
cd4_metadata <- read_xlsx(
  "downloads/MarioniLab-ImmuneAging2017-5b665d1/Data/metadata.xlsx"
)
```

```
## New names:
## * '' -> '...1'
```

```
cd4_metadata <- as.data.frame(cd4_metadata)

## Save sample identifiers as rownames
rownames(cd4_metadata) <- cd4_metadata$CellName
```

The columns in the metadata file contain library identifiers (`X`), strain information (`Strain`; *Mus musculus castaneus* or *Mus musculus domesticus*), the age of the animals (`Age`; young or old), stimulation state of the cells (`Stimulus`; naive or activated), batch information (`Individuals`; associated to different mice), and cell type information (`Celltype`; via FACS or MACS purification).

Here, we convert the data and metadata described above into a `SingleCellExperiment` object. For this purpose, we first separate the input matrix of expression counts into two matrices associated to intrinsic genes and external spike-ins, respectively. Within the `SingleCellExperiment` object, the latter is stored separately as an *alternative experiment*. For more details on the alternative experiment slot, see `help("altExp")`.

```
## Separate intrinsic from ERCC counts
bio_counts <- cd4_raw[!grepl("ERCC", rownames(cd4_raw)), ]
spike_counts <- cd4_raw[grepl("ERCC", rownames(cd4_raw)), ]
## Generate the SingleCellExperiment object
sce_cd4_all <- SingleCellExperiment(
  assays = list(counts = bio_counts),
  colData = cd4_metadata[colnames(cd4_raw), ]
)
## Add read-counts for spike-ins as an alternative experiment
altExp(sce_cd4_all, "spike-ins") <- SummarizedExperiment(
  assays = list(counts = spike_counts)
)
```

Hereafter, our analysis focuses on naive CD4$^+$ T cells in the presence and absence of stimulation using plate-bound antibodies,+ obtained from young *Mus musculus domesticus* animals, and purified using MACS-based cell sorting. Thus, we subset the `SingleCellExperiment` object to these 146 cells.

```
ind_select <- sce_cd4_all$Strain == "Mus musculus domesticus" &
  sce_cd4_all$Age == "Young" &
  sce_cd4_all$Celltype == "MACS-purified Naive"
sce_naive_active <- sce_cd4_all[, ind_select]
sce_naive_active
```

```
## class: SingleCellExperiment
## dim: 31089 146
## metadata(0):
## assays(1): counts
```

```
## rownames(31089): ENSMUSG00000000001 ENSMUSG00000000003 ...
##   ENSMUSG00000106668 ENSMUSG00000106670
## rowData names(0):
## colnames(146): SS51_naive_2 SS51_naive_6 ... SS52_active_49
##   SS52_active_51
## colData names(7): ...1 Strain ... Celltype CellName
## reducedDimNames(0):
## mainExpName: NULL
## altExpNames(1): spike-ins
```

1.2 Gene annotation

Input data was annotated using Ensembl gene identifiers. To facilitate interpretation, it is often useful to obtain a mapping from Ensembl gene IDs to gene symbols using the BioMart suite (http://www.biomart.org) via the Bioconductor package *biomaRt* (Durinck et al. 2009). This can also be used to obtain gene-pathways mappings and other metadata (e.g. gene length), useful for performing functional analysis of gene sets identified in downstream analyses.

```r
# Check if data storage folder exists and create it if needed
if (!dir.exists("rds")) {
  dir.create("rds", showWarnings = FALSE)
}
if (!file.exists("rds/genenames.Rds")) {
  # Initialize mart and dataset
  ensembl <- useEnsembl(
    biomart = "genes",
    version = 104,
    dataset = "mmusculus_gene_ensembl"
  )
  # Select gene ID and gene name
  genenames <- getBM(
    attributes = c("ensembl_gene_id", "external_gene_name", "gene_biotype",
                   "chromosome_name", "description"),
    mart = ensembl
  )
  rownames(genenames) <- genenames$ensembl_gene_id
  # Store information for future use
  saveRDS(genenames, "rds/genenames.Rds")
}
# Load pre-downloaded gene annotation information
genenames <- readRDS("rds/genenames.Rds")
```

We add this information as `rowData` within the `SingleCellExperiment` object created above.

```r
## Merge biomaRt annotation
rowdata <- data.frame(ensembl_gene_id = rownames(sce_naive_active))
rowdata <- merge(rowdata, genenames, by = "ensembl_gene_id", all.x = TRUE)
rownames(rowdata) <- rowdata$ensembl_gene_id
## Check if  order is correct after merge;
stopifnot(all(rownames(rowdata) == rownames(sce_naive_active)))
## add to the SingleCellExperiment object
rowData(sce_naive_active) <- rowdata
```

For the remaining analysis, we will only focus on the 18,682 protein coding genes that are contained in the data. These are selected below.

```
protein_coding <- which(
  rowData(sce_naive_active)$gene_biotype == "protein_coding"
)
sce_naive_active <- sce_naive_active[protein_coding, ]
```

1.3 QC and exploratory data analysis

The data available at E-MTAB-4888 have been already filtered to remove poor quality samples. The QC applied in (Martinez-Jimenez et al. 2017) removed cells with: (i) fewer than 1,000,000 total reads, (ii) less than 20% of reads mapped to endogenous genes, (iii) less than 1,250 or more than 3,000 detected genes and (iv) more than 10% or fewer than 0.5% of reads mapped to mitochondrial genes. We include visualisations of these measures here; we also include another widely used QC diagnostic plot that compares the total number (or fraction) of spike-in counts versus the total number (or fraction) of endogeneous counts. In such a plot, low quality samples are characterised by a high fraction of spike-in counts and a low fraction of endogeneous counts (see Figure 1).

```
sce_naive_active <- addPerCellQC(sce_naive_active, use_altexps = TRUE)
p_cell_qc1 <- plotColData(
  sce_naive_active,
  x = "sum",
  y = "detected") +
  xlab("Total endogenous reads per cell") +
  ylab("Number of detected genes per cell") +
  theme(axis.text.x = element_text(hjust = 1, angle = 45))
p_cell_qc2 <- plotColData(
  sce_naive_active,
  x = "sum",
  y = "altexps_spike-ins_sum") +
  xlab("Total endogenous reads per cell") +
  ylab("Total spike-in reads per cell") +
  theme(axis.text.x = element_text(hjust = 1, angle = 45))
p_cell_qc1 + p_cell_qc2
```

We can also visualise these metrics with respect to cell-level metadata, such as the experimental conditions (active vs unstimulated) and the different mice from which cells were collected (see Figure 2).

```
p_stimulus <- plotColData(
    sce_naive_active,
    x = "sum",
    y = "detected",
    colour_by = "Stimulus"
  ) +
  xlab("Total endogenous reads per cell") +
  ylab("Number of detected genes per cell") +
  theme(
    legend.position = "bottom",
    axis.text.x = element_text(angle = 45, hjust = 1)
  )
p_batch <- plotColData(
```
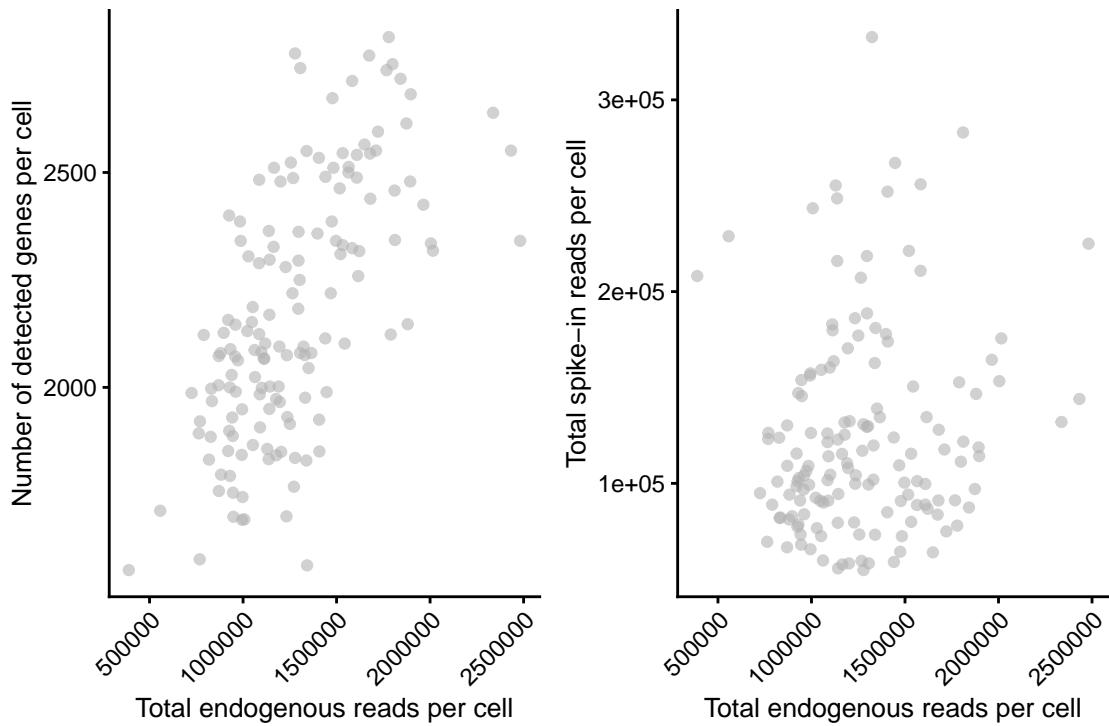
Figure 1: Cell-level QC metrics. The total number of endogenous read-counts (excludes non-mapped and intronic reads) is plotted against the total number of detected genes (left) and the total number of spike-in read-counts (right).

```
    sce_naive_active,
    x = "sum",
    y = "detected",
    colour_by = "Individuals"
  ) +
  xlab("Total endogenous reads per cell") +
  ylab("Number of detected genes per cell") +
  theme(
    legend.position = "bottom",
    axis.text.x = element_text(angle = 45, hjust = 1)
  )
p_stimulus + p_batch
```
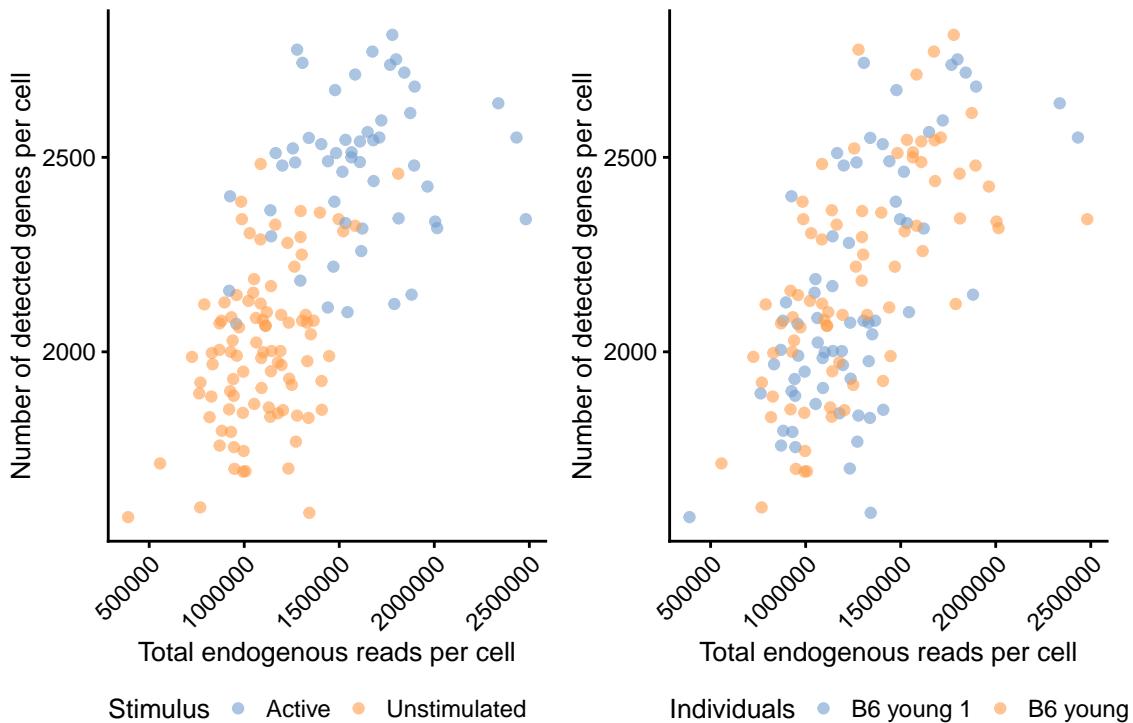

Figure 2: Cell-level QC metrics according to cell-level metadata. The total number of endogenous reads (excludes non-mapped and intronic reads) is plotted against the total number of detected genes. Colour indicates the experimental condition (left) and animal of origin (right) for each cell.

To further explore the underlying structure of the data, we perform global scaling normalisation using *scran* and principal component analysis (PCA) of log-transformed normalised expression counts using *scater*. As seen in Figure 3, this analysis suggests the absence of strong batch effects. It should be noted that the estimation of global scaling normalisation factors using *scran* is not strictly necessary in the *BASiCS* workflow. Here, we only use it as part of the exploratory data analysis. Moreover, count-based models for dimensionality reduction (e.g. (Townes et al. 2019; Lopez et al. 2018)) could be used as an alternative to PCA, removing the need for log normalisation.

```
## Global scaling normalisation + log tranformation + PCA
sce_naive_active <- computeSumFactors(sce_naive_active)
sce_naive_active <- logNormCounts(sce_naive_active)
```

```
sce_naive_active <- runPCA(sce_naive_active)
p_stimulus <- plotPCA(sce_naive_active, colour_by = "Stimulus") +
  theme(legend.position = "bottom")
p_batch <- plotPCA(sce_naive_active, colour_by = "Individuals") +
  theme(legend.position = "bottom")
p_stimulus + p_batch
```
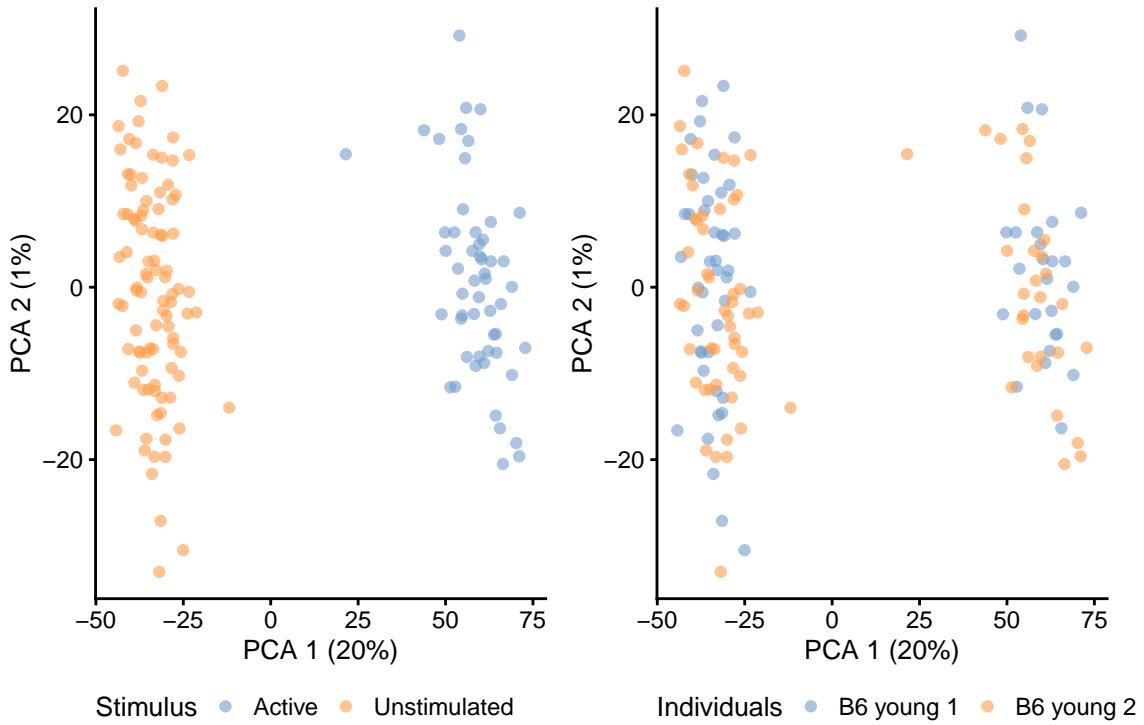

Figure 3: First two principal components of log-transformed expression counts after scran normalisation. Colour indicates the experimental condition (left) and animal of origin (right) for each cell.

In addition to cell-specific QC, we also recommend a gene filtering step prior to using *BASiCS*. The purpose of this filter is to remove lowly expressed genes that were largely undetected through sequencing, making reliable variability estimates difficult to obtain. Here, we remove genes that are not detected in at least 20 cells across both conditions, or that have an average read count below 1. These thresholds can vary across datasets and should be informed by gene-specific QC metrics such as those shown in Figure 4 as well as prior knowledge about the cell types and conditions being studied, where available.

```
## Add QC measures based on features
sce_naive_active <- addPerFeatureQC(sce_naive_active, exprs_values = "counts")

## Remove genes with zero total counts across all cells
sce_naive_active <- sce_naive_active[rowData(sce_naive_active)$detected != 0, ]

## Transform "detected" into number of cells and define inclusion criteria
rowData(sce_naive_active)$detected_cells <-
  rowData(sce_naive_active)$detected * ncol(sce_naive_active) / 100

## define thresholds for genes based on QC measures
```

```
detected_threshold <- 20
mean_threshold <- 1

## apply thresholds
include_gene <- rowData(sce_naive_active)$mean >= mean_threshold &
  rowData(sce_naive_active)$detected_cells >= detected_threshold

## add gene QC filter to rowdata for visualisation
rowData(sce_naive_active)$include_gene <- include_gene

## plot gene QC filter
plotRowData(
    sce_naive_active,
    x = "detected_cells",
    y = "mean",
    colour_by = "include_gene"
  ) +
  xlab("Number of cells in which expression was detected") +
  ylab("Average number of read counts across all cells") +
  scale_x_log10() +
  scale_y_log10() +
  theme(legend.position = "bottom") +
  geom_vline(
    xintercept = detected_threshold,
    linetype = "dashed",
    col = "grey60"
  ) +
  geom_hline(
    yintercept = mean_threshold,
    linetype = "dashed",
    col = "grey60"
  )
```

```
## Apply gene QC filter
sce_naive_active <- sce_naive_active[rowData(sce_naive_active)$include_gene, ]
```

Subsequently, we also require users to remove spike-in molecules that were not captured through sequencing. We do this separately for naive and active cells.

```
ind_active <- sce_naive_active$Stimulus == "Active"
ind_naive <- sce_naive_active$Stimulus == "Unstimulated"
spikes <- assay(altExp(sce_naive_active))
detected_spikes_active <- rowSums(spikes[, ind_active] > 0) > 0
detected_spikes_naive <- rowSums(spikes[, ind_naive] > 0) > 0
detected_spikes <- detected_spikes_naive & detected_spikes_active
altExp(sce_naive_active) <- altExp(sce_naive_active)[detected_spikes, ]
```

1.4 Spike-in concentrations

If spike-ins will be used to aid data normalisation and technical noise quantification, *BASiCS* also requires the number of spike-in molecules that were added to each well. For each spike-in i, this corresponds to:
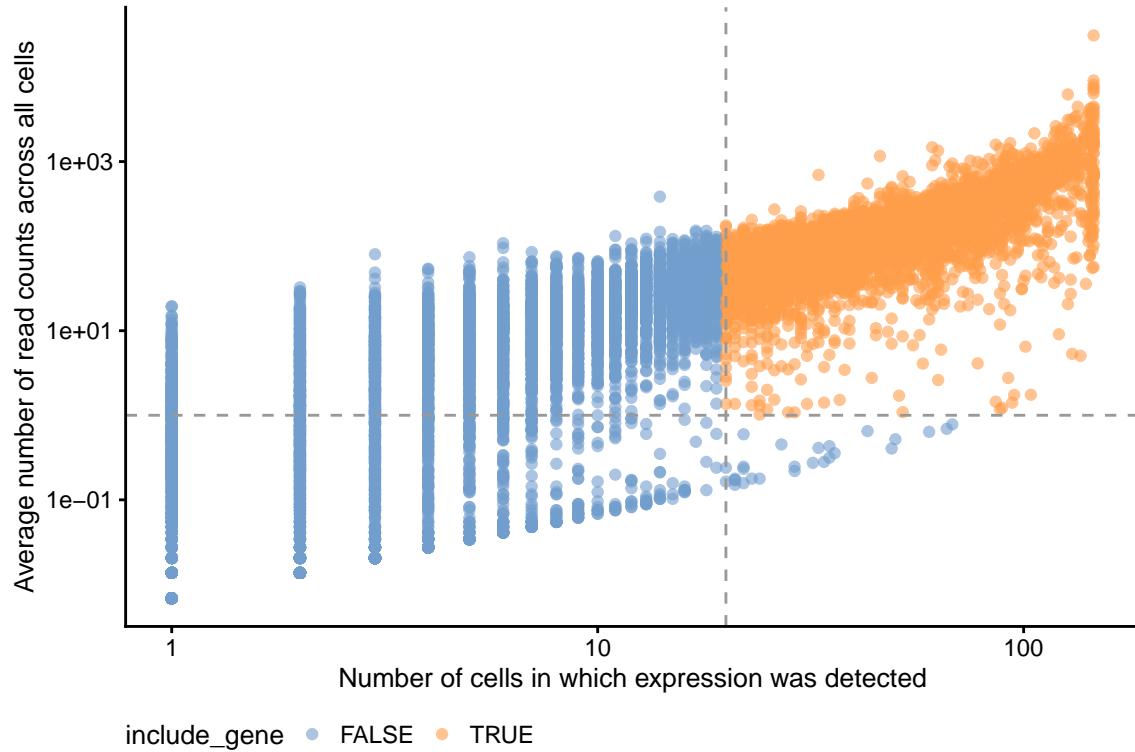
Figure 4: Average read-count for each gene is plotted against the number of cells in which that gene was detected. Dashed grey lines are shown at the thresholds below which genes are removed.

$$\mu_i = C_i \times 10^{-18} \times (6.022 \times 10^{23}) \times V \times D \quad \text{where,}$$

- C_i is the concentration for the spike-in i (measured in $aM\mu l^{-1}$),
- V is the volume added into each well (measure in nl) and
- D is a dilution factor.

The remaining factors in the equation above are unit conversion constants (e.g. from moles to molecules). For the CD4$^+$ T cell data, the authors added a 1:50,000 dilution of the ERCC spike-in mix 1 and a volume of $9nl$ was added into each well (see https://www.fluidigm.com/faq/ifc-9). Finally, input concentrations C_i can be downloaded with the Bioconductor package *scRNAseq*, using the function `ERCCSpikeInConcentrations()`.

Based on this information, we can use `BASiCS_CalculateERCC` to calculate the amount of spike-in molecules in each well:

```
ERCC_count <- BASiCS_CalculateERCC(Mix = 1, DilutionFactor = 1/50000, VolumePerCell = 0.009)
```

```
## see ?scRNAseq and browseVignettes('scRNAseq') for documentation
```

```
## downloading 1 resources
```

```
## retrieving 1 resource
```

```
## loading from cache
```

To update the `sce_naive` and `sce_active` objects, the user must create a `data.frame` whose first column contains the spike-in labels (e.g. ERCC-00130) and whose second column contains the number of molecules calculated above. We add this as row metadata for `altExp(sce_naive)` and `altExp(sce_active)`.

```
SpikeInput <- data.frame(
  Names = names(ERCC_count),
  count = ERCC_count
)
## Exclude spike-ins not included in the input SingleCellExperiment objects
ind_match <- match(rownames(altExp(sce_naive_active)), SpikeInput$Names)
SpikeInput <- SpikeInput[ind_match , ]
## Add as metadata
rowData(altExp(sce_naive_active)) <- SpikeInput
```

The final dataset used in subsequent analyses contains 146 cells, 5171 genes and 49 spike-ins.

```
ind_active <- sce_naive_active$Stimulus == "Active"
ind_naive <- sce_naive_active$Stimulus == "Unstimulated"
sce_naive <- sce_naive_active[, ind_naive]
sce_active <- sce_naive_active[, ind_active]

saveRDS(sce_naive, "rds/sce_naive.Rds")
saveRDS(sce_active, "rds/sce_active.Rds")
```

2 Running the BASiCS model

Here, we fit the BASiCS model using two separate versions. The first version uses technical spike-in to aid global scaling normalisation and technical noise quantification. The second version ignores spike-in genes. Instead, technical noise is quantified by borrowing information across the different batches of cells. The latter is based on the horizontal integration approach described by Eling et al. (2018).

2.1 Inference using spike-ins

```
set.seed(42)
chain_naive <- BASiCS_MCMC(
  Data = sce_naive,
  PrintProgress = TRUE,
  N = 40000,
  Thin = 20,
  Burn = 20000,
  Regression = TRUE,
  Threads = 4,
  StoreChains = TRUE,
  StoreDir = "rds/",
  RunName = "naive",
  WithSpikes = FALSE
)
```

```
## Warning in .BASiCS_MCMC_InputCheck(Data, N, Thin, Burn, Regression, WithSpikes, : 'Data' should conta
```

```
## Please assign the batch information to:
##
##          'colData(Data)$BatchInfo = BatchInfo'.


## Warning in .ChecksBASiCS_Data(Data, WithSpikes): Some genes have zero counts across all cells.
## If comparing 2 groups, use 'PriorDelta = 'log-normal' in BASiCS_MCMC.
## If not, please remove those genes.


## Running no spikes BASiCS sampler (regression case) ...


## ---------------------------------------------------------
## MCMC sampler has been started: 40000 iterations to go.
## ---------------------------------------------------------
## ---------------------------------------------------------
## Iteration 0 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.238
## delta (gene 1): 8.8323
## s (cell 1): 1.83289
## nu (cell 1): 1.01805
## theta (batch 1): 0.983332
## betas:   -0.1704  -0.0786  -0.7248  -1.0030   4.1852  -2.5072  -1.1383   5.2645  -1.1755   0.9925  (
##
## sigma: 0.511574
## lambda (gene 1): 1.57881
## epsilon (gene 1): -0.139954
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -4
## LSdelta (gene 1): -2
## LSnu (cell 1): -10
## LStheta (batch 1): -4
## ---------------------------------------------------------
## Iteration 40 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 146.497
## delta (gene 1): 16.5284
## s (cell 1): 0.671292
## nu (cell 1): 1.02873
## theta (batch 1): 0.186608
## betas:    0.7050  -0.0346  -0.4589   0.9855   0.8475   1.4980   0.6969   1.2293   1.2929   0.2169  -(
##
## sigma: 0.190511
## lambda (gene 1): 0.920416
## epsilon (gene 1): 0.00775527
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -4
## LSdelta (gene 1): -2
## LSnu (cell 1): -10
## LStheta (batch 1): -4
```

```
## --------------------------------------------------------
## Iteration 80 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 440.337
## delta (gene 1): 14.9057
## s (cell 1): 1.10729
## nu (cell 1): 1.10939
## theta (batch 1): 0.0509046
## betas:    1.7447  -0.3675   0.1926   0.1211   0.4738   1.0297   0.6218   1.3866   1.4414   0.5677   (
##
## sigma: 0.166293
## lambda (gene 1): 0.357549
## epsilon (gene 1): -0.478444
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.9
## LStheta (batch 1): -3.9
## --------------------------------------------------------
## Iteration 120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 428.78
## delta (gene 1): 13.0575
## s (cell 1): 1.17268
## nu (cell 1): 1.04923
## theta (batch 1): 0.0399784
## betas:    1.3723  -0.1130   0.3048   0.7204   0.8598   0.3253   1.4142   0.7234   1.1638   0.4988   -(
##
## sigma: 0.15115
## lambda (gene 1): 1.71464
## epsilon (gene 1): -0.00633717
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -9.8
## LStheta (batch 1): -3.8
## --------------------------------------------------------
## Iteration 160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.974
## delta (gene 1): 19.4961
## s (cell 1): 0.91192
## nu (cell 1): 1.06739
## theta (batch 1): 0.0222824
## betas:    1.7053  -0.2004  -0.0713   0.2034   0.2491   0.7723   0.7271   1.1565   1.0022   0.6191   -(
##
## sigma: 0.158072
## lambda (gene 1): 1.54457
## epsilon (gene 1): 0.233605
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.7
## LStheta (batch 1): -3.7
## ----------------------------------------------------------
## Iteration 200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.311
## delta (gene 1): 13.7119
## s (cell 1): 0.83543
## nu (cell 1): 1.10917
## theta (batch 1): 0.0778157
## betas:    1.4075  -0.1648   0.3704   0.0580   0.8063   0.8965   0.7613   1.1884   0.9029   1.1618  -(
##
## sigma: 0.182111
## lambda (gene 1): 0.811868
## epsilon (gene 1): -0.150974
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.6
## LStheta (batch 1): -3.6
## ----------------------------------------------------------
## Iteration 240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.51
## delta (gene 1): 18.3442
## s (cell 1): 1.20732
## nu (cell 1): 1.07667
## theta (batch 1): 0.0144584
## betas:    1.6249  -0.1680   0.5837   0.1373  -0.0617   1.0325   0.7890   0.9509   1.1065   0.6644  -(
##
## sigma: 0.163138
## lambda (gene 1): 0.559213
## epsilon (gene 1): 0.181309
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.6
## LStheta (batch 1): -3.6
## ----------------------------------------------------------
## Iteration 280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.842
## delta (gene 1): 15.1351
## s (cell 1): 1.06197
## nu (cell 1): 1.10586
```

```
## theta (batch 1): 0.00521215
## betas:     0.9046  -0.1240   0.3671   0.1906   0.4446   0.9515   1.2642   0.9862   1.3476   0.8482  -(
##
## sigma: 0.166198
## lambda (gene 1): 2.11193
## epsilon (gene 1): 0.24527
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.5
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -9.5
## LStheta (batch 1): -3.5
## ---------------------------------------------------------
## Iteration 320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 221.704
## delta (gene 1): 12.7236
## s (cell 1): 1.02103
## nu (cell 1): 1.02483
## theta (batch 1): 0.00739957
## betas:     1.4780  -0.2371   0.3529  -0.0246   0.3950   0.8864   1.0274   0.8795   1.4641   0.6743  -(
##
## sigma: 0.162885
## lambda (gene 1): 0.718333
## epsilon (gene 1): -0.154303
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.4
## LStheta (batch 1): -3.4
## ---------------------------------------------------------
## Iteration 360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 315.063
## delta (gene 1): 16.5304
## s (cell 1): 0.924129
## nu (cell 1): 1.0368
## theta (batch 1): 0.0080513
## betas:     1.4696  -0.2961   0.1486  -0.0009   0.2175   0.6913   0.9509   1.2574   1.1676   1.2022  -(
##
## sigma: 0.156905
## lambda (gene 1): 3.03361
## epsilon (gene 1): -0.00547568
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.3
## LStheta (batch 1): -3.3
## ---------------------------------------------------------
## Iteration 400 out of 40000 has been completed.
```

```
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.075
## delta (gene 1): 18.0478
## s (cell 1): 1.19281
## nu (cell 1): 1.07068
## theta (batch 1): 0.00348281
## betas:    1.1417  -0.1320   0.7978   0.7286   0.4511   0.6495   1.3822   0.8016   1.1945   1.0206   -(
##
## sigma: 0.1859
## lambda (gene 1): 0.584486
## epsilon (gene 1): -0.0648914
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -9.2
## LStheta (batch 1): -3.2
## ---------------------------------------------------------
## Iteration 440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 322.649
## delta (gene 1): 10.7246
## s (cell 1): 0.979177
## nu (cell 1): 1.06927
## theta (batch 1): 0.00288236
## betas:    1.9365  -0.2013   0.6425  -0.1689  -0.0825   1.1532   0.6853   0.6668   1.2838   0.5824   -(
##
## sigma: 0.161792
## lambda (gene 1): 0.61408
## epsilon (gene 1): -0.598876
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -9.2
## LStheta (batch 1): -3.2
## ---------------------------------------------------------
## Iteration 480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 285.295
## delta (gene 1): 15.4158
## s (cell 1): 1.0814
## nu (cell 1): 1.06905
## theta (batch 1): 0.00139052
## betas:    1.6755  -0.2742   0.2857  -0.1190   0.2731   0.5078   1.2079   0.7219   1.4297   0.9636   -(
##
## sigma: 0.166633
## lambda (gene 1): 0.617261
## epsilon (gene 1): 0.358998
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -3.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.1
## LStheta (batch 1): -3.1
## --------------------------------------------------------
## Iteration 520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 345.371
## delta (gene 1): 21.1494
## s (cell 1): 1.04898
## nu (cell 1): 1.06547
## theta (batch 1): 0.000921536
## betas:    1.4269  -0.1424   0.3177   0.3628   0.4370   1.0638   0.6683   1.0998   1.0923   0.7949  -(
##
## sigma: 0.161415
## lambda (gene 1): 1.36714
## epsilon (gene 1): 0.00926061
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -9
## LStheta (batch 1): -3
## --------------------------------------------------------
## Iteration 560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 446.776
## delta (gene 1): 12.7408
## s (cell 1): 1.13259
## nu (cell 1): 1.08943
## theta (batch 1): 0.000585684
## betas:    2.0492  -0.2762   0.0627  -0.1214   0.1241   0.4693   1.0861   0.5955   1.3586   0.5491  -(
##
## sigma: 0.171649
## lambda (gene 1): 0.749742
## epsilon (gene 1): 0.322012
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -8.9
## LStheta (batch 1): -2.9
## --------------------------------------------------------
## Iteration 600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 259.355
## delta (gene 1): 12.5488
## s (cell 1): 1.08008
## nu (cell 1): 1.08883
## theta (batch 1): 0.000224364
## betas:    1.6370  -0.2073   0.1802  -0.4826   0.4038   1.1185   0.5282   1.2225   1.0123   0.8223  -(
```

```
## 
## sigma: 0.188007
## lambda (gene 1): 1.50297
## epsilon (gene 1): -0.159744
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -8.8
## LStheta (batch 1): -2.8
## ---------------------------------------------------------
## Iteration 640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.878
## delta (gene 1): 17.4352
## s (cell 1): 1.00537
## nu (cell 1): 1.0439
## theta (batch 1): 0.000298212
## betas:    0.8806  -0.1145   0.2162   0.0541   1.0922   0.6822   1.4892   0.7925   1.4891   0.6575  -(
## 
## sigma: 0.178336
## lambda (gene 1): 0.650348
## epsilon (gene 1): 0.185225
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -8.8
## LStheta (batch 1): -2.8
## ---------------------------------------------------------
## Iteration 680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.124
## delta (gene 1): 15.0667
## s (cell 1): 1.10116
## nu (cell 1): 1.08539
## theta (batch 1): 0.000414751
## betas:    0.8647  -0.1401  -0.2292   0.4563   0.5407   1.1209   1.0942   1.2071   1.2573   0.8385  -(
## 
## sigma: 0.176095
## lambda (gene 1): 2.65632
## epsilon (gene 1): 0.299691
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -8.7
## LStheta (batch 1): -2.7
## ---------------------------------------------------------
## Iteration 720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 211.534
## delta (gene 1): 23.4551
## s (cell 1): 1.09675
## nu (cell 1): 1.10974
## theta (batch 1): 0.000965736
## betas:    1.6542  -0.0818   0.0514  -0.1282   0.9090   0.5657   0.7470   1.2054   0.5010   0.7252  -(
##
## sigma: 0.168074
## lambda (gene 1): 1.59353
## epsilon (gene 1): 0.631446
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -8.6
## LStheta (batch 1): -2.6
## -------------------------------------------------------
## Iteration 760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.681
## delta (gene 1): 13.7714
## s (cell 1): 1.10698
## nu (cell 1): 1.12431
## theta (batch 1): 0.00077209
## betas:    1.5598  -0.1800  -0.4698   0.2657   0.2847   0.8414   1.0076   0.7924   1.3625   0.5142  -(
##
## sigma: 0.177083
## lambda (gene 1): 0.902314
## epsilon (gene 1): -0.201077
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -8.5
## LStheta (batch 1): -2.5
## -------------------------------------------------------
## Iteration 800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 410.717
## delta (gene 1): 12.5836
## s (cell 1): 0.94875
## nu (cell 1): 0.976716
## theta (batch 1): 0.00266489
## betas:    1.3402  -0.1288   0.0526  -0.4682   0.6068   1.2538   0.6708   0.9923   1.3168   0.4057  -(
##
## sigma: 0.192255
## lambda (gene 1): 2.10097
## epsilon (gene 1): 0.220087
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.8
```

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## LSnu (cell 1): -8.4
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 461.745
## delta (gene 1): 11.5221
## s (cell 1): 1.07887
## nu (cell 1): 0.96103
## theta (batch 1): 0.00996107
## betas:    0.7892  -0.1138  -0.0123   0.0176   0.9589   1.3376   0.9606   1.0877   1.5041   0.6792  -(
##
## sigma: 0.173211
## lambda (gene 1): 0.312114
## epsilon (gene 1): 0.186499
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -8.4
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.48
## delta (gene 1): 15.6376
## s (cell 1): 1.07695
## nu (cell 1): 1.04661
## theta (batch 1): 0.0179205
## betas:    0.6068  -0.0553   0.0113   0.7523   0.3952   1.4137   0.9619   1.2226   1.3584   0.6631  -(
##
## sigma: 0.172169
## lambda (gene 1): 1.15064
## epsilon (gene 1): 0.138227
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -8.3
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 157.807
## delta (gene 1): 16.5286
## s (cell 1): 0.941562
## nu (cell 1): 1.13726
## theta (batch 1): 0.0324916
## betas:    1.1953  -0.1610  -0.3226   0.6800   0.0822   0.6534   1.6839   0.3702   1.6564   0.7669  -(
##
## sigma: 0.183388
```

```
## lambda (gene 1): 2.0182
## epsilon (gene 1): 0.192429
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -8.2
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.571
## delta (gene 1): 14.1023
## s (cell 1): 1.07479
## nu (cell 1): 1.04029
## theta (batch 1): 0.0536101
## betas:    1.1680  -0.1323   0.2069  -0.3366   1.2335   0.9252   1.1358   0.7121   1.4870   0.7054  -(
##
## sigma: 0.16833
## lambda (gene 1): 0.199049
## epsilon (gene 1): -0.182051
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -8.1
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 1000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 248.291
## delta (gene 1): 10.9611
## s (cell 1): 1.32335
## nu (cell 1): 0.979312
## theta (batch 1): 0.0307129
## betas:    1.1076  -0.2081   0.3715   0.0597  -0.2799   1.7250   0.9050   0.7551   1.7476   0.8995  -(
##
## sigma: 0.189153
## lambda (gene 1): 0.771465
## epsilon (gene 1): -0.345732
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -8
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 1040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.443
## delta (gene 1): 14.7619
```

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## s (cell 1): 0.997289
## nu (cell 1): 0.961311
## theta (batch 1): 0.0244619
## betas:    1.7454  -0.1887  -0.2543  -0.7657   1.0038   0.6258   0.7521   0.9426   1.0873   0.8137  -(
##
## sigma: 0.183211
## lambda (gene 1): 0.171802
## epsilon (gene 1): -0.0149774
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -8
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 1080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 392.151
## delta (gene 1): 15.5625
## s (cell 1): 1.53766
## nu (cell 1): 1.06359
## theta (batch 1): 0.066558
## betas:    1.6714  -0.1748  -0.0923  -0.1436  -0.1111   1.2926   0.6417   0.8808   1.2189   0.6402  -(
##
## sigma: 0.185796
## lambda (gene 1): 0.681307
## epsilon (gene 1): -0.180896
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -7.9
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 1120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 247.692
## delta (gene 1): 15.4796
## s (cell 1): 0.753296
## nu (cell 1): 0.979356
## theta (batch 1): 0.0155935
## betas:    1.3645  -0.2184  -0.0110  -0.2139   0.6973   0.5901   1.3051   0.6381   1.6943   0.6059  -(
##
## sigma: 0.175132
## lambda (gene 1): 0.941779
## epsilon (gene 1): -0.211862
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.8
## LStheta (batch 1): -2.2
```

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## --------------------------------------------------------
## Iteration 1160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 276.896
## delta (gene 1): 11.9361
## s (cell 1): 0.935179
## nu (cell 1): 1.04803
## theta (batch 1): 0.00982239
## betas:    1.5322  -0.2348  -0.8959  -0.3850   0.3148   1.2014   0.5462   1.2368   1.1014   1.0636  -(
##
## sigma: 0.180904
## lambda (gene 1): 1.28385
## epsilon (gene 1): -0.123512
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -7.7
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 1200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.707
## delta (gene 1): 11.7246
## s (cell 1): 0.952197
## nu (cell 1): 1.02564
## theta (batch 1): 0.00535769
## betas:    0.9639  -0.1589  -0.8126   0.3752   0.2781   1.1877   1.0966   0.9991   1.3209   1.1233  -(
##
## sigma: 0.191162
## lambda (gene 1): 1.20761
## epsilon (gene 1): -0.128056
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -7.6
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 1240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.948
## delta (gene 1): 13.3705
## s (cell 1): 1.18452
## nu (cell 1): 1.04428
## theta (batch 1): 0.0091258
## betas:    1.4086  -0.1166  -0.6459  -0.3852   0.7577   0.7667   1.0047   0.7870   1.2248   0.6696  -:
##
## sigma: 0.181465
## lambda (gene 1): 0.506622
## epsilon (gene 1): 0.0611243
```

```
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -7.6
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 1280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 117.614
## delta (gene 1): 14.6249
## s (cell 1): 1.06691
## nu (cell 1): 1.10452
## theta (batch 1): 0.00958926
## betas:    1.7376  -0.1426   0.2101  -0.0737   0.0973   1.2224   0.5320   0.7519   1.4068   0.2635  -(
##
## sigma: 0.175622
## lambda (gene 1): 0.511944
## epsilon (gene 1): -0.357259
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -7.5
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 1320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.295
## delta (gene 1): 13.349
## s (cell 1): 1.26338
## nu (cell 1): 1.03108
## theta (batch 1): 0.0231086
## betas:    1.1092  -0.0935   0.6295  -0.4188   0.4498   1.2816   1.1520   0.5629   1.6192   0.6494  -(
##
## sigma: 0.179085
## lambda (gene 1): 0.889739
## epsilon (gene 1): -0.328559
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 1360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.016
## delta (gene 1): 14.2964
## s (cell 1): 0.928093
## nu (cell 1): 1.04545
```

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## theta (batch 1): 0.0894467
## betas:      1.7197  -0.1358   0.0407   0.1470   0.6383   0.5515   1.0575   0.4981   1.4333   0.2852  -(
##
## sigma: 0.188897
## lambda (gene 1): 1.22394
## epsilon (gene 1): -0.229488
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -7.3
## LStheta (batch 1): -2.3
## -----------------------------------------------------------
## Iteration 1400 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.807
## delta (gene 1): 12.0441
## s (cell 1): 0.928265
## nu (cell 1): 1.13951
## theta (batch 1): 0.0800609
## betas:      1.0042  -0.0670   0.0286   0.4951   0.3928   1.2901   1.0543   0.8847   1.1148   0.9970  -(
##
## sigma: 0.199037
## lambda (gene 1): 0.491844
## epsilon (gene 1): -0.341715
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.2
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 1440 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 114.647
## delta (gene 1): 12.1681
## s (cell 1): 1.47971
## nu (cell 1): 1.04237
## theta (batch 1): 0.0457355
## betas:      1.3880  -0.1535  -0.3558  -0.3629   0.4362   0.9721   1.1554   0.7013   1.3837   0.5673  -(
##
## sigma: 0.178701
## lambda (gene 1): 1.59231
## epsilon (gene 1): -0.2921
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.2
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 1480 out of 40000 has been completed.
```

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## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 125.877
## delta (gene 1): 14.436
## s (cell 1): 0.846589
## nu (cell 1): 1.10809
## theta (batch 1): 0.0424223
## betas:    1.5962  -0.0561   0.0834  -0.0564   0.5295   0.8382   0.9438   0.6748   0.9377   0.5349  -(
##
## sigma: 0.182561
## lambda (gene 1): 1.03318
## epsilon (gene 1): -0.220631
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -7.1
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 1520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.59
## delta (gene 1): 15.7279
## s (cell 1): 0.920811
## nu (cell 1): 1.03128
## theta (batch 1): 0.0190868
## betas:    1.7731  -0.2395  -0.2444  -0.1332   0.3098   0.7514   0.9741   0.7304   1.3802   0.7008  -(
##
## sigma: 0.175627
## lambda (gene 1): 1.37239
## epsilon (gene 1): -0.0405082
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -7
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 1560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.593
## delta (gene 1): 14.4221
## s (cell 1): 1.09656
## nu (cell 1): 1.08051
## theta (batch 1): 0.0183544
## betas:    1.2892  -0.1794  -0.6860  -0.2787   0.9215   0.7307   1.3518   0.5912   1.6237   0.5696  -(
##
## sigma: 0.186012
## lambda (gene 1): 0.619066
## epsilon (gene 1): -0.00911928
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -6.9
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 1600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.606
## delta (gene 1): 15.2094
## s (cell 1): 0.929876
## nu (cell 1): 1.05464
## theta (batch 1): 0.0471027
## betas:     1.0909  -0.1770  -0.6064   0.0271   0.2682   1.3018   1.2307   0.3961   2.0869   0.4415  -(
##
## sigma: 0.188547
## lambda (gene 1): 1.72889
## epsilon (gene 1): -0.30022
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 1640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.676
## delta (gene 1): 18.4942
## s (cell 1): 1.05206
## nu (cell 1): 1.07556
## theta (batch 1): 0.0123233
## betas:     1.2052  -0.1145  -0.3754   0.5048   0.4039   1.2957   0.6518   1.1366   1.1024   0.8958  -(
##
## sigma: 0.170791
## lambda (gene 1): 1.79006
## epsilon (gene 1): -0.0732926
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 1680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.039
## delta (gene 1): 12.1651
## s (cell 1): 1.07979
## nu (cell 1): 1.04191
## theta (batch 1): 0.00385538
## betas:     1.2856  -0.2418  -0.4079   0.5079   0.2333   0.6939   1.2150   0.7879   1.6761   0.7812   (
```

```
## 
## sigma: 0.178245
## lambda (gene 1): 0.826206
## epsilon (gene 1): 0.150469
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -6.7
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 1720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.248
## delta (gene 1): 12.7587
## s (cell 1): 1.20357
## nu (cell 1): 1.09584
## theta (batch 1): 0.00416956
## betas:     1.3632   -0.1971   -0.1632   -0.3025   0.7472   1.0614   0.7387   0.8637   1.6454   0.5236   -(
## 
## sigma: 0.172307
## lambda (gene 1): 1.00118
## epsilon (gene 1): -0.246
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -6.6
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 1760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 142.591
## delta (gene 1): 17.4999
## s (cell 1): 0.905429
## nu (cell 1): 0.98914
## theta (batch 1): 0.00391679
## betas:     0.9274   -0.1804   -0.4353   -0.1435   0.4458   1.4586   0.7745   1.1636   1.6331   0.6190   (
## 
## sigma: 0.187804
## lambda (gene 1): 1.96209
## epsilon (gene 1): -0.300144
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -6.5
## LStheta (batch 1): -2.5
## --------------------------------------------------------
## Iteration 1800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 214.986
## delta (gene 1): 11.2381
## s (cell 1): 1.15727
## nu (cell 1): 1.08516
## theta (batch 1): 0.00919166
## betas:    1.2733  -0.1955   0.3110  -0.7958   0.7673   0.9475   0.9202   1.0714   1.1424   1.2124  -0
##
## sigma: 0.195625
## lambda (gene 1): 1.57277
## epsilon (gene 1): -0.203867
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.4
## LStheta (batch 1): -2.6
## ---------------------------------------------------------
## Iteration 1840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.208
## delta (gene 1): 16.4696
## s (cell 1): 0.947094
## nu (cell 1): 1.10373
## theta (batch 1): 0.00572872
## betas:    1.5058  -0.1228   0.2417   0.1326  -0.0752   1.1580   1.0228   0.6135   1.1991   0.8894  -0
##
## sigma: 0.177336
## lambda (gene 1): 1.36464
## epsilon (gene 1): 0.208402
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.4
## LStheta (batch 1): -2.6
## ---------------------------------------------------------
## Iteration 1880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.714
## delta (gene 1): 15.9088
## s (cell 1): 1.31141
## nu (cell 1): 1.087
## theta (batch 1): 0.0130952
## betas:    1.5372  -0.0491   0.1373  -0.0281   0.2080   0.8990   0.8053   1.0047   0.5318   1.1158  -
##
## sigma: 0.18053
## lambda (gene 1): 1.49222
## epsilon (gene 1): -0.325876
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
```

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## LSnu (cell 1): -6.3
## LStheta (batch 1): -2.5
## ---------------------------------------------------------
## Iteration 1920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.079
## delta (gene 1): 15.6585
## s (cell 1): 1.11031
## nu (cell 1): 1.10483
## theta (batch 1): 0.00755126
## betas:    1.5610  -0.1827  -0.7748  -0.4103   0.3453   1.0401   0.6988   0.9577   1.1931   0.8846  -(
##
## sigma: 0.175336
## lambda (gene 1): 1.43443
## epsilon (gene 1): -0.135167
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.2
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 1960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 281.886
## delta (gene 1): 19.7493
## s (cell 1): 0.855857
## nu (cell 1): 1.12178
## theta (batch 1): 0.0248458
## betas:    0.9583  -0.1536   0.0560   0.3820   0.2104   1.6867   0.5991   1.3056   1.1963   1.0957  -(
##
## sigma: 0.189249
## lambda (gene 1): 2.10338
## epsilon (gene 1): -0.088577
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -6.1
## LStheta (batch 1): -2.5
## ---------------------------------------------------------
## Iteration 2000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 232.011
## delta (gene 1): 21.9908
## s (cell 1): 0.974678
## nu (cell 1): 0.972195
## theta (batch 1): 0.0153868
## betas:    2.0019  -0.2111  -0.5787   0.2713  -0.2995   0.8810   0.8372   0.5800   1.1274   0.9743  -(
##
## sigma: 0.198475
```

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## lambda (gene 1): 0.853211
## epsilon (gene 1): 0.287421
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -6
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 2040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 136.155
## delta (gene 1): 14.8161
## s (cell 1): 1.17265
## nu (cell 1): 1.04711
## theta (batch 1): 0.0376199
## betas:    1.4181  -0.1658   0.5310  -0.0395   0.9570   0.8101   0.4767   1.5386   0.6469   1.2235  -(
##
## sigma: 0.18165
## lambda (gene 1): 0.841537
## epsilon (gene 1): -0.0856572
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -6
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 2080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.905
## delta (gene 1): 13.9795
## s (cell 1): 1.22421
## nu (cell 1): 1.08203
## theta (batch 1): 0.0274869
## betas:    1.4246  -0.1729   0.4632   0.4149  -0.1146   1.4323   0.7033   0.7309   1.5603   0.7154  -(
##
## sigma: 0.185877
## lambda (gene 1): 1.94844
## epsilon (gene 1): -0.139987
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 2120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.835
## delta (gene 1): 17.2685
```

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## s (cell 1): 1.50685
## nu (cell 1): 1.11381
## theta (batch 1): 0.0514322
## betas:    1.6213  -0.2399  -0.3773  -0.1594   0.3989   0.6302   1.1160   0.7022   1.4811   0.7795  -(
##
## sigma: 0.185248
## lambda (gene 1): 1.14978
## epsilon (gene 1): -0.0180954
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.8
## LStheta (batch 1): -2.4
## ------------------------------------------------------
## Iteration 2160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.44
## delta (gene 1): 16.2798
## s (cell 1): 1.26644
## nu (cell 1): 1.08545
## theta (batch 1): 0.0327361
## betas:    0.5168  -0.0294   0.2181  -0.0862   0.8308   1.7655   0.8792   1.0190   1.5645   0.5686  -(
##
## sigma: 0.184242
## lambda (gene 1): 1.60151
## epsilon (gene 1): -0.226534
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.7
## LStheta (batch 1): -2.3
## ------------------------------------------------------
## Iteration 2200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 293.421
## delta (gene 1): 20.319
## s (cell 1): 1.16195
## nu (cell 1): 1.15786
## theta (batch 1): 0.0033123
## betas:    1.3048  -0.1757  -0.7370   0.1322   0.5468   1.0320   0.8934   0.9921   1.1288   1.1444  -(
##
## sigma: 0.203027
## lambda (gene 1): 2.21245
## epsilon (gene 1): 0.0345189
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.6
## LStheta (batch 1): -2.2
```

```
## ---------------------------------------------------------
## Iteration 2240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.061
## delta (gene 1): 13.3527
## s (cell 1): 1.09343
## nu (cell 1): 1.04364
## theta (batch 1): 0.00566664
## betas:    1.1294  -0.1049   0.6197   0.0190   0.6098   1.1251   1.1084   0.7520   1.3900   0.7064  -(
##
## sigma: 0.195026
## lambda (gene 1): 1.77816
## epsilon (gene 1): -0.338945
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 2280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.969
## delta (gene 1): 18.4639
## s (cell 1): 1.30108
## nu (cell 1): 1.1686
## theta (batch 1): 0.0171235
## betas:    1.2940  -0.1983   0.5673   0.2569   0.0910   1.2559   0.9802   0.8454   1.4341   0.8996  -(
##
## sigma: 0.18438
## lambda (gene 1): 0.423195
## epsilon (gene 1): -0.326393
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.5
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 2320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.338
## delta (gene 1): 12.9918
## s (cell 1): 0.894617
## nu (cell 1): 1.08289
## theta (batch 1): 0.0138887
## betas:    0.7807  -0.2664  -0.0193   0.3318   0.7369   1.0135   1.0557   1.2646   1.6621   1.1714   (
##
## sigma: 0.174658
## lambda (gene 1): 2.12225
## epsilon (gene 1): -0.421945
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 2360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.076
## delta (gene 1): 14.1336
## s (cell 1): 1.08973
## nu (cell 1): 1.08192
## theta (batch 1): 0.00589694
## betas:    1.1168  -0.0979  -0.1225  -0.0511   1.0581   0.6566   1.1848   0.9616   1.0802   0.8546  -(
##
## sigma: 0.192593
## lambda (gene 1): 1.64167
## epsilon (gene 1): -0.151736
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 2400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 428.686
## delta (gene 1): 14.8347
## s (cell 1): 0.900988
## nu (cell 1): 1.04659
## theta (batch 1): 0.0170891
## betas:    1.1202  -0.0753   0.0803  -0.0745  -0.0535   1.6178   0.8249   0.7284   1.4480   0.6902  -(
##
## sigma: 0.196234
## lambda (gene 1): 0.442435
## epsilon (gene 1): 0.465209
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 2440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.611
## delta (gene 1): 11.6885
## s (cell 1): 0.901388
## nu (cell 1): 1.08001
```

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## theta (batch 1): 0.0174517
## betas:    0.6983  -0.1255  -0.6474  -0.0568   0.3352   1.4737   1.2203   0.7793   1.7959   0.7628   -(
##
## sigma: 0.177622
## lambda (gene 1): 0.283091
## epsilon (gene 1): 0.21168
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 2480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.689
## delta (gene 1): 10.522
## s (cell 1): 0.934309
## nu (cell 1): 1.12168
## theta (batch 1): 0.0122336
## betas:    1.5079  -0.1110   0.0350   0.0183   0.3993   1.1454   0.6415   0.8010   1.2829   0.5199   -(
##
## sigma: 0.178293
## lambda (gene 1): 1.16733
## epsilon (gene 1): -0.546113
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 2520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 296.451
## delta (gene 1): 12.226
## s (cell 1): 0.585849
## nu (cell 1): 0.958289
## theta (batch 1): 0.0578715
## betas:    1.6010  -0.1330  -0.3640   0.0175   0.3648   1.1314   0.7621   0.6857   1.2878   0.6332   -2
##
## sigma: 0.183757
## lambda (gene 1): 1.25115
## epsilon (gene 1): -0.339876
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 2560 out of 40000 has been completed.
```

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## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 161.153
## delta (gene 1): 11.4881
## s (cell 1): 1.3552
## nu (cell 1): 1.07764
## theta (batch 1): 0.044547
## betas:    1.6370  -0.2160  -0.4838   0.1310   0.3894   0.8400   0.6507   0.9273   1.4003   0.7037  -(
##
## sigma: 0.178118
## lambda (gene 1): 0.312677
## epsilon (gene 1): -0.520651
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 2600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 131.81
## delta (gene 1): 16.6135
## s (cell 1): 0.925746
## nu (cell 1): 1.05453
## theta (batch 1): 0.0376388
## betas:    1.4222  -0.1460  -0.5188   0.5609   0.4926   0.6643   1.4399   0.3630   1.4628   0.8957   -
##
## sigma: 0.204112
## lambda (gene 1): 2.52068
## epsilon (gene 1): -0.103435
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 2640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.708
## delta (gene 1): 11.7351
## s (cell 1): 1.26908
## nu (cell 1): 1.21755
## theta (batch 1): 0.0317299
## betas:    1.5155  -0.2439  -0.6443  -0.3587   0.9396   0.5809   1.0442   0.8531   1.5263   0.6872  -(
##
## sigma: 0.185653
## lambda (gene 1): 0.715495
## epsilon (gene 1): -0.406436
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 2680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 166.75
## delta (gene 1): 14.6307
## s (cell 1): 1.90981
## nu (cell 1): 1.07881
## theta (batch 1): 0.0916939
## betas:    1.2632  -0.1874   0.2308  -0.1119   0.2386   1.0901   0.9944   0.9135   1.4425   0.7223  -(
##
## sigma: 0.186393
## lambda (gene 1): 1.43456
## epsilon (gene 1): -0.00136789
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 2720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 313.599
## delta (gene 1): 12.9253
## s (cell 1): 1.00276
## nu (cell 1): 0.974725
## theta (batch 1): 0.0195922
## betas:    0.9723  -0.1136   0.4649  -0.3557   0.8038   1.0510   0.8379   1.1997   1.3312   0.6798  -(
##
## sigma: 0.182992
## lambda (gene 1): 1.86521
## epsilon (gene 1): -0.190763
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 2760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 221.631
## delta (gene 1): 12.3321
## s (cell 1): 0.997961
## nu (cell 1): 1.12186
## theta (batch 1): 0.0191965
## betas:    1.1105  -0.1664  -0.9723   0.0711   0.7616   1.1174   0.8706   1.1327   1.4455   0.3863   (
```

```
##
## sigma: 0.186157
## lambda (gene 1): 1.32696
## epsilon (gene 1): -0.0733144
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 2800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 367.339
## delta (gene 1): 14.8592
## s (cell 1): 1.06789
## nu (cell 1): 1.00915
## theta (batch 1): 0.00716673
## betas:    0.1540  -0.0314   0.9631  -0.5444   1.9285   0.9292   1.6966   0.6356   1.9453   0.7768  -(
##
## sigma: 0.217713
## lambda (gene 1): 1.26734
## epsilon (gene 1): 0.218596
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 2840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.738
## delta (gene 1): 12.5604
## s (cell 1): 1.27245
## nu (cell 1): 1.13028
## theta (batch 1): 0.0157888
## betas:    1.4055  -0.2085  -0.2419  -0.3618   0.1677   1.4572   0.3719   1.2718   1.2703   0.8611  -(
##
## sigma: 0.190582
## lambda (gene 1): 2.11338
## epsilon (gene 1): 0.0435442
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 2880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 278.92
## delta (gene 1): 15.3974
## s (cell 1): 1.10134
## nu (cell 1): 1.05494
## theta (batch 1): 0.0109192
## betas:    1.6250  -0.1523   0.2334   0.0514   0.4587   0.6746   1.0595   0.5554   1.4247   0.5215  -(
##
## sigma: 0.182096
## lambda (gene 1): 1.67115
## epsilon (gene 1): -0.271205
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 2920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.338
## delta (gene 1): 10.3291
## s (cell 1): 0.976411
## nu (cell 1): 0.994707
## theta (batch 1): 0.015415
## betas:    1.7850  -0.1355  -0.2104  -0.1780   0.5314   0.8479   0.5810   0.7768   1.3202   0.2146  -(
##
## sigma: 0.179821
## lambda (gene 1): 3.06702
## epsilon (gene 1): -0.366073
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 2960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.766
## delta (gene 1): 16.9808
## s (cell 1): 1.18718
## nu (cell 1): 1.11203
## theta (batch 1): 0.00796367
## betas:    1.4612  -0.2278  -0.8807   0.2760   0.6463   0.7188   1.1889   0.6878   1.4442   1.0825  -(
##
## sigma: 0.178691
## lambda (gene 1): 1.85406
## epsilon (gene 1): -0.135242
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.7
```

```
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 3000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.583
## delta (gene 1): 16.7075
## s (cell 1): 1.07442
## nu (cell 1): 1.00474
## theta (batch 1): 0.0304403
## betas:    1.4021  -0.1067  -0.2962  -0.1333  -0.0177   1.4977   0.9099   0.4127   1.6499   0.5227  -(
##
## sigma: 0.192944
## lambda (gene 1): 0.202741
## epsilon (gene 1): -0.110422
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 3040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.918
## delta (gene 1): 17.1504
## s (cell 1): 1.18851
## nu (cell 1): 1.08047
## theta (batch 1): 0.0213288
## betas:    1.1888  -0.1183   0.2262   0.1598   0.1089   1.7032   0.5144   1.0723   1.3645   0.6194  -(
##
## sigma: 0.189009
## lambda (gene 1): 1.77205
## epsilon (gene 1): -0.0731212
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 3080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.73
## delta (gene 1): 10.6802
## s (cell 1): 1.1368
## nu (cell 1): 1.06925
## theta (batch 1): 0.00774494
## betas:    1.0332  -0.1392  -0.3817  -0.5012   1.0317   1.1034   0.8651   1.1200   1.2825   0.9350  -(
##
## sigma: 0.190898
```

```
## lambda (gene 1): 0.722712
## epsilon (gene 1): -0.506348
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 3120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.507
## delta (gene 1): 16.4092
## s (cell 1): 1.06889
## nu (cell 1): 1.09684
## theta (batch 1): 0.0179325
## betas:    1.0772  -0.1305  -0.6727   0.7527   0.3993   0.5903   1.3222   0.8993   1.2081   1.1707  -(
##
## sigma: 0.181634
## lambda (gene 1): 1.13823
## epsilon (gene 1): -0.00797616
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 3160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.899
## delta (gene 1): 20.3386
## s (cell 1): 1.04332
## nu (cell 1): 1.06265
## theta (batch 1): 0.00934814
## betas:    1.6719  -0.1992  -0.6613   0.1669   0.2421   0.9920   0.8668   0.6902   1.4313   0.4966  -(
##
## sigma: 0.189229
## lambda (gene 1): 1.05191
## epsilon (gene 1): 0.246914
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 3200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.841
## delta (gene 1): 11.1623
```

```
## s (cell 1): 1.12755
## nu (cell 1): 1.18228
## theta (batch 1): 0.0128611
## betas:     1.3370   -0.1821   -0.1242   -0.5583    0.2714    1.2455    0.7547    1.0013    1.2060    1.0595   -(
##
## sigma: 0.190684
## lambda (gene 1): 2.07641
## epsilon (gene 1): -0.245467
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 3240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.722
## delta (gene 1): 17.8411
## s (cell 1): 1.11386
## nu (cell 1): 1.08125
## theta (batch 1): 0.0256983
## betas:     1.3810   -0.2252   -0.8642   -0.0011    0.8029    0.8298    0.8134    1.0371    1.4069    0.7877   (
##
## sigma: 0.184183
## lambda (gene 1): 1.89313
## epsilon (gene 1): 0.232261
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 3280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 219.602
## delta (gene 1): 14.0788
## s (cell 1): 1.17167
## nu (cell 1): 1.13252
## theta (batch 1): 0.0407338
## betas:     1.6701   -0.2295   -0.2022    0.1496    0.3617    0.7516    1.1357    0.6955    1.2381    1.0044   -(
##
## sigma: 0.181754
## lambda (gene 1): 1.44644
## epsilon (gene 1): -0.0788331
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
```

```
## ------------------------------------------------------
## Iteration 3320 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.409
## delta (gene 1): 17.4739
## s (cell 1): 0.786874
## nu (cell 1): 0.988532
## theta (batch 1): 0.0185389
## betas:    1.7528  -0.1340   0.2507  -0.2760  -0.1264   1.1143   0.8144   0.5821   1.2809   0.5173  -(
##
## sigma: 0.172616
## lambda (gene 1): 0.917579
## epsilon (gene 1): 0.425639
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 3360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 156.224
## delta (gene 1): 16.9258
## s (cell 1): 1.26516
## nu (cell 1): 1.16972
## theta (batch 1): 0.0170693
## betas:    0.8188  -0.2418   0.1980  -0.2897   0.6256   1.2538   0.9391   1.2521   1.6502   0.9981   (
##
## sigma: 0.190705
## lambda (gene 1): 1.13766
## epsilon (gene 1): 0.502995
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ------------------------------------------------------
## Iteration 3400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.264
## delta (gene 1): 12.0865
## s (cell 1): 0.904333
## nu (cell 1): 1.07519
## theta (batch 1): 0.0264926
## betas:    1.0580  -0.2498  -0.2073   0.3377   0.5188   0.8627   1.2162   1.0766   1.3853   1.3035  -(
##
## sigma: 0.197056
## lambda (gene 1): 1.70669
## epsilon (gene 1): -0.591059
```

```
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------
## Iteration 3440 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.813
## delta (gene 1): 18.7655
## s (cell 1): 1.08627
## nu (cell 1): 1.0835
## theta (batch 1): 0.025058
## betas:    1.5389  -0.2852  -0.3872  -0.4252   0.6685   0.9028   0.8151   1.0155   1.4530   0.9298  -0
##
## sigma: 0.185034
## lambda (gene 1): 1.20747
## epsilon (gene 1): -0.147628
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------
## Iteration 3480 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.459
## delta (gene 1): 15.4212
## s (cell 1): 0.993901
## nu (cell 1): 1.04045
## theta (batch 1): 0.0178269
## betas:    1.6828  -0.2655  -0.3179   0.1512  -0.2900   1.2278   0.6575   0.9639   1.3314   0.9240  -0
##
## sigma: 0.17755
## lambda (gene 1): 0.862097
## epsilon (gene 1): -0.133654
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------
## Iteration 3520 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.25
## delta (gene 1): 12.1576
## s (cell 1): 1.18631
## nu (cell 1): 1.02312
```

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## theta (batch 1): 0.0333517
## betas:    1.4321  -0.2164   0.1324   0.3036   0.3003   0.8651   0.8618   1.0699   1.2481   1.0015  -(
##
## sigma: 0.187115
## lambda (gene 1): 3.08907
## epsilon (gene 1): -0.217953
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 3560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 339.841
## delta (gene 1): 18.6836
## s (cell 1): 1.32189
## nu (cell 1): 0.9871
## theta (batch 1): 0.0155382
## betas:    1.7928  -0.1525  -0.4835   0.6617  -0.3565   1.2937   0.6570   0.5498   1.4711   0.3111  -(
##
## sigma: 0.175149
## lambda (gene 1): 1.17211
## epsilon (gene 1): 0.25785
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 3600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 136.304
## delta (gene 1): 11.1506
## s (cell 1): 1.04225
## nu (cell 1): 1.05404
## theta (batch 1): 0.00487896
## betas:    0.8536  -0.1548  -0.4108   0.1749   0.3059   1.1791   1.2145   0.8994   1.3650   1.3081  -(
##
## sigma: 0.197037
## lambda (gene 1): 1.27467
## epsilon (gene 1): -0.689748
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 3640 out of 40000 has been completed.
```

```
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 384.536
## delta (gene 1): 14.686
## s (cell 1): 0.939962
## nu (cell 1): 1.06975
## theta (batch 1): 0.0103109
## betas:    0.7918  -0.1250   0.7726  -0.5818   0.3370   1.4986   1.1682   0.9040   1.4439   1.1805  -(
##
## sigma: 0.177265
## lambda (gene 1): 1.07768
## epsilon (gene 1): -0.433068
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 3680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.407
## delta (gene 1): 15.0246
## s (cell 1): 1.22216
## nu (cell 1): 1.10822
## theta (batch 1): 0.0314565
## betas:    1.2518  -0.2139   0.3215  -0.2365   0.5720   1.0884   0.7772   1.1421   1.3794   0.7548  -(
##
## sigma: 0.183946
## lambda (gene 1): 0.771366
## epsilon (gene 1): -0.410304
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 3720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 135.665
## delta (gene 1): 15.1912
## s (cell 1): 0.969377
## nu (cell 1): 1.09402
## theta (batch 1): 0.0472403
## betas:    1.1462  -0.2328   0.1632  -0.7049   0.5880   1.3847   0.7000   1.0979   1.6550   0.8393  -(
##
## sigma: 0.186073
## lambda (gene 1): 0.744006
## epsilon (gene 1): -0.216655
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.2
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 3760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.411
## delta (gene 1): 11.1509
## s (cell 1): 1.11297
## nu (cell 1): 1.07084
## theta (batch 1): 0.0118436
## betas:    1.4816  -0.0563  -0.2535  -0.5118   0.7517   1.0554   0.6486   1.0442   0.7639   0.8452  -
##
## sigma: 0.186793
## lambda (gene 1): 1.11489
## epsilon (gene 1): -0.0562567
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.1
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 3800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 330.226
## delta (gene 1): 12.1877
## s (cell 1): 1.03033
## nu (cell 1): 1.07194
## theta (batch 1): 0.014372
## betas:    1.1583  -0.1153  -0.4684   0.0581   0.8174   1.0997   0.5575   1.2849   1.2317   0.3888
##
## sigma: 0.202158
## lambda (gene 1): 0.308325
## epsilon (gene 1): 0.024323
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.2
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 3840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.817
## delta (gene 1): 12.1003
## s (cell 1): 1.18951
## nu (cell 1): 1.01906
## theta (batch 1): 0.0220354
## betas:    0.9758  -0.0957   0.3407   0.0008   0.8522   1.0642   0.9603   0.9236   1.4970   0.5898  -
```

```
## 
## sigma: 0.180456
## lambda (gene 1): 1.30344
## epsilon (gene 1): 0.0257367
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.2
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 3880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.612
## delta (gene 1): 14.9475
## s (cell 1): 0.857315
## nu (cell 1): 1.07937
## theta (batch 1): 0.0261895
## betas:    1.4587  -0.1994   0.2964  -0.2271   0.4452   0.9033   0.8705   1.0884   1.1716   0.7829  -
## 
## sigma: 0.174407
## lambda (gene 1): 0.60228
## epsilon (gene 1): -0.0320327
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 3920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 427.081
## delta (gene 1): 14.8971
## s (cell 1): 1.19063
## nu (cell 1): 1.0813
## theta (batch 1): 0.0193775
## betas:    1.8774  -0.2345  -0.1569   0.3189  -0.0575   1.1271   0.4395   0.9010   1.3698   0.5449  -
## 
## sigma: 0.180159
## lambda (gene 1): 1.46171
## epsilon (gene 1): -0.323033
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.2
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 3960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 207.866
## delta (gene 1): 16.1522
## s (cell 1): 1.58987
## nu (cell 1): 1.0088
## theta (batch 1): 0.0541658
## betas:     1.4650  -0.1959   0.0379  -0.6037   0.6436   1.3453   0.6334   0.8626   1.4865   0.7428  -
##
## sigma: 0.185333
## lambda (gene 1): 1.57058
## epsilon (gene 1): -0.168689
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 4000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.044
## delta (gene 1): 15.0482
## s (cell 1): 0.918409
## nu (cell 1): 1.11871
## theta (batch 1): 0.00974615
## betas:     1.2727  -0.1408  -0.7534   0.5600  -0.0478   1.4405   0.8230   0.8262   1.3762   0.8762  -
##
## sigma: 0.204472
## lambda (gene 1): 2.1317
## epsilon (gene 1): -0.0657704
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 4040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.378
## delta (gene 1): 16.596
## s (cell 1): 1.28612
## nu (cell 1): 1.11851
## theta (batch 1): 0.0103604
## betas:     1.3566  -0.1543   0.1423  -0.5472   0.6257   1.3521   0.8153   0.7309   1.6026   0.3940  -
##
## sigma: 0.190865
## lambda (gene 1): 0.829931
## epsilon (gene 1): 0.0526464
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 4080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.96
## delta (gene 1): 11.667
## s (cell 1): 1.06636
## nu (cell 1): 1.03706
## theta (batch 1): 0.00573543
## betas:    1.5974  -0.1098  -0.1945  -0.7399   1.3281   0.6803   0.6064   1.0317   1.0363   0.5003  -(
##
## sigma: 0.180208
## lambda (gene 1): 0.41937
## epsilon (gene 1): -0.39569
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 4120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.433
## delta (gene 1): 17.0629
## s (cell 1): 1.01946
## nu (cell 1): 1.00043
## theta (batch 1): 0.0038067
## betas:    1.4009  -0.0947  -0.3258   0.4935   0.6276   0.7311   1.0336   0.9395   0.7840   1.2518  -
##
## sigma: 0.184923
## lambda (gene 1): 0.935868
## epsilon (gene 1): -0.0297551
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 4160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.403
## delta (gene 1): 14.9636
## s (cell 1): 1.11403
## nu (cell 1): 1.10972
## theta (batch 1): 0.00615619
## betas:    1.5823  -0.2287  -0.3361   0.3960  -0.0409   1.2247   0.6825   0.8063   1.5571   0.6792  -(
##
## sigma: 0.18031
```

```
## lambda (gene 1): 1.09557
## epsilon (gene 1): -0.0746022
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 4200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 127.202
## delta (gene 1): 15.9417
## s (cell 1): 0.967373
## nu (cell 1): 1.04431
## theta (batch 1): 0.00446503
## betas:    1.2228  -0.1653   0.1686   0.2551  -0.1412   1.5190   0.8213   0.8197   1.5523   0.6858  -(
##
## sigma: 0.18724
## lambda (gene 1): 0.440397
## epsilon (gene 1): -0.108201
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 4240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.757
## delta (gene 1): 11.4055
## s (cell 1): 1.3374
## nu (cell 1): 1.22633
## theta (batch 1): 0.00424294
## betas:    1.1457  -0.1588  -0.4858   0.4675   0.7687   0.9943   0.9497   0.9103   1.5056   0.7839  -(
##
## sigma: 0.182288
## lambda (gene 1): 0.804246
## epsilon (gene 1): -0.428681
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 4280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.058
## delta (gene 1): 14.1506
```

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## s (cell 1): 1.12199
## nu (cell 1): 1.01415
## theta (batch 1): 0.0205418
## betas:    1.6724  -0.2328  -0.2004  -0.1086   0.6410   0.6446   1.2321   0.4132   1.8148   0.2533  -(
##
## sigma: 0.179258
## lambda (gene 1): 1.4726
## epsilon (gene 1): -0.144984
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ------------------------------------------------------
## Iteration 4320 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.572
## delta (gene 1): 14.8568
## s (cell 1): 0.983546
## nu (cell 1): 1.07157
## theta (batch 1): 0.00463266
## betas:    1.4772  -0.2596   0.2372  -0.2483   0.8519   0.8901   0.6031   1.2233   1.2722   1.1275  -(
##
## sigma: 0.192667
## lambda (gene 1): 1.61755
## epsilon (gene 1): -0.0301806
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 4360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.249
## delta (gene 1): 14.8638
## s (cell 1): 1.13596
## nu (cell 1): 1.0802
## theta (batch 1): 0.0189538
## betas:    1.2201  -0.1834   0.7438   0.2536   0.1563   1.6592   0.4706   1.2029   1.4200   0.6274  -(
##
## sigma: 0.178732
## lambda (gene 1): 1.03223
## epsilon (gene 1): -0.442201
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
```

```
## ----------------------------------------------------------
## Iteration 4400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.648
## delta (gene 1): 14.5578
## s (cell 1): 1.0769
## nu (cell 1): 1.09229
## theta (batch 1): 0.0271584
## betas:    1.4428  -0.2333   0.1877  -0.0363   1.0031   0.6135   0.9813   0.9716   1.4251   0.8184  -0
##
## sigma: 0.200885
## lambda (gene 1): 0.503495
## epsilon (gene 1): -0.5414
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 4440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.402
## delta (gene 1): 15.5942
## s (cell 1): 1.09056
## nu (cell 1): 1.10983
## theta (batch 1): 0.0229672
## betas:    1.5977  -0.1832   0.3409  -0.2186   0.5089   0.7648   0.9373   0.7826   1.4499   0.3901  -0
##
## sigma: 0.171993
## lambda (gene 1): 0.945798
## epsilon (gene 1): -0.467686
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 4480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 140.884
## delta (gene 1): 21.4851
## s (cell 1): 0.996702
## nu (cell 1): 1.08375
## theta (batch 1): 0.020081
## betas:    1.0252  -0.0644   0.8873   0.6996   0.4463   1.2292   0.8746   1.0615   1.2288   0.5546  -0
##
## sigma: 0.174832
## lambda (gene 1): 0.52927
## epsilon (gene 1): 0.550101
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 4520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.053
## delta (gene 1): 16.6519
## s (cell 1): 0.975892
## nu (cell 1): 1.02912
## theta (batch 1): 0.0157103
## betas:    1.3823  -0.1153   0.3065   0.0894   0.7726   0.9997   0.5973   1.1071   1.1521   0.6084  -(
##
## sigma: 0.188901
## lambda (gene 1): 0.633673
## epsilon (gene 1): -0.121381
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 4560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.842
## delta (gene 1): 17.1366
## s (cell 1): 1.02319
## nu (cell 1): 1.03951
## theta (batch 1): 0.00909845
## betas:    1.7423  -0.1154  -0.1182  -0.5742   0.4998   0.8975   0.8584   0.5891   1.2385   0.3975  -(
##
## sigma: 0.190141
## lambda (gene 1): 1.50369
## epsilon (gene 1): 0.00580739
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 4600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.189
## delta (gene 1): 11.1278
## s (cell 1): 1.18053
## nu (cell 1): 1.16037
```

```
## theta (batch 1): 0.00599352
## betas:    1.1687  -0.1040   0.5361  -0.1168   0.5785   0.7924   1.2188   0.7268   1.3702   0.5435  -(
##
## sigma: 0.200392
## lambda (gene 1): 0.290305
## epsilon (gene 1): -0.244065
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 4640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 316.994
## delta (gene 1): 13.4627
## s (cell 1): 0.915138
## nu (cell 1): 0.994877
## theta (batch 1): 0.00949011
## betas:    1.1151  -0.2909  -0.1637  -0.7730   0.8651   0.9317   0.9842   1.0750   1.8311   0.7748  (
##
## sigma: 0.188253
## lambda (gene 1): 1.39947
## epsilon (gene 1): -0.0167517
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 4680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.683
## delta (gene 1): 16.2623
## s (cell 1): 0.997228
## nu (cell 1): 0.993049
## theta (batch 1): 0.018971
## betas:    1.7972  -0.1870  -0.4048  -0.3451   0.9660   0.7720   0.5424   0.9625   1.2386   0.4004  -(
##
## sigma: 0.177191
## lambda (gene 1): 1.12118
## epsilon (gene 1): -0.030893
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 4720 out of 40000 has been completed.
```

```
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.827
## delta (gene 1): 17.5754
## s (cell 1): 0.804993
## nu (cell 1): 1.15228
## theta (batch 1): 0.0471205
## betas:    1.1547  -0.0914   0.2274  -0.3894   0.5923   1.4426   0.6502   0.9711   1.3502   0.4690  -(
##
## sigma: 0.175812
## lambda (gene 1): 0.394743
## epsilon (gene 1): 0.0866327
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 4760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.168
## delta (gene 1): 12.3212
## s (cell 1): 0.867355
## nu (cell 1): 0.962016
## theta (batch 1): 0.0455983
## betas:    0.6297  -0.0923  -0.4670  -0.0148   1.2724   1.2563   1.1473   0.9690   1.4942   0.7218  -(
##
## sigma: 0.180756
## lambda (gene 1): 0.73779
## epsilon (gene 1): -0.115174
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 4800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.512
## delta (gene 1): 13.1304
## s (cell 1): 0.878332
## nu (cell 1): 1.12249
## theta (batch 1): 0.020959
## betas:    0.8401  -0.1582  -0.4239  -0.1055   0.5482   1.5180   0.8435   1.1439   1.4706   0.8957  -(
##
## sigma: 0.198654
## lambda (gene 1): 1.71926
## epsilon (gene 1): -0.109015
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 4840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.775
## delta (gene 1): 16.4445
## s (cell 1): 1.30042
## nu (cell 1): 1.12185
## theta (batch 1): 0.0165694
## betas:    0.7900  -0.1486  -0.3249  -0.1947   1.2042   0.9364   1.0887   1.1078   1.5221   0.8117  -(
##
## sigma: 0.190852
## lambda (gene 1): 0.896942
## epsilon (gene 1): 0.134857
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 4880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.707
## delta (gene 1): 15.6405
## s (cell 1): 1.12158
## nu (cell 1): 1.08003
## theta (batch 1): 0.0275613
## betas:    1.3830  -0.1940   0.0478   0.4196   0.5789   0.6054   0.9817   0.8500   1.5440   0.5769  -(
##
## sigma: 0.189475
## lambda (gene 1): 1.11117
## epsilon (gene 1): 0.175704
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 4920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.126
## delta (gene 1): 15.0833
## s (cell 1): 1.07791
## nu (cell 1): 1.06289
## theta (batch 1): 0.0119029
## betas:    1.7587  -0.1362   0.2677  -0.4186   0.3250   0.5735   1.1319   0.4235   1.3774   0.4878  -(
```

```
##
## sigma: 0.182756
## lambda (gene 1): 0.921237
## epsilon (gene 1): 0.109649
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 4960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.048
## delta (gene 1): 15.0159
## s (cell 1): 1.12364
## nu (cell 1): 1.16045
## theta (batch 1): 0.0050427
## betas:    1.5632  -0.1769  -0.0221   0.3122  -0.1607   1.0941   0.6438   1.0190   1.2361   0.5873  -(
##
## sigma: 0.174681
## lambda (gene 1): 1.97362
## epsilon (gene 1): -0.0151273
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 5000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.782
## delta (gene 1): 13.4516
## s (cell 1): 0.943825
## nu (cell 1): 1.01277
## theta (batch 1): 0.00384604
## betas:    1.7688  -0.2213   0.3243  -0.5739   0.4503   0.4766   1.0281   0.6675   1.2934   0.8194  -(
##
## sigma: 0.19819
## lambda (gene 1): 0.765566
## epsilon (gene 1): -0.0409166
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 5040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 110.242
## delta (gene 1): 12.4608
## s (cell 1): 1.23833
## nu (cell 1): 1.13395
## theta (batch 1): 0.00578572
## betas:    1.5015  -0.1212  -0.3130   0.7540   0.4935   0.3739   1.0857   0.9490   0.9172   0.9102  -0
##
## sigma: 0.190035
## lambda (gene 1): 1.72266
## epsilon (gene 1): -0.109677
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 5080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 147.526
## delta (gene 1): 12.7947
## s (cell 1): 0.954858
## nu (cell 1): 1.05082
## theta (batch 1): 0.00382785
## betas:    1.6989  -0.2386   0.3988  -0.0103  -0.2201   1.1385   0.9546   0.5792   1.6244   0.4828
##
## sigma: 0.178321
## lambda (gene 1): 0.518566
## epsilon (gene 1): 0.0561283
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 5120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 301
## delta (gene 1): 13.0772
## s (cell 1): 0.949455
## nu (cell 1): 1.03327
## theta (batch 1): 0.00246782
## betas:    1.6461  -0.2222   0.2446  -0.1888   0.1952   0.8647   0.9588   0.6246   1.5375   0.7279  -0
##
## sigma: 0.179138
## lambda (gene 1): 0.897355
## epsilon (gene 1): -0.346276
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
```

```
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 5160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 372.616
## delta (gene 1): 18.7684
## s (cell 1): 1.09672
## nu (cell 1): 1.09271
## theta (batch 1): 0.000923622
## betas:    1.6412  -0.1929  -0.8855   0.4701  -0.0159   0.9068   0.7964   0.9586   0.9727   1.1966  -(
##
## sigma: 0.18321
## lambda (gene 1): 0.373736
## epsilon (gene 1): 0.036002
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 5200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.502
## delta (gene 1): 14.9594
## s (cell 1): 1.08257
## nu (cell 1): 1.03308
## theta (batch 1): 0.00174338
## betas:    1.6950  -0.2540  -0.8105  -0.0217   0.1087   0.8551   0.7223   0.9372   1.2544   1.0344  -(
##
## sigma: 0.199802
## lambda (gene 1): 0.379932
## epsilon (gene 1): -0.169014
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 5240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.448
## delta (gene 1): 13.7347
## s (cell 1): 1.13596
## nu (cell 1): 1.10076
## theta (batch 1): 0.00270744
## betas:    0.9462  -0.0978   0.6902   0.2296   0.3653   1.2242   0.9881   0.9062   1.3538   1.1051  -1
##
## sigma: 0.180755
```

```
## lambda (gene 1): 1.07127
## epsilon (gene 1): -0.257145
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 5280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.37
## delta (gene 1): 13.245
## s (cell 1): 1.22056
## nu (cell 1): 1.03546
## theta (batch 1): 0.00543775
## betas:    1.7575  -0.2310  -0.5489  -0.4131   0.4570   1.0219   0.5975   0.7625   1.5199   0.6112  -(
##
## sigma: 0.187511
## lambda (gene 1): 0.29548
## epsilon (gene 1): -0.327592
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 5320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.345
## delta (gene 1): 15.0808
## s (cell 1): 1.11576
## nu (cell 1): 1.09882
## theta (batch 1): 0.0011385
## betas:    1.3948  -0.1991  -0.1093   0.0287   0.0968   1.5521   0.3736   1.1756   1.4141   0.5675  -(
##
## sigma: 0.187348
## lambda (gene 1): 1.57276
## epsilon (gene 1): 0.0921015
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 5360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.175
## delta (gene 1): 13.5125
```

```
## s (cell 1): 1.06279
## nu (cell 1): 1.13537
## theta (batch 1): 0.000886789
## betas:    0.9490  -0.1818  -0.0673  -0.4864   0.8057   0.9077   1.1725   0.7736   1.8651   0.6418  (
##
## sigma: 0.174515
## lambda (gene 1): 1.49563
## epsilon (gene 1): -0.489195
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 5400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 145.29
## delta (gene 1): 13.7845
## s (cell 1): 1.0131
## nu (cell 1): 1.03641
## theta (batch 1): 0.0022968
## betas:    1.3936  -0.1938  -0.6605   0.2563   0.4835   0.8878   0.9301   1.1191   0.9052   1.3688  -(
##
## sigma: 0.202585
## lambda (gene 1): 1.39533
## epsilon (gene 1): -0.533497
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 5440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 398.26
## delta (gene 1): 15.0587
## s (cell 1): 1.05186
## nu (cell 1): 1.01535
## theta (batch 1): 0.00471174
## betas:    1.8415  -0.2245  -0.1853   0.5522  -0.1140   0.8044   0.9950   0.5930   1.4274   0.4616  -(
##
## sigma: 0.189783
## lambda (gene 1): 0.962627
## epsilon (gene 1): -0.42915
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
```

```
## --------------------------------------------------------
## Iteration 5480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.999
## delta (gene 1): 12.8279
## s (cell 1): 1.10482
## nu (cell 1): 1.06841
## theta (batch 1): 0.00486062
## betas:   1.0773  -0.1023  -0.0783   0.2797   0.8887   1.3855   0.4520   1.4336   1.0138   0.5436  -(
##
## sigma: 0.185175
## lambda (gene 1): 1.2234
## epsilon (gene 1): -0.131735
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 5520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.232
## delta (gene 1): 14.0555
## s (cell 1): 1.03706
## nu (cell 1): 1.02673
## theta (batch 1): 0.00265658
## betas:   1.5950  -0.2056   0.0608  -0.4687   0.5219   0.7567   0.9150   0.9240   1.1245   0.9953  -(
##
## sigma: 0.183389
## lambda (gene 1): 0.97418
## epsilon (gene 1): 0.236115
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 5560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.323
## delta (gene 1): 12.5257
## s (cell 1): 1.04763
## nu (cell 1): 1.01914
## theta (batch 1): 0.00200408
## betas:   1.0273  -0.0827   0.0606   0.4889   0.6822   0.7106   1.1259   1.1243   1.0081   1.0004  -(
##
## sigma: 0.191898
## lambda (gene 1): 1.4902
## epsilon (gene 1): -0.137115
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 5600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.242
## delta (gene 1): 17.5568
## s (cell 1): 1.0705
## nu (cell 1): 1.03122
## theta (batch 1): 0.00370949
## betas:    1.0819  -0.1213   0.1436   0.4062   0.7198   1.1254   0.6857   1.3125   1.0767   0.7825  -(
##
## sigma: 0.200571
## lambda (gene 1): 0.603661
## epsilon (gene 1): -0.0881387
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 5640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.744
## delta (gene 1): 14.4256
## s (cell 1): 1.22907
## nu (cell 1): 1.14327
## theta (batch 1): 0.00511386
## betas:    1.2499  -0.1698   0.4654   0.1156   0.6155   0.9734   0.7896   1.2919   0.9774   1.0556  -(
##
## sigma: 0.181556
## lambda (gene 1): 0.405845
## epsilon (gene 1): -0.270634
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 5680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.663
## delta (gene 1): 16.2081
## s (cell 1): 1.08366
## nu (cell 1): 1.03357
```

```
## theta (batch 1): 0.00313237
## betas:    1.7771  -0.2492  -0.7086  -0.7176   0.8419   0.3847   0.8075   1.1914   0.8451   1.2934  -(
##
## sigma: 0.190818
## lambda (gene 1): 0.687932
## epsilon (gene 1): -0.0128605
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ------------------------------------------------------------
## Iteration 5720 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 138.065
## delta (gene 1): 17.9678
## s (cell 1): 0.974037
## nu (cell 1): 0.987975
## theta (batch 1): 0.00444419
## betas:    1.5562  -0.2592  -0.2037  -0.0391  -0.2378   0.9143   1.2404   0.4908   1.7558   0.6501  -(
##
## sigma: 0.185646
## lambda (gene 1): 1.06511
## epsilon (gene 1): -0.0737831
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 5760 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.889
## delta (gene 1): 15.7833
## s (cell 1): 1.10377
## nu (cell 1): 1.03461
## theta (batch 1): 0.011269
## betas:    1.4044  -0.1517  -0.7798   0.3660   0.4174   1.2772   0.7256   0.8680   1.3825   0.5604  -(
##
## sigma: 0.189043
## lambda (gene 1): 0.736704
## epsilon (gene 1): -0.27562
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ------------------------------------------------------------
## Iteration 5800 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.755
## delta (gene 1): 13.8892
## s (cell 1): 1.08414
## nu (cell 1): 1.02879
## theta (batch 1): 0.00227746
## betas:    1.3892  -0.1770   0.0539  -0.1551   0.3192   0.8943   0.8557   1.0487   1.1006   1.0823  -(
##
## sigma: 0.196329
## lambda (gene 1): 1.39612
## epsilon (gene 1): -0.543148
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 5840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.505
## delta (gene 1): 18.8015
## s (cell 1): 1.14243
## nu (cell 1): 1.10537
## theta (batch 1): 0.00213765
## betas:    1.0141  -0.1786   0.0899   0.4474   0.5951   0.6026   1.2082   0.9851   1.5649   0.8106  -(
##
## sigma: 0.170706
## lambda (gene 1): 0.710189
## epsilon (gene 1): -0.246226
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 5880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 296.304
## delta (gene 1): 15.2714
## s (cell 1): 0.98583
## nu (cell 1): 1.03052
## theta (batch 1): 0.00132081
## betas:    1.5821  -0.2497  -0.2103   0.5044  -0.3538   0.8648   0.6511   0.9744   1.5419   0.7064  -(
##
## sigma: 0.193536
## lambda (gene 1): 0.872871
## epsilon (gene 1): -0.45723
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 5920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.419
## delta (gene 1): 15.2609
## s (cell 1): 1.31885
## nu (cell 1): 1.1968
## theta (batch 1): 0.00507212
## betas:    1.1454  -0.1812  -0.1852   0.3638   0.7031   0.9785   0.9561   1.0682   1.5105   0.4951
##
## sigma: 0.179526
## lambda (gene 1): 0.209542
## epsilon (gene 1): 0.131929
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 5960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 153.953
## delta (gene 1): 16.7966
## s (cell 1): 1.18922
## nu (cell 1): 1.15422
## theta (batch 1): 0.00170027
## betas:    1.5713  -0.2046   0.3517   0.3285   0.2233   1.3900   0.5334   0.8796   1.6773   0.1252
##
## sigma: 0.190798
## lambda (gene 1): 0.985765
## epsilon (gene 1): -0.0643131
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 6000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.733
## delta (gene 1): 15.0456
## s (cell 1): 0.972541
## nu (cell 1): 1.04538
## theta (batch 1): 0.00438995
## betas:    1.5003  -0.1639  -0.1170   0.7762  -0.2224   1.1284   0.9738   0.5813   1.5004   0.7351
```

```
## 
## sigma: 0.197663
## lambda (gene 1): 0.807486
## epsilon (gene 1): -0.311876
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 6040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.353
## delta (gene 1): 19.0025
## s (cell 1): 1.15078
## nu (cell 1): 1.16696
## theta (batch 1): 0.00119757
## betas:    1.8807  -0.2814  -0.4080   0.0404   0.1941   0.1123   1.4896   0.3275   1.7276   0.4789  (
## 
## sigma: 0.183616
## lambda (gene 1): 1.01551
## epsilon (gene 1): -0.0393095
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 6080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.756
## delta (gene 1): 12.5259
## s (cell 1): 1.07597
## nu (cell 1): 1.06341
## theta (batch 1): 0.00101283
## betas:    1.3074  -0.1458  -0.1626   1.0246   0.4654   0.9413   0.7624   1.2437   0.8254   1.2599  -(
## 
## sigma: 0.188038
## lambda (gene 1): 0.538479
## epsilon (gene 1): -0.608557
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 6120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 201.39
## delta (gene 1): 14.3902
## s (cell 1): 1.13565
## nu (cell 1): 1.10234
## theta (batch 1): 0.000676336
## betas:    1.1957  -0.2131  -0.0561  -0.2096   0.3485   0.7829   1.2057   0.8421   1.5370   0.9715  -(
##
## sigma: 0.176083
## lambda (gene 1): 0.520966
## epsilon (gene 1): -0.0567705
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 6160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 287.796
## delta (gene 1): 14.3611
## s (cell 1): 1.0593
## nu (cell 1): 1.05298
## theta (batch 1): 0.00226371
## betas:    1.1237  -0.2029  -0.1097  -0.2200   1.1126   0.7331   1.0341   1.0009   1.5323   0.7761  -(
##
## sigma: 0.174985
## lambda (gene 1): 0.511644
## epsilon (gene 1): -0.132475
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 6200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.79
## delta (gene 1): 12.5164
## s (cell 1): 1.12807
## nu (cell 1): 1.12974
## theta (batch 1): 0.00181191
## betas:    1.2777  -0.1727  -0.3835   0.6320  -0.0738   1.1112   1.2523   0.5125   1.5890   1.0251  -(
##
## sigma: 0.18922
## lambda (gene 1): 0.369046
## epsilon (gene 1): -0.4254
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 6240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 130.071
## delta (gene 1): 19.5309
## s (cell 1): 1.25725
## nu (cell 1): 1.13199
## theta (batch 1): 0.00482059
## betas:     1.1096  -0.0771   0.5441   0.3063   0.9494   0.8311   1.0666   0.7435   1.4922   0.5333  -(
##
## sigma: 0.175132
## lambda (gene 1): 1.80307
## epsilon (gene 1): 0.0587101
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 6280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.877
## delta (gene 1): 15.1189
## s (cell 1): 1.05837
## nu (cell 1): 1.12625
## theta (batch 1): 0.00303229
## betas:     1.7562  -0.1365   0.1050  -0.3479   0.3204   0.8617   0.9863   0.3840   1.4689   0.4137  -(
##
## sigma: 0.177294
## lambda (gene 1): 1.23588
## epsilon (gene 1): -0.271163
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 6320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 157.728
## delta (gene 1): 17.0523
## s (cell 1): 1.47672
## nu (cell 1): 1.02335
## theta (batch 1): 0.0149299
## betas:     0.9791  -0.0988  -0.3007   0.3051   0.0538   1.6572   1.0448   0.6603   1.6578   0.5628  -(
##
## sigma: 0.191081
```

```
## lambda (gene 1): 1.70229
## epsilon (gene 1): -0.0928124
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 6360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 199.174
## delta (gene 1): 15.8873
## s (cell 1): 0.923607
## nu (cell 1): 1.0629
## theta (batch 1): 0.0296879
## betas:    1.3671  -0.1823  -0.3953   0.6204   0.1873   1.0781   0.9625   0.7975   1.5264   0.5372  -(
##
## sigma: 0.181551
## lambda (gene 1): 1.73208
## epsilon (gene 1): -0.136461
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 6400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 259.793
## delta (gene 1): 12.156
## s (cell 1): 1.11738
## nu (cell 1): 1.11758
## theta (batch 1): 0.029014
## betas:    1.6819  -0.2047  -0.4784   0.6691  -0.1313   0.8133   1.1310   0.5348   1.3566   0.8699  -(
##
## sigma: 0.19701
## lambda (gene 1): 0.993986
## epsilon (gene 1): -0.274234
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 6440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.517
## delta (gene 1): 17.1338
```

```
## s (cell 1): 1.24469
## nu (cell 1): 1.02938
## theta (batch 1): 0.0226165
## betas:    1.5042  -0.2019  -0.5687   0.2891   0.7299   0.4925   1.2137   0.6307   1.6314   0.5058  -(
##
## sigma: 0.186595
## lambda (gene 1): 0.586251
## epsilon (gene 1): 0.111846
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 6480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.738
## delta (gene 1): 11.8379
## s (cell 1): 1.10615
## nu (cell 1): 1.11069
## theta (batch 1): 0.0162722
## betas:    1.6763  -0.1779  -0.1433   0.3636   0.0449   0.9482   0.8752   0.6646   1.3450   0.7259  -(
##
## sigma: 0.172776
## lambda (gene 1): 0.873803
## epsilon (gene 1): -0.503722
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 6520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.025
## delta (gene 1): 14.4272
## s (cell 1): 0.766781
## nu (cell 1): 1.13902
## theta (batch 1): 0.0459756
## betas:    1.1199  -0.2656   0.4919   0.1423  -0.0476   1.2881   0.7486   1.1914   1.7197   0.7374   (
##
## sigma: 0.187275
## lambda (gene 1): 1.32348
## epsilon (gene 1): -0.202676
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
```

```
## ----------------------------------------------------------
## Iteration 6560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 89.1763
## delta (gene 1): 13.1315
## s (cell 1): 1.94581
## nu (cell 1): 1.12365
## theta (batch 1): 0.137558
## betas:    1.0621  -0.1785  -0.0014  -0.3246   0.9109   1.0810   0.8330   1.1968   1.4193   0.6025   (
##
## sigma: 0.18298
## lambda (gene 1): 0.861649
## epsilon (gene 1): -0.090655
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 6600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 305.274
## delta (gene 1): 18.7544
## s (cell 1): 0.991958
## nu (cell 1): 1.00227
## theta (batch 1): 0.0479937
## betas:    1.0660  -0.1665  -0.3141  -0.3422   0.6256   1.0414   0.8931   1.1914   1.0517   1.4273   -(
##
## sigma: 0.213765
## lambda (gene 1): 0.87666
## epsilon (gene 1): -0.0850383
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 6640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 124.521
## delta (gene 1): 15.1694
## s (cell 1): 0.964769
## nu (cell 1): 1.08082
## theta (batch 1): 0.0477958
## betas:    1.0302  -0.1462  -0.0616  -0.3269   0.8345   0.8751   1.3845   0.6862   1.5243   1.0074   -(
##
## sigma: 0.186998
## lambda (gene 1): 1.28879
## epsilon (gene 1): -0.301704
```

```
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 6680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 280.561
## delta (gene 1): 10.4767
## s (cell 1): 1.08828
## nu (cell 1): 1.06805
## theta (batch 1): 0.0523816
## betas:    1.8064  -0.2052   0.0920   0.1690   0.5290   0.4701   1.0059   0.8694   0.8801   1.1551  -(
##
## sigma: 0.186773
## lambda (gene 1): 0.83177
## epsilon (gene 1): -0.795327
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 6720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.27
## delta (gene 1): 15.0479
## s (cell 1): 0.990957
## nu (cell 1): 1.0238
## theta (batch 1): 0.0136926
## betas:    1.3097  -0.1326   1.1091  -0.2037   0.7086   1.1270   0.7208   0.8282   1.4863   0.6006  -(
##
## sigma: 0.187534
## lambda (gene 1): 1.10864
## epsilon (gene 1): 0.299762
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 6760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.522
## delta (gene 1): 14.7745
## s (cell 1): 0.98763
## nu (cell 1): 1.04362
```

```
## theta (batch 1): 0.00348804
## betas:    1.1257  -0.1269  -0.9241   0.1482   0.5400   1.1652   0.9350   0.8760   1.3510   1.0283   -(
##
## sigma: 0.176551
## lambda (gene 1): 1.15639
## epsilon (gene 1): -0.287278
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 6800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.672
## delta (gene 1): 17.947
## s (cell 1): 1.12243
## nu (cell 1): 1.03928
## theta (batch 1): 0.00194525
## betas:    0.9119  -0.1196  -0.0306  -0.1978   0.8384   1.0671   1.2424   0.6119   1.8839   0.4439   -(
##
## sigma: 0.200698
## lambda (gene 1): 0.678422
## epsilon (gene 1): 0.39912
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 6840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 282.165
## delta (gene 1): 10.2895
## s (cell 1): 1.09589
## nu (cell 1): 1.03523
## theta (batch 1): 0.0047769
## betas:    0.9026  -0.1448   0.0247  -0.0228   0.4167   0.9190   1.5049   0.6075   1.7090   0.8066   -(
##
## sigma: 0.18921
## lambda (gene 1): 0.564911
## epsilon (gene 1): -0.135456
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 6880 out of 40000 has been completed.
```

```
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 213.504
## delta (gene 1): 16.0033
## s (cell 1): 1.23639
## nu (cell 1): 1.03999
## theta (batch 1): 0.0235286
## betas:    1.7555  -0.1995  -1.2073   0.3873   0.5757   0.4829   0.9404   0.9727   0.9607   0.8910  -(
##
## sigma: 0.182185
## lambda (gene 1): 2.9187
## epsilon (gene 1): 0.343569
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 6920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.143
## delta (gene 1): 14.2927
## s (cell 1): 1.07931
## nu (cell 1): 1.08456
## theta (batch 1): 0.0231961
## betas:    1.5373  -0.2367  -0.3991  -0.3257   0.4918   0.6252   1.2592   0.5037   1.7392   0.6364  -(
##
## sigma: 0.167021
## lambda (gene 1): 1.54735
## epsilon (gene 1): 0.184794
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 6960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.478
## delta (gene 1): 15.4555
## s (cell 1): 0.880373
## nu (cell 1): 0.992978
## theta (batch 1): 0.0127291
## betas:    1.2570  -0.2300   0.1466  -0.5153   0.6748   0.8139   1.1443   0.6074   1.8422   0.8010  -(
##
## sigma: 0.188261
## lambda (gene 1): 0.768435
## epsilon (gene 1): 0.0960181
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.5
## ---------------------------------------------------------
## Iteration 7000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.462
## delta (gene 1): 14.8469
## s (cell 1): 1.14531
## nu (cell 1): 1.12393
## theta (batch 1): 0.0223525
## betas:    1.4021  -0.1528   0.4413  -0.6393   0.6980   1.0375   0.9097   0.7382   1.3380   0.8713  -(
##
## sigma: 0.202528
## lambda (gene 1): 1.56495
## epsilon (gene 1): -0.118775
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 7040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.306
## delta (gene 1): 14.9361
## s (cell 1): 1.16637
## nu (cell 1): 1.16969
## theta (batch 1): 0.0309965
## betas:    1.2440  -0.1210  -0.2225  -0.1552   0.6390   1.2301   0.7729   0.8287   1.4661   0.5888  -(
##
## sigma: 0.187056
## lambda (gene 1): 0.527608
## epsilon (gene 1): -0.106644
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 7080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 336.02
## delta (gene 1): 13.6544
## s (cell 1): 1.04297
## nu (cell 1): 1.02123
## theta (batch 1): 0.0231766
## betas:    1.2463  -0.1770  -0.3368   0.5897   0.3549   1.0851   0.7628   1.1106   1.3100   0.9070  -(
```

```
##
## sigma: 0.177221
## lambda (gene 1): 1.98705
## epsilon (gene 1): -0.097027
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 7120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.567
## delta (gene 1): 17.7532
## s (cell 1): 1.00203
## nu (cell 1): 1.0468
## theta (batch 1): 0.019962
## betas:    1.4390  -0.1990  -0.5423   0.1257   0.1119   0.8948   1.0881   0.5646   1.6568   0.8049  -(
##
## sigma: 0.185693
## lambda (gene 1): 1.13354
## epsilon (gene 1): 0.019241
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 7160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 284.865
## delta (gene 1): 15.7543
## s (cell 1): 1.20385
## nu (cell 1): 1.17167
## theta (batch 1): 0.00831145
## betas:    1.0245  -0.0451  -0.0769   0.4523   0.1521   1.1299   1.4765   0.2960   1.6456   0.5425  -
##
## sigma: 0.179451
## lambda (gene 1): 0.166526
## epsilon (gene 1): -0.251742
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 7200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 324.52
## delta (gene 1): 10.8408
## s (cell 1): 0.980949
## nu (cell 1): 1.04268
## theta (batch 1): 0.0062629
## betas:    0.9705  -0.1396   0.0074  -0.1388   0.5216   0.8996   1.1713   0.9215   1.4636   0.8564  -(
##
## sigma: 0.192099
## lambda (gene 1): 1.05162
## epsilon (gene 1): -0.530909
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 7240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 249.962
## delta (gene 1): 15.9318
## s (cell 1): 1.192
## nu (cell 1): 1.13528
## theta (batch 1): 0.00280008
## betas:    1.7547  -0.3226  -0.6017  -0.3941   0.2084   0.8418   0.6882   1.1234   1.3002   0.9822  -(
##
## sigma: 0.185998
## lambda (gene 1): 0.869168
## epsilon (gene 1): -0.123987
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 7280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.753
## delta (gene 1): 17.289
## s (cell 1): 1.03612
## nu (cell 1): 1.09822
## theta (batch 1): 0.00130861
## betas:    1.2571  -0.1957  -0.5104  -0.4331   1.0482   0.7172   1.0677   1.0618   1.1783   1.1068  -(
##
## sigma: 0.177952
## lambda (gene 1): 1.07009
## epsilon (gene 1): 0.122899
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
```

```
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 7320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 111.85
## delta (gene 1): 21.7684
## s (cell 1): 0.94588
## nu (cell 1): 1.02572
## theta (batch 1): 0.00197866
## betas:    1.0356  -0.1633   0.5346  -0.4366   0.1338   1.3039   1.1200   0.7855   1.5833   0.9124  -0
##
## sigma: 0.179826
## lambda (gene 1): 0.750667
## epsilon (gene 1): -0.0367575
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 7360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.655
## delta (gene 1): 16.1721
## s (cell 1): 0.974938
## nu (cell 1): 1.15716
## theta (batch 1): 0.0126816
## betas:    1.3360  -0.0939   0.0327  -0.1155   0.5843   0.9675   0.9160   0.9053   0.9630   1.1127  -0
##
## sigma: 0.195165
## lambda (gene 1): 1.2154
## epsilon (gene 1): -0.128137
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 7400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.724
## delta (gene 1): 13.6312
## s (cell 1): 0.973566
## nu (cell 1): 1.08207
## theta (batch 1): 0.0110551
## betas:    1.3589  -0.1461   0.8478   0.1524   0.1493   1.2464   0.9349   0.8178   1.2412   0.8129  -0
##
## sigma: 0.203977
```

```
## lambda (gene 1): 0.78286
## epsilon (gene 1): 0.325232
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 7440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.348
## delta (gene 1): 13.6258
## s (cell 1): 1.20262
## nu (cell 1): 1.12059
## theta (batch 1): 0.010848
## betas:    1.3194  -0.2034   0.3084  -0.3197   0.4965   0.9226   1.1741   0.7756   1.4475   0.8042  -
##
## sigma: 0.186384
## lambda (gene 1): 0.801093
## epsilon (gene 1): 0.335214
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 7480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 341.358
## delta (gene 1): 18.2231
## s (cell 1): 1.05241
## nu (cell 1): 1.10122
## theta (batch 1): 0.00764077
## betas:    1.2609  -0.1762   0.1596   0.0003   0.6346   0.9984   1.0656   0.9544   1.1211   1.2448  -
##
## sigma: 0.174956
## lambda (gene 1): 1.16787
## epsilon (gene 1): 0.0394229
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 7520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.917
## delta (gene 1): 16.2375
```

```
## s (cell 1): 1.05965
## nu (cell 1): 1.06103
## theta (batch 1): 0.0075344
## betas:    0.9687  -0.1559  -0.5295   0.4465   0.4810   1.2784   1.0521   1.0376   1.2460   1.2202  -
##
## sigma: 0.178584
## lambda (gene 1): 1.42433
## epsilon (gene 1): 0.0649742
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 7560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.714
## delta (gene 1): 18.993
## s (cell 1): 0.920232
## nu (cell 1): 1.02994
## theta (batch 1): 0.00466087
## betas:    1.5427  -0.1011   0.1890  -0.0223   0.4782   0.9372   0.8725   0.8801   0.8841   0.8251  -
##
## sigma: 0.190018
## lambda (gene 1): 0.651545
## epsilon (gene 1): 0.131512
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 7600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.745
## delta (gene 1): 13.165
## s (cell 1): 1.08453
## nu (cell 1): 1.12298
## theta (batch 1): 0.0026544
## betas:    0.9310  -0.1784   0.0423   0.4577   0.8716   0.5970   1.3983   1.0070   1.3038   1.2115  -
##
## sigma: 0.197619
## lambda (gene 1): 0.874609
## epsilon (gene 1): -0.125684
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
```

```
## -------------------------------------------------------
## Iteration 7640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.903
## delta (gene 1): 13.0419
## s (cell 1): 1.0005
## nu (cell 1): 1.13261
## theta (batch 1): 0.00371943
## betas:    1.9562  -0.2897   0.1650  -0.3731   0.1270   0.5578   1.1212   0.4550   1.8095   0.1762   (
##
## sigma: 0.180446
## lambda (gene 1): 1.43753
## epsilon (gene 1): -0.11127
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 7680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.506
## delta (gene 1): 14.7471
## s (cell 1): 1.02283
## nu (cell 1): 1.06092
## theta (batch 1): 0.00188697
## betas:    0.9129  -0.1670  -0.1066   0.7930   0.0847   1.1934   1.1368   0.8753   1.5956   1.0415   -(
##
## sigma: 0.180135
## lambda (gene 1): 0.456938
## epsilon (gene 1): 0.319972
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 7720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 281.312
## delta (gene 1): 17.6667
## s (cell 1): 1.10662
## nu (cell 1): 1.04923
## theta (batch 1): 0.00150331
## betas:    1.3664  -0.2769   0.3880   0.2159   0.2196   1.1844   0.8509   1.0487   1.4475   1.0980   -(
##
## sigma: 0.184924
## lambda (gene 1): 0.633904
## epsilon (gene 1): 0.550333
```

```
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 7760 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.32
## delta (gene 1): 16.9116
## s (cell 1): 0.916597
## nu (cell 1): 1.01418
## theta (batch 1): 0.016071
## betas:    2.0693  -0.1522  -0.6074   0.6318   0.4402   0.5607   0.7432   0.6341   0.9977   0.5763  -(
##
## sigma: 0.187257
## lambda (gene 1): 1.63405
## epsilon (gene 1): -0.0202945
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 7800 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 290.121
## delta (gene 1): 15.9252
## s (cell 1): 1.03709
## nu (cell 1): 1.05463
## theta (batch 1): 0.0074385
## betas:    1.2393  -0.1347   0.5978   0.1775   0.0135   1.2491   1.0050   0.7508   1.4292   0.6645  -(
##
## sigma: 0.194728
## lambda (gene 1): 2.09906
## epsilon (gene 1): -0.0813996
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 7840 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 124.256
## delta (gene 1): 14.0857
## s (cell 1): 1.14867
## nu (cell 1): 1.13247
```

```
## theta (batch 1): 0.00837767
## betas:     1.2276  -0.1836   0.1724   0.6185  -0.2093   1.1678   0.9495   1.1375   1.1019   1.0461  -(
##
## sigma: 0.177646
## lambda (gene 1): 0.374223
## epsilon (gene 1): -0.201412
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 7880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.141
## delta (gene 1): 13.5385
## s (cell 1): 1.06488
## nu (cell 1): 1.06174
## theta (batch 1): 0.00461701
## betas:     1.7686  -0.1608  -0.4390   0.8141  -0.0911   0.6979   0.7667   0.8793   1.2245   0.3204  -(
##
## sigma: 0.186636
## lambda (gene 1): 0.456244
## epsilon (gene 1): -0.205655
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 7920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.016
## delta (gene 1): 18.0117
## s (cell 1): 1.25344
## nu (cell 1): 1.07977
## theta (batch 1): 0.0111691
## betas:     1.3919  -0.1847  -0.3005  -0.2708   0.3762   0.6195   1.1796   0.6839   1.3754   1.1484  -(
##
## sigma: 0.180056
## lambda (gene 1): 0.752459
## epsilon (gene 1): -0.129726
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 7960 out of 40000 has been completed.
```

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## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 325.911
## delta (gene 1): 14.75
## s (cell 1): 0.928109
## nu (cell 1): 1.06462
## theta (batch 1): 0.0103949
## betas:    1.6765  -0.1928   0.1069  -0.2923   0.2777   0.9188   0.7244   0.9833   1.0402   0.9827  -(
##
## sigma: 0.185794
## lambda (gene 1): 1.09783
## epsilon (gene 1): -0.116426
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 8000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 390.818
## delta (gene 1): 12.8067
## s (cell 1): 1.06405
## nu (cell 1): 1.0905
## theta (batch 1): 0.0389908
## betas:    1.4075  -0.2184  -0.0872  -0.0335   0.1066   0.9749   1.3254   0.4521   1.7380   0.6491  -(
##
## sigma: 0.192652
## lambda (gene 1): 2.15769
## epsilon (gene 1): 0.164437
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 8040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.815
## delta (gene 1): 10.5437
## s (cell 1): 0.957714
## nu (cell 1): 1.03799
## theta (batch 1): 0.0793901
## betas:    1.1957  -0.1527   0.2640   0.1269   0.5358   1.0614   1.2482   0.6344   1.5854   0.5571  -(
##
## sigma: 0.18363
## lambda (gene 1): 0.954674
## epsilon (gene 1): 0.0164157
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 8080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.699
## delta (gene 1): 14.0653
## s (cell 1): 1.09628
## nu (cell 1): 1.1101
## theta (batch 1): 0.0222683
## betas:    1.2480  -0.0400   0.4406   0.0601   0.1281   1.4513   0.7126   0.9052   1.2054   0.4147  -(
##
## sigma: 0.181525
## lambda (gene 1): 0.326265
## epsilon (gene 1): -0.0693369
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 8120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.687
## delta (gene 1): 17.7667
## s (cell 1): 1.19962
## nu (cell 1): 1.09143
## theta (batch 1): 0.0198692
## betas:    1.1051  -0.1792   0.1324   0.3838   0.4056   1.1207   0.9060   1.1040   1.2764   1.0878  -(
##
## sigma: 0.185186
## lambda (gene 1): 1.22407
## epsilon (gene 1): 0.235322
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 8160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 278.182
## delta (gene 1): 15.1335
## s (cell 1): 0.684058
## nu (cell 1): 1.05613
## theta (batch 1): 0.0513752
## betas:    1.8859  -0.1828  -0.1736   0.3631   0.1884   0.4084   1.1034   0.6096   1.2153   0.6018  -(
```

```
## 
## sigma: 0.175379
## lambda (gene 1): 1.84753
## epsilon (gene 1): -0.00528366
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 8200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 314.75
## delta (gene 1): 14.0605
## s (cell 1): 1.24426
## nu (cell 1): 1.10978
## theta (batch 1): 0.0288052
## betas:     1.2596   -0.1353    0.6446    0.5319   -0.3292    1.2022    1.2190    0.5469    1.5516    0.5454   -(
## 
## sigma: 0.19739
## lambda (gene 1): 0.538692
## epsilon (gene 1): 0.0489599
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 8240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 361.85
## delta (gene 1): 12.9574
## s (cell 1): 0.990565
## nu (cell 1): 1.01895
## theta (batch 1): 0.0623382
## betas:     1.7439   -0.2149   -0.1610   -0.1820    0.5980    0.2859    1.4385    0.3055    1.4758    0.8563   -(
## 
## sigma: 0.19238
## lambda (gene 1): 0.295684
## epsilon (gene 1): -0.0310023
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 8280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 281.085
## delta (gene 1): 19.0178
## s (cell 1): 0.933393
## nu (cell 1): 1.15178
## theta (batch 1): 0.0188562
## betas:    1.8225  -0.1482  -0.6520   0.3847   0.2735   0.8924   0.6413   0.8816   0.9648   0.7317  -(
##
## sigma: 0.201315
## lambda (gene 1): 1.23686
## epsilon (gene 1): 0.531566
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.7
## ------------------------------------------------------------
## Iteration 8320 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 280.017
## delta (gene 1): 18.0158
## s (cell 1): 1.28089
## nu (cell 1): 1.07978
## theta (batch 1): 0.0118639
## betas:    0.8008  -0.0713  -0.1171   0.1980   1.2391   0.8640   1.1286   0.9635   1.5192   0.4502  -(
##
## sigma: 0.177809
## lambda (gene 1): 1.42453
## epsilon (gene 1): 0.148268
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -1.8
## ------------------------------------------------------------
## Iteration 8360 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 298.509
## delta (gene 1): 13.4947
## s (cell 1): 1.09693
## nu (cell 1): 1.13518
## theta (batch 1): 0.0179633
## betas:    1.3260  -0.0593   0.0282   0.0866   0.5486   0.9091   1.0001   0.7705   1.0488   0.8449  -1
##
## sigma: 0.174796
## lambda (gene 1): 1.59156
## epsilon (gene 1): -0.407769
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
```

```
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 8400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.263
## delta (gene 1): 15.2816
## s (cell 1): 1.01545
## nu (cell 1): 1.05167
## theta (batch 1): 0.00971197
## betas:    1.6055  -0.0503   0.1242   0.1690   0.0220   1.6352   0.4443   0.6815   1.1944   0.3267  -(
##
## sigma: 0.199099
## lambda (gene 1): 1.02339
## epsilon (gene 1): -0.103271
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 8440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.805
## delta (gene 1): 13.8236
## s (cell 1): 1.03907
## nu (cell 1): 1.06652
## theta (batch 1): 0.0117852
## betas:    1.0396  -0.0615  -0.6359   0.3640   0.8341   0.9251   1.0013   0.9760   1.2215   0.5224  -(
##
## sigma: 0.180274
## lambda (gene 1): 0.990899
## epsilon (gene 1): -0.173422
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 8480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.915
## delta (gene 1): 15.7612
## s (cell 1): 1.06451
## nu (cell 1): 1.05832
## theta (batch 1): 0.00996296
## betas:    0.9789  -0.0385   0.3075  -0.0590   1.2720   0.5266   1.2765   0.8594   1.1543   0.9071  -(
##
## sigma: 0.179084
```

```
## lambda (gene 1): 0.340091
## epsilon (gene 1): -0.159692
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 8520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.195
## delta (gene 1): 15.699
## s (cell 1): 1.37726
## nu (cell 1): 1.03998
## theta (batch 1): 0.0205895
## betas:    1.9548  -0.2196  -0.4328  -0.4572   0.0076   0.9884   0.4606   0.7826   1.3560   0.6002  -(
##
## sigma: 0.188356
## lambda (gene 1): 1.72691
## epsilon (gene 1): -0.0192085
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 8560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.809
## delta (gene 1): 17.0799
## s (cell 1): 1.12613
## nu (cell 1): 1.03447
## theta (batch 1): 0.0328475
## betas:    1.0519  -0.1620  -0.1173   0.0990   0.3125   1.3485   0.8372   1.0961   1.4186   0.7885  -(
##
## sigma: 0.187548
## lambda (gene 1): 1.23647
## epsilon (gene 1): 0.0627155
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.3
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 8600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.635
## delta (gene 1): 11.5533
```

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## s (cell 1): 1.23281
## nu (cell 1): 1.0296
## theta (batch 1): 0.0293912
## betas:    1.6891  -0.0869  -0.4716  -0.0519   0.5832   0.9639   0.7660   0.4827   1.4343   0.2303  -(
##
## sigma: 0.193517
## lambda (gene 1): 0.175764
## epsilon (gene 1): -0.535191
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.2
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 8640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 155.385
## delta (gene 1): 11.244
## s (cell 1): 1.59189
## nu (cell 1): 1.02542
## theta (batch 1): 0.0384265
## betas:    1.4116  -0.2087  -0.2063  -0.0341   1.0263   0.2727   1.2821   0.6958   1.7128   0.4247  -(
##
## sigma: 0.176471
## lambda (gene 1): 0.174885
## epsilon (gene 1): -0.538875
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.2
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 8680 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.391
## delta (gene 1): 14.8171
## s (cell 1): 1.40086
## nu (cell 1): 1.10973
## theta (batch 1): 0.0131729
## betas:    2.1171  -0.0981  -0.1468  -0.4209   0.7824   0.3220   0.8732   0.4048   1.0783   0.4822  -1
##
## sigma: 0.181264
## lambda (gene 1): 0.877726
## epsilon (gene 1): -0.0324594
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.3
## LStheta (batch 1): -1.9
```

```
## ---------------------------------------------------------
## Iteration 8720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 188.362
## delta (gene 1): 11.5655
## s (cell 1): 1.17706
## nu (cell 1): 1.04777
## theta (batch 1): 0.00532232
## betas:    0.8646  -0.0981   0.5916   0.1491   0.9263   1.0117   1.3351   0.7655   1.3934   0.9042  -(
##
## sigma: 0.184601
## lambda (gene 1): 5.75438
## epsilon (gene 1): -0.0375678
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 8760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.98
## delta (gene 1): 19.0372
## s (cell 1): 1.18022
## nu (cell 1): 1.13287
## theta (batch 1): 0.00222848
## betas:    0.7496  -0.0933  -0.6566   0.2458   0.3764   1.3782   0.9197   1.0977   1.3720   1.0696  -(
##
## sigma: 0.182612
## lambda (gene 1): 1.23508
## epsilon (gene 1): -0.296994
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 8800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 370.884
## delta (gene 1): 18.1837
## s (cell 1): 1.05135
## nu (cell 1): 0.993689
## theta (batch 1): 0.00224633
## betas:    1.0914  -0.1419   0.2329  -0.0042   0.0694   1.2169   1.3539   0.4562   1.8066   0.4743  -(
##
## sigma: 0.193232
## lambda (gene 1): 1.45247
## epsilon (gene 1): 0.471362
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 8840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.954
## delta (gene 1): 12.4312
## s (cell 1): 1.03503
## nu (cell 1): 1.04576
## theta (batch 1): 0.000874953
## betas:    1.2660  -0.0830  -0.3360  -0.2364   0.7261   0.7977   1.3060   0.5623   1.2451   0.7549  -(
##
## sigma: 0.184859
## lambda (gene 1): 0.858888
## epsilon (gene 1): 0.108286
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 8880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.412
## delta (gene 1): 12.1666
## s (cell 1): 1.07004
## nu (cell 1): 1.09273
## theta (batch 1): 0.000875216
## betas:    1.4098  -0.2289   0.2769  -0.4610   0.5125   0.9692   0.9552   0.8101   1.6835   0.4832  -(
##
## sigma: 0.183891
## lambda (gene 1): 0.411472
## epsilon (gene 1): -0.129821
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 8920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.964
## delta (gene 1): 14.971
## s (cell 1): 1.18039
## nu (cell 1): 1.11571
```

```
## theta (batch 1): 0.00147528
## betas:    1.6603  -0.2671  -0.3307  -0.4095   0.2965   0.9017   0.8350   1.0131   1.3028   0.8425  -
##
## sigma: 0.181239
## lambda (gene 1): 1.69184
## epsilon (gene 1): -0.271709
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 8960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 188.405
## delta (gene 1): 18.3607
## s (cell 1): 1.03098
## nu (cell 1): 1.04858
## theta (batch 1): 0.00142346
## betas:    1.4899  -0.1344  -0.3157   0.1533   0.2491   1.2506   0.7787   0.6445   1.5350   0.4573  -
##
## sigma: 0.186509
## lambda (gene 1): 1.33471
## epsilon (gene 1): -0.076283
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 9000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.781
## delta (gene 1): 22.6533
## s (cell 1): 1.08297
## nu (cell 1): 1.04026
## theta (batch 1): 0.00363086
## betas:    1.5136  -0.2534   0.2033   0.2149  -0.1100   1.0051   0.8363   0.8816   1.4496   0.9840  -
##
## sigma: 0.203323
## lambda (gene 1): 0.901769
## epsilon (gene 1): 0.785466
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 9040 out of 40000 has been completed.
```

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## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.688
## delta (gene 1): 12.2599
## s (cell 1): 1.16525
## nu (cell 1): 1.06915
## theta (batch 1): 0.00264136
## betas:    1.9849  -0.2595  -0.0259  -0.3990   0.0369   0.4798   0.8637   0.6019   1.3720   0.8975  -(
##
## sigma: 0.188649
## lambda (gene 1): 1.05577
## epsilon (gene 1): 0.207706
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 9080 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.974
## delta (gene 1): 15.0016
## s (cell 1): 1.10576
## nu (cell 1): 1.08138
## theta (batch 1): 0.00793398
## betas:    1.2762  -0.3952  -0.1911  -0.3408   0.3986   0.6483   1.2084   0.8983   1.8888   1.2977   (
##
## sigma: 0.177419
## lambda (gene 1): 0.579124
## epsilon (gene 1): -0.267736
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 9120 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 363.963
## delta (gene 1): 16.1543
## s (cell 1): 1.05568
## nu (cell 1): 1.07806
## theta (batch 1): 0.00778107
## betas:    1.2875  -0.2918  -0.4901   0.2919   0.3087   0.8181   1.3739   0.7151   1.6793   1.0698  -(
##
## sigma: 0.182924
## lambda (gene 1): 0.0897844
## epsilon (gene 1): -0.0376133
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 9160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.301
## delta (gene 1): 14.0863
## s (cell 1): 1.0988
## nu (cell 1): 1.15589
## theta (batch 1): 0.00592675
## betas:    1.2166  -0.2786   0.1620  -0.2707   0.3090   1.1978   0.9852   0.9099   1.7340   0.9395  -(
##
## sigma: 0.180395
## lambda (gene 1): 0.675953
## epsilon (gene 1): -0.24973
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 9200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.036
## delta (gene 1): 17.4079
## s (cell 1): 1.19857
## nu (cell 1): 1.19528
## theta (batch 1): 0.00207392
## betas:    1.8572  -0.1485   0.5334  -0.5411   0.4544   0.6539   1.1148   0.3764   1.2972   0.4851  -(
##
## sigma: 0.209168
## lambda (gene 1): 1.04103
## epsilon (gene 1): -0.070311
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 9240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.736
## delta (gene 1): 15.8692
## s (cell 1): 1.01062
## nu (cell 1): 1.00005
## theta (batch 1): 0.00138956
## betas:    1.0598  -0.0660   1.1688   0.2388   0.5147   1.5169   0.6711   1.0337   1.2136   0.6727  -
```

```
## 
## sigma: 0.185556
## lambda (gene 1): 0.992257
## epsilon (gene 1): -0.167661
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 9280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 358.516
## delta (gene 1): 16.8912
## s (cell 1): 1.05936
## nu (cell 1): 1.0891
## theta (batch 1): 0.00117297
## betas:    1.9277  -0.1661  -0.2991  -0.4234   0.6968   0.5259   1.0507   0.3194   1.5212   0.3979  -(
## 
## sigma: 0.17706
## lambda (gene 1): 1.62738
## epsilon (gene 1): -0.086279
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 9320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.241
## delta (gene 1): 15.1871
## s (cell 1): 1.13212
## nu (cell 1): 1.14792
## theta (batch 1): 0.000136259
## betas:    1.4040  -0.0741   0.1351   0.5252   0.8051   0.6638   1.0650   0.7895   1.2570   0.1121  -(
## 
## sigma: 0.173418
## lambda (gene 1): 1.35877
## epsilon (gene 1): -0.156047
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 9360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 242.593
## delta (gene 1): 14.3484
## s (cell 1): 1.00208
## nu (cell 1): 1.01263
## theta (batch 1): 0.000353788
## betas:    2.0024  -0.1826   0.0579  -0.1478   0.2808   0.7325   0.8301   0.4711   1.3941   0.4464  -(
##
## sigma: 0.195404
## lambda (gene 1): 0.79426
## epsilon (gene 1): -0.265973
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 9400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.446
## delta (gene 1): 13.2657
## s (cell 1): 1.13775
## nu (cell 1): 1.11233
## theta (batch 1): 0.00155199
## betas:    1.6930  -0.2725   0.3271  -0.3202   0.4967   0.6053   0.9791   0.7675   1.4741   0.9651  -(
##
## sigma: 0.203335
## lambda (gene 1): 1.06498
## epsilon (gene 1): 0.256081
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 9440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.059
## delta (gene 1): 17.3897
## s (cell 1): 1.2116
## nu (cell 1): 1.22871
## theta (batch 1): 0.00142715
## betas:    1.2895  -0.1793  -0.1673  -0.0037   0.8616   0.5192   1.1481   0.9860   1.2693   0.8088  -(
##
## sigma: 0.187841
## lambda (gene 1): 0.4253
## epsilon (gene 1): 0.566422
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
```

```
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 9480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 145.786
## delta (gene 1): 13.6941
## s (cell 1): 1.06833
## nu (cell 1): 1.03615
## theta (batch 1): 0.00265836
## betas:    0.7307  -0.0770  -0.3659   0.1804   0.9006   1.1971   1.1894   0.8389   1.5727   0.7233  -0
##
## sigma: 0.187577
## lambda (gene 1): 1.8607
## epsilon (gene 1): 0.0708142
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.5
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 9520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.216
## delta (gene 1): 12.0826
## s (cell 1): 0.974368
## nu (cell 1): 1.0438
## theta (batch 1): 0.00321663
## betas:    1.3709  -0.1806   0.3381  -0.2791   0.2890   0.9524   1.0700   0.5451   1.7815   0.6640  -0
##
## sigma: 0.180314
## lambda (gene 1): 2.92695
## epsilon (gene 1): -0.168699
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 9560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 352.74
## delta (gene 1): 11.871
## s (cell 1): 1.0437
## nu (cell 1): 1.04335
## theta (batch 1): 0.0021061
## betas:    1.0632  -0.1379  -0.2297  -0.6335   0.5296   1.4453   0.9303   0.7785   1.6698   0.7173  -0
##
## sigma: 0.179573
```

```
## lambda (gene 1): 0.519342
## epsilon (gene 1): -0.492839
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 9600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.967
## delta (gene 1): 15.5812
## s (cell 1): 1.21484
## nu (cell 1): 1.12582
## theta (batch 1): 0.0036537
## betas:    0.9595  -0.1862  -0.9585  -0.1088   0.4396   1.1404   1.4399   0.5533   1.8325   0.8059  -(
##
## sigma: 0.192249
## lambda (gene 1): 0.898709
## epsilon (gene 1): 0.31652
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 9640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.51
## delta (gene 1): 14.0472
## s (cell 1): 1.03363
## nu (cell 1): 1.13247
## theta (batch 1): 0.00517899
## betas:    0.9642  -0.0848   0.1721  -0.0014   0.3238   1.3665   0.8772   0.9647   1.3526   0.8049  -(
##
## sigma: 0.178
## lambda (gene 1): 1.51187
## epsilon (gene 1): 0.268545
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 9680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.222
## delta (gene 1): 13.6453
```

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## s (cell 1): 1.18756
## nu (cell 1): 1.11484
## theta (batch 1): 0.00309859
## betas:    0.8153  -0.1666  -0.5067  -0.5337   0.9012   0.9709   1.0814   1.2312   1.3886   0.9929  -(
##
## sigma: 0.173768
## lambda (gene 1): 0.414395
## epsilon (gene 1): 0.0330287
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ----------------------------------------------------------
## Iteration 9720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.621
## delta (gene 1): 13.3952
## s (cell 1): 1.04867
## nu (cell 1): 1.11353
## theta (batch 1): 0.00506082
## betas:    0.8397  -0.0364  -0.2296   0.1011   0.8680   1.2887   0.7344   1.1402   1.2875   0.4901  -(
##
## sigma: 0.180535
## lambda (gene 1): 2.28828
## epsilon (gene 1): 0.0512704
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 9760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 120.651
## delta (gene 1): 16.1064
## s (cell 1): 1.14593
## nu (cell 1): 1.12779
## theta (batch 1): 0.00410884
## betas:    0.9768  -0.1109  -0.1412  -0.0829   0.6215   1.2236   0.8406   1.1589   1.2403   0.7623  -(
##
## sigma: 0.17829
## lambda (gene 1): 1.01449
## epsilon (gene 1): -0.127616
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
```

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## ------------------------------------------------------
## Iteration 9800 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.75
## delta (gene 1): 20.6388
## s (cell 1): 1.0953
## nu (cell 1): 1.04723
## theta (batch 1): 0.00334971
## betas:    1.1816  -0.1618  -0.3802   0.4485   0.1917   1.1946   0.7769   0.9957   1.4491   0.7415  -(
##
## sigma: 0.199492
## lambda (gene 1): 0.798448
## epsilon (gene 1): 0.10469
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 9840 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.234
## delta (gene 1): 14.8531
## s (cell 1): 1.0612
## nu (cell 1): 1.03717
## theta (batch 1): 0.0229116
## betas:    1.1472  -0.1665   0.6804  -0.5538   0.9755   0.7553   0.8709   1.0915   1.2785   1.1528  -(
##
## sigma: 0.18658
## lambda (gene 1): 0.224368
## epsilon (gene 1): -0.212356
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 9880 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.092
## delta (gene 1): 25.2688
## s (cell 1): 1.23762
## nu (cell 1): 0.979852
## theta (batch 1): 0.0358955
## betas:    1.4310  -0.2071   0.1522   0.1075   0.5674   0.6188   1.0781   0.9541   1.2019   1.0733  -(
##
## sigma: 0.182126
## lambda (gene 1): 0.221088
## epsilon (gene 1): 0.153253
```

```
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ------------------------------------------------------
## Iteration 9920 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.436
## delta (gene 1): 13.7142
## s (cell 1): 0.82502
## nu (cell 1): 1.0606
## theta (batch 1): 0.0780394
## betas:    1.4616  -0.0647   0.4211   0.6411   0.3957   1.0436   0.6390   1.0163   0.9773   0.3941  -(
##
## sigma: 0.181996
## lambda (gene 1): 0.938656
## epsilon (gene 1): -0.779367
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 9960 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 322.326
## delta (gene 1): 10.6929
## s (cell 1): 0.830459
## nu (cell 1): 1.15146
## theta (batch 1): 0.0561197
## betas:    1.5447  -0.2913   0.4537  -0.3991   0.4196   1.1664   0.5892   1.2278   1.3445   0.9080  -(
##
## sigma: 0.187809
## lambda (gene 1): 0.688623
## epsilon (gene 1): -0.86889
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## ------------------------------------------------------
## Iteration 10000 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.281
## delta (gene 1): 17.9316
## s (cell 1): 1.02756
## nu (cell 1): 1.03493
```

```
## theta (batch 1): 0.0649622
## betas:    1.4945  -0.1704  -0.1532   0.1812   0.6673   0.6757   1.0141   0.7718   1.2464   0.9782  -(
##
## sigma: 0.195055
## lambda (gene 1): 0.85189
## epsilon (gene 1): -0.173769
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 10040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.985
## delta (gene 1): 14.677
## s (cell 1): 0.972517
## nu (cell 1): 1.05719
## theta (batch 1): 0.0295418
## betas:    1.5992  -0.1789  -0.2262   0.1528   0.1181   0.9994   0.8927   0.7114   1.2802   1.0020  -(
##
## sigma: 0.1788
## lambda (gene 1): 0.739162
## epsilon (gene 1): -0.373173
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 10080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.415
## delta (gene 1): 12.6222
## s (cell 1): 1.1047
## nu (cell 1): 1.15545
## theta (batch 1): 0.0401652
## betas:    1.7012  -0.2040   0.1146   0.4990  -0.1211   0.3769   1.2506   0.5247   1.4997   0.5700  -(
##
## sigma: 0.173711
## lambda (gene 1): 1.03653
## epsilon (gene 1): -0.574855
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 10120 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 293.646
## delta (gene 1): 14.6386
## s (cell 1): 1.18751
## nu (cell 1): 0.968588
## theta (batch 1): 0.0311153
## betas:    1.3609  -0.1406   0.8107   0.0965   0.1115   1.3610   0.8776   0.6514   1.6401   0.3016  -(
##
## sigma: 0.186037
## lambda (gene 1): 2.46604
## epsilon (gene 1): 0.254792
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 10160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.355
## delta (gene 1): 14.8224
## s (cell 1): 1.08588
## nu (cell 1): 1.07755
## theta (batch 1): 0.0245835
## betas:    1.0715  -0.2161   0.2972   0.3007  -0.1879   1.0875   1.2264   0.7813   1.7216   0.8436  -(
##
## sigma: 0.176925
## lambda (gene 1): 1.71532
## epsilon (gene 1): -0.0213156
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 10200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.702
## delta (gene 1): 18.2357
## s (cell 1): 1.26096
## nu (cell 1): 1.02206
## theta (batch 1): 0.0483552
## betas:    1.5838  -0.2180   0.3516  -0.5173   0.3720   1.1363   0.5885   1.1357   1.1449   0.8277  -(
##
## sigma: 0.201765
## lambda (gene 1): 1.30805
## epsilon (gene 1): 0.054325
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 10240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 268.128
## delta (gene 1): 15.4018
## s (cell 1): 1.13901
## nu (cell 1): 1.13419
## theta (batch 1): 0.0121664
## betas:    1.6972  -0.2006  -0.1750  -0.0801   0.6044   0.7922   0.9561   0.6052   1.6468   0.1120  -(
##
## sigma: 0.174261
## lambda (gene 1): 1.31816
## epsilon (gene 1): -0.102223
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 10280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 119.026
## delta (gene 1): 12.7956
## s (cell 1): 1.07508
## nu (cell 1): 1.08256
## theta (batch 1): 0.0336704
## betas:    1.6712  -0.1942  -0.5598   0.2944   0.1233   0.8678   0.9719   0.6626   1.3196   0.8274  -(
##
## sigma: 0.186214
## lambda (gene 1): 1.78964
## epsilon (gene 1): -0.598195
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 10320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.666
## delta (gene 1): 16.2582
## s (cell 1): 1.0199
## nu (cell 1): 1.06597
## theta (batch 1): 0.02079
## betas:    1.1732  -0.2088   0.1456  -0.4176   0.9681   0.4313   1.1762   1.0705   1.3202   1.1191  -(
```

```
##
## sigma: 0.180401
## lambda (gene 1): 0.592708
## epsilon (gene 1): 0.0453951
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 10360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.661
## delta (gene 1): 10.8365
## s (cell 1): 0.82877
## nu (cell 1): 0.979342
## theta (batch 1): 0.0109924
## betas:    1.5818  -0.2723   0.2215  -0.4747  -0.0209   1.2345   0.8009   0.8407   1.6951   0.5090  (
##
## sigma: 0.190567
## lambda (gene 1): 0.278372
## epsilon (gene 1): -0.891602
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 10400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.03
## delta (gene 1): 17.3522
## s (cell 1): 1.39892
## nu (cell 1): 1.13782
## theta (batch 1): 0.0103171
## betas:    1.1594  -0.1610   0.0125  -0.0802   0.3498   1.2165   0.8668   0.7285   1.8433   0.3464  (
##
## sigma: 0.192596
## lambda (gene 1): 0.732939
## epsilon (gene 1): 0.132766
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 10440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 114.778
## delta (gene 1): 15.0294
## s (cell 1): 1.05001
## nu (cell 1): 1.04394
## theta (batch 1): 0.0122783
## betas:    1.2983  -0.2674  -0.0085  -0.1462   0.5303   0.8067   0.9724   0.8594   1.7378   0.9984  -(
##
## sigma: 0.178463
## lambda (gene 1): 1.28502
## epsilon (gene 1): -0.0134122
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 10480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.06
## delta (gene 1): 15.7058
## s (cell 1): 1.29128
## nu (cell 1): 1.08831
## theta (batch 1): 0.0283951
## betas:    1.5439  -0.1497  -0.5341   0.0847   0.2018   1.0239   0.9735   0.7194   1.3141   0.5936  -(
##
## sigma: 0.193259
## lambda (gene 1): 1.15644
## epsilon (gene 1): -0.16621
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 10520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 287.376
## delta (gene 1): 14.7512
## s (cell 1): 1.02652
## nu (cell 1): 1.0647
## theta (batch 1): 0.031659
## betas:    0.9501  -0.1297   0.1114  -0.1617   0.6354   1.2430   0.9838   0.9726   1.4711   0.7274  -(
##
## sigma: 0.180729
## lambda (gene 1): 0.420421
## epsilon (gene 1): 0.0635069
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
```

```
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 10560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.235
## delta (gene 1): 14.4338
## s (cell 1): 0.934952
## nu (cell 1): 1.0227
## theta (batch 1): 0.0136399
## betas:    0.8287  -0.1910   0.0416  -0.0214   1.3374   0.9818   1.0036   1.2353   1.4326   1.1385  -(
##
## sigma: 0.186954
## lambda (gene 1): 0.757773
## epsilon (gene 1): -0.0746296
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 10600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.729
## delta (gene 1): 20.6451
## s (cell 1): 1.15751
## nu (cell 1): 1.0193
## theta (batch 1): 0.0167143
## betas:    0.8823  -0.0680   0.7289  -0.3035   0.9962   0.8449   1.5439   0.4010   1.7412   0.5378  -(
##
## sigma: 0.205692
## lambda (gene 1): 1.18163
## epsilon (gene 1): 0.0717117
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 10640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 249.753
## delta (gene 1): 15.0564
## s (cell 1): 0.959805
## nu (cell 1): 1.1125
## theta (batch 1): 0.0232058
## betas:    1.2659  -0.0761  -0.7208  -0.1873   0.3327   1.5385   0.6196   0.9434   1.1680   0.7031  -(
##
## sigma: 0.180149
```

```
## lambda (gene 1): 1.34909
## epsilon (gene 1): -0.235034
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 10680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 206.06
## delta (gene 1): 14.9277
## s (cell 1): 0.699951
## nu (cell 1): 0.984201
## theta (batch 1): 0.040215
## betas:    1.2209  -0.1690   0.2139  -0.4075  -0.0841   1.4384   0.7695   0.9687   1.4736   0.5991   (
##
## sigma: 0.183834
## lambda (gene 1): 1.09285
## epsilon (gene 1): 0.0296756
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 10720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.722
## delta (gene 1): 15.0149
## s (cell 1): 1.17687
## nu (cell 1): 1.023
## theta (batch 1): 0.0787363
## betas:    0.9238  -0.1030   0.5853  -0.0391   0.9975   0.9099   0.9744   1.2796   0.9713   1.0993   -(
##
## sigma: 0.191378
## lambda (gene 1): 0.741125
## epsilon (gene 1): 0.0209546
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 10760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.169
## delta (gene 1): 14.7994
```

```
## s (cell 1): 0.82596
## nu (cell 1): 1.1379
## theta (batch 1): 0.0690646
## betas:    1.4817  -0.0492   0.4748  -0.0249   0.4154   1.2831   0.4611   1.0427   0.8818   0.6151  -(
##
## sigma: 0.190256
## lambda (gene 1): 2.39896
## epsilon (gene 1): 0.193432
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 10800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.941
## delta (gene 1): 12.5827
## s (cell 1): 1.0653
## nu (cell 1): 1.04758
## theta (batch 1): 0.0250525
## betas:    1.5770  -0.2332   0.4190  -0.4565   0.1864   1.2363   0.7971   0.6067   1.8239   0.4559  -(
##
## sigma: 0.187774
## lambda (gene 1): 1.05313
## epsilon (gene 1): -0.401461
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 10840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.337
## delta (gene 1): 15.3924
## s (cell 1): 1.16415
## nu (cell 1): 1.05964
## theta (batch 1): 0.0296109
## betas:    1.2138  -0.1293  -0.0414   0.5409   0.2644   1.2601   0.7818   0.8811   1.5308   0.4806  -(
##
## sigma: 0.184118
## lambda (gene 1): 0.635817
## epsilon (gene 1): -0.165792
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
```

```
## ---------------------------------------------------------
## Iteration 10880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 399.173
## delta (gene 1): 13.5981
## s (cell 1): 1.11913
## nu (cell 1): 1.1315
## theta (batch 1): 0.0209193
## betas:    1.5041  -0.1899  -0.3424  -0.2338   0.4539   0.9207   0.6627   1.0896   1.2275   0.7532  -(
##
## sigma: 0.18104
## lambda (gene 1): 0.663844
## epsilon (gene 1): -0.346496
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 10920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.459
## delta (gene 1): 15.7484
## s (cell 1): 0.963872
## nu (cell 1): 1.01782
## theta (batch 1): 0.00635555
## betas:    1.1657  -0.2496  -0.2112   0.3134   0.2048   0.9052   1.2696   0.7931   1.7453   0.8479  -(
##
## sigma: 0.177009
## lambda (gene 1): 0.881766
## epsilon (gene 1): -0.10244
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 10960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 329.188
## delta (gene 1): 12.0417
## s (cell 1): 1.09548
## nu (cell 1): 1.0779
## theta (batch 1): 0.00796444
## betas:    1.5803  -0.1796  -0.3083   0.1686  -0.1343   0.8061   0.8463   0.9756   1.0295   1.1620  -
##
## sigma: 0.176273
## lambda (gene 1): 0.715049
## epsilon (gene 1): -0.659354
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 11000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.509
## delta (gene 1): 13.1529
## s (cell 1): 1.16886
## nu (cell 1): 1.0892
## theta (batch 1): 0.0132449
## betas:    1.3057  -0.1417  -0.4746  -0.0005   0.1316   1.2376   0.6238   1.1433   1.0015   1.1605  -(
##
## sigma: 0.194382
## lambda (gene 1): 1.76792
## epsilon (gene 1): -0.123766
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 11040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 273.653
## delta (gene 1): 11.4747
## s (cell 1): 0.898435
## nu (cell 1): 1.10472
## theta (batch 1): 0.0458739
## betas:    1.3387  -0.0351   0.0798   0.0074   0.1076   1.1028   0.9212   0.8180   1.0083   0.8638  -:
##
## sigma: 0.177086
## lambda (gene 1): 1.18513
## epsilon (gene 1): -0.257655
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 11080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.448
## delta (gene 1): 15.1498
## s (cell 1): 0.954853
## nu (cell 1): 1.02884
```

```
## theta (batch 1): 0.0499464
## betas:    1.0496  -0.2342  -0.1044   0.2107   0.2167   0.5163   1.4610   0.8734   1.4748   1.3705  -(
##
## sigma: 0.184772
## lambda (gene 1): 1.07224
## epsilon (gene 1): -0.0667641
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 11120 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.76
## delta (gene 1): 13.8734
## s (cell 1): 1.29032
## nu (cell 1): 1.09034
## theta (batch 1): 0.0757711
## betas:    1.2134  -0.2019  -0.6367  -0.5947   0.8740   1.3229   0.7044   1.1591   1.3884   0.6926   (
##
## sigma: 0.18866
## lambda (gene 1): 0.327746
## epsilon (gene 1): -0.197361
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 11160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.368
## delta (gene 1): 17.0141
## s (cell 1): 1.53889
## nu (cell 1): 0.993731
## theta (batch 1): 0.0464588
## betas:    1.0655  -0.0494   0.2807   0.4054   0.5704   1.0691   1.0274   0.6508   1.6907   0.0395  -(
##
## sigma: 0.190573
## lambda (gene 1): 0.872556
## epsilon (gene 1): -0.097623
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 11200 out of 40000 has been completed.
```

```
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.844
## delta (gene 1): 14.6215
## s (cell 1): 1.19934
## nu (cell 1): 1.09428
## theta (batch 1): 0.00885909
## betas:    1.5912  -0.2055  -0.4444   0.2219   0.1626   0.9892   0.8481   0.9022   1.2903   0.6302  -(
##
## sigma: 0.195634
## lambda (gene 1): 0.469836
## epsilon (gene 1): -0.314653
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 11240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.228
## delta (gene 1): 17.4797
## s (cell 1): 1.31084
## nu (cell 1): 1.12866
## theta (batch 1): 0.0057688
## betas:    1.2010  -0.1087   0.4280   0.4348   0.3866   1.1952   0.7758   1.1526   1.0750   0.7041  -(
##
## sigma: 0.180045
## lambda (gene 1): 0.887227
## epsilon (gene 1): -0.127213
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 11280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 270.805
## delta (gene 1): 10.7062
## s (cell 1): 0.953402
## nu (cell 1): 1.00347
## theta (batch 1): 0.0134771
## betas:    0.9994  -0.2264   0.1768   0.1557   0.1417   1.0859   1.0363   1.1523   1.5585   0.9049  -(
##
## sigma: 0.176198
## lambda (gene 1): 0.0701212
## epsilon (gene 1): -0.530483
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 11320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 133.099
## delta (gene 1): 14.9585
## s (cell 1): 1.61143
## nu (cell 1): 1.02998
## theta (batch 1): 0.0462011
## betas:    1.1501  -0.2656  -0.1562   0.2600   0.1151   1.4129   0.8646   1.3061   1.3355   0.9985  -(
##
## sigma: 0.174919
## lambda (gene 1): 1.31049
## epsilon (gene 1): -0.339771
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 11360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 284.206
## delta (gene 1): 12.659
## s (cell 1): 0.885233
## nu (cell 1): 0.880768
## theta (batch 1): 0.0336537
## betas:    1.4241  -0.1770   0.7124  -0.3437  -0.0535   0.9089   1.2809   0.5465   1.5175   0.8425  -(
##
## sigma: 0.185863
## lambda (gene 1): 2.12615
## epsilon (gene 1): -0.00428886
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 11400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.213
## delta (gene 1): 13.8449
## s (cell 1): 0.956241
## nu (cell 1): 1.07363
## theta (batch 1): 0.0268987
## betas:    1.7529  -0.2829  -0.7883   0.2511  -0.1403   0.5599   1.2361   0.4800   1.6451   0.8130  -(
```

```
## 
## sigma: 0.191904
## lambda (gene 1): 1.28589
## epsilon (gene 1): -0.32371
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 11440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.197
## delta (gene 1): 13.6036
## s (cell 1): 1.05278
## nu (cell 1): 1.14727
## theta (batch 1): 0.0177109
## betas:    0.8574  -0.1239  -0.1432  -0.2186   0.8955   1.2535   1.0837   0.8530   1.5865   0.8140  -(
## 
## sigma: 0.177951
## lambda (gene 1): 0.655585
## epsilon (gene 1): -0.319151
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 11480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.405
## delta (gene 1): 15.7981
## s (cell 1): 0.719506
## nu (cell 1): 1.04488
## theta (batch 1): 0.0576467
## betas:    1.4601  -0.0763  -0.2958   0.2315   0.5990   0.7964   0.9406   0.8306   0.8892   0.9175  -(
## 
## sigma: 0.193212
## lambda (gene 1): 1.30323
## epsilon (gene 1): 0.218463
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 11520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 180.522
## delta (gene 1): 11.4503
## s (cell 1): 1.0805
## nu (cell 1): 1.02753
## theta (batch 1): 0.0284309
## betas:    1.5828  -0.2345  -0.4296   0.2245  -0.0149   1.0100   0.8323   0.8791   1.3917   0.8085  -(
##
## sigma: 0.176672
## lambda (gene 1): 1.10737
## epsilon (gene 1): -0.508096
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 11560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.081
## delta (gene 1): 18.9263
## s (cell 1): 1.15453
## nu (cell 1): 1.05448
## theta (batch 1): 0.0275831
## betas:    1.5198  -0.2032  -0.8286  -0.3406   1.3032   0.5337   0.8240   0.9173   1.3604   0.8018  -(
##
## sigma: 0.179636
## lambda (gene 1): 1.55845
## epsilon (gene 1): -0.169443
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 11600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.977
## delta (gene 1): 18.4756
## s (cell 1): 1.16372
## nu (cell 1): 1.09714
## theta (batch 1): 0.0288244
## betas:    2.0406  -0.2152  -0.3282   0.2320   0.1898   0.5578   0.8173   0.7613   1.1726   0.3525  -(
##
## sigma: 0.198302
## lambda (gene 1): 0.676288
## epsilon (gene 1): 0.353371
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
```

```
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 11640 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 161.761
## delta (gene 1): 14.0509
## s (cell 1): 1.11505
## nu (cell 1): 1.03467
## theta (batch 1): 0.0269818
## betas:    1.1675  -0.1229   0.3942   0.1232   0.4341   1.2825   0.7862   1.0171   1.3497   0.4398  -(
##
## sigma: 0.177401
## lambda (gene 1): 0.352194
## epsilon (gene 1): 0.0801833
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 11680 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.829
## delta (gene 1): 10.9835
## s (cell 1): 1.01778
## nu (cell 1): 1.02321
## theta (batch 1): 0.0124091
## betas:    0.8579  -0.0657   0.4271   0.7037   0.3367   1.7271   0.6209   1.3287   0.9633   0.9393  -(
##
## sigma: 0.177
## lambda (gene 1): 1.17256
## epsilon (gene 1): -0.215616
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ------------------------------------------------------------
## Iteration 11720 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.652
## delta (gene 1): 11.0353
## s (cell 1): 1.04822
## nu (cell 1): 1.04244
## theta (batch 1): 0.0114502
## betas:    1.6315  -0.1542   0.4516  -0.0069   0.1043   1.1242   0.9035   0.3716   1.6723   0.4021  -(
##
## sigma: 0.194588
```

```
## lambda (gene 1): 0.744354
## epsilon (gene 1): -0.760166
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 11760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.233
## delta (gene 1): 14.4071
## s (cell 1): 1.1194
## nu (cell 1): 1.06856
## theta (batch 1): 0.00588794
## betas:    1.4595  -0.1824  -0.2890  -0.6181   0.9629   0.7670   0.8224   0.9189   1.4161   0.5080   (
##
## sigma: 0.175407
## lambda (gene 1): 1.51356
## epsilon (gene 1): -0.00212307
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 11800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 247.3
## delta (gene 1): 13.01
## s (cell 1): 1.34852
## nu (cell 1): 1.11907
## theta (batch 1): 0.00655525
## betas:    1.5285  -0.2716   0.3157  -0.3186   0.3031   0.5628   1.3368   0.5266   1.7472   0.8162  -(
##
## sigma: 0.203321
## lambda (gene 1): 1.29088
## epsilon (gene 1): -0.215599
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 11840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.197
## delta (gene 1): 20.6711
```

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## s (cell 1): 1.02455
## nu (cell 1): 1.01317
## theta (batch 1): 0.0325009
## betas:    1.3339  -0.2238   0.2434  -0.4525   0.5837   1.0216   0.7733   1.2063   1.1902   1.0849  -(
##
## sigma: 0.193487
## lambda (gene 1): 0.345044
## epsilon (gene 1): 0.303061
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 11880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.164
## delta (gene 1): 17.5691
## s (cell 1): 1.25399
## nu (cell 1): 1.09228
## theta (batch 1): 0.0469479
## betas:    1.4489  -0.1759  -1.0271   0.2623   0.2561   0.9642   0.8537   0.8007   1.3572   1.0490  -(
##
## sigma: 0.185889
## lambda (gene 1): 1.40435
## epsilon (gene 1): -0.0864935
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 11920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 156.948
## delta (gene 1): 14.9087
## s (cell 1): 1.40884
## nu (cell 1): 1.0749
## theta (batch 1): 0.0285396
## betas:    0.8973  -0.1927  -0.0236   0.3232   0.3839   1.1219   1.0806   1.0931   1.5448   0.8893   (
##
## sigma: 0.189504
## lambda (gene 1): 0.723056
## epsilon (gene 1): 0.241804
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
```

```
## ---------------------------------------------------------
## Iteration 11960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.44
## delta (gene 1): 16.2768
## s (cell 1): 1.30579
## nu (cell 1): 1.09189
## theta (batch 1): 0.0237202
## betas:    1.3661  -0.1794   0.8123   0.2332   0.2096   1.2361   0.7081   1.0739   1.2396   0.7925  -0
##
## sigma: 0.17712
## lambda (gene 1): 1.78262
## epsilon (gene 1): 0.142256
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 12000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 286.05
## delta (gene 1): 15.1208
## s (cell 1): 0.986426
## nu (cell 1): 1.02484
## theta (batch 1): 0.00938228
## betas:    1.2617  -0.3107  -0.1695  -0.6100   0.6322   1.1931   0.6803   1.3024   1.5598   0.8872   0
##
## sigma: 0.193779
## lambda (gene 1): 2.73036
## epsilon (gene 1): 0.0886369
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 12040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.777
## delta (gene 1): 16.9517
## s (cell 1): 1.3071
## nu (cell 1): 1.07019
## theta (batch 1): 0.0258441
## betas:    1.1529  -0.1638  -0.0641   0.2653   0.6032   1.0376   1.1559   0.7880   1.4554   0.8088  -0
##
## sigma: 0.181172
## lambda (gene 1): 0.929205
## epsilon (gene 1): 0.222807
```

```
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 12080 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 295.523
## delta (gene 1): 18.2025
## s (cell 1): 1.51402
## nu (cell 1): 1.09261
## theta (batch 1): 0.0436884
## betas:    1.3090  -0.0812   0.0947  -0.0326   0.7347   1.0306   0.7776   0.9234   1.2343   0.4808  -(
##
## sigma: 0.184584
## lambda (gene 1): 0.653996
## epsilon (gene 1): -0.0190537
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ------------------------------------------------------------
## Iteration 12120 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.459
## delta (gene 1): 15.5239
## s (cell 1): 1.04345
## nu (cell 1): 1.11808
## theta (batch 1): 0.033652
## betas:    1.3915  -0.1319   0.2129  -0.4126   0.9424   1.0682   0.8043   0.7530   1.5267   0.2933  -(
##
## sigma: 0.182211
## lambda (gene 1): 2.91003
## epsilon (gene 1): -0.0825965
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 12160 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 293.04
## delta (gene 1): 15.188
## s (cell 1): 0.904815
## nu (cell 1): 1.05846
```

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## theta (batch 1): 0.0416737
## betas:    1.7867  -0.2399   0.2466  -0.4023   0.5696   1.0778   0.4815   1.0141   1.3810   0.4883  -(
##
## sigma: 0.181692
## lambda (gene 1): 0.705046
## epsilon (gene 1): -0.137025
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 12200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.711
## delta (gene 1): 16.2581
## s (cell 1): 1.03192
## nu (cell 1): 1.11024
## theta (batch 1): 0.0232592
## betas:    1.5272  -0.2002   0.1314   0.3706   0.0389   1.0439   1.0187   0.6193   1.6097   0.5260  -(
##
## sigma: 0.203749
## lambda (gene 1): 2.17746
## epsilon (gene 1): -0.0562796
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 12240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 271.825
## delta (gene 1): 13.2559
## s (cell 1): 1.09363
## nu (cell 1): 1.10496
## theta (batch 1): 0.0406335
## betas:    1.1387  -0.1583  -0.1378   0.8277   0.4380   0.9547   1.0341   1.0076   1.3165   0.7447  -(
##
## sigma: 0.185934
## lambda (gene 1): 0.331908
## epsilon (gene 1): -0.239644
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 12280 out of 40000 has been completed.
```

```
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 242.385
## delta (gene 1): 19.063
## s (cell 1): 1.04517
## nu (cell 1): 1.05742
## theta (batch 1): 0.0233867
## betas:    0.8983  -0.1472   0.5647   0.3809   0.1396   1.5363   1.0330   0.7713   1.8959   0.4423  -(
##
## sigma: 0.171271
## lambda (gene 1): 1.96949
## epsilon (gene 1): 0.0795486
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 12320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 312.869
## delta (gene 1): 16.8998
## s (cell 1): 0.925365
## nu (cell 1): 1.06079
## theta (batch 1): 0.0748153
## betas:    1.5244  -0.1992  -0.0159  -0.4735   0.7351   0.7716   0.9854   0.7698   1.3504   0.9807  -(
##
## sigma: 0.176946
## lambda (gene 1): 1.09488
## epsilon (gene 1): -0.043586
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 12360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.867
## delta (gene 1): 15.5008
## s (cell 1): 1.25875
## nu (cell 1): 1.03782
## theta (batch 1): 0.0162398
## betas:    0.7867  -0.1868   0.6375  -0.1491   0.7989   1.3464   0.9356   1.0709   1.8228   0.5931   (
##
## sigma: 0.179936
## lambda (gene 1): 1.35414
## epsilon (gene 1): 0.163878
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 12400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.191
## delta (gene 1): 14.1663
## s (cell 1): 1.06039
## nu (cell 1): 1.18577
## theta (batch 1): 0.0274083
## betas:    1.5491   -0.1248    0.2629   -0.0608    0.5839    0.9336    0.7912    0.8239    1.0898    0.8623   -
##
## sigma: 0.187986
## lambda (gene 1): 0.716393
## epsilon (gene 1): -0.308642
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 12440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.947
## delta (gene 1): 19.8399
## s (cell 1): 0.991198
## nu (cell 1): 1.03934
## theta (batch 1): 0.0626028
## betas:    1.6421   -0.1210   -0.2399    0.0021    0.1237    1.5452    0.2201    1.0427    1.1472    0.4529   -
##
## sigma: 0.181529
## lambda (gene 1): 0.405507
## epsilon (gene 1): 0.0229855
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 12480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.287
## delta (gene 1): 13.3514
## s (cell 1): 1.31342
## nu (cell 1): 1.02344
## theta (batch 1): 0.050195
## betas:    0.7080   -0.1241    0.0294   -0.1351    0.6041    1.3396    1.3387    0.8304    1.5024    0.9794   -
```

```
## 
## sigma: 0.181915
## lambda (gene 1): 0.359781
## epsilon (gene 1): -0.435152
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 12520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.22
## delta (gene 1): 13.3393
## s (cell 1): 0.987324
## nu (cell 1): 1.0632
## theta (batch 1): 0.0195899
## betas:    1.3933  -0.1692  -0.3791  -0.5478   0.8224   0.7418   1.1198   0.6059   1.6766   0.5139  -(
## 
## sigma: 0.180488
## lambda (gene 1): 0.727015
## epsilon (gene 1): -0.0809193
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 12560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 149.967
## delta (gene 1): 13.3462
## s (cell 1): 0.958146
## nu (cell 1): 1.07257
## theta (batch 1): 0.0401379
## betas:    1.1353  -0.1153   0.0149  -0.2401   0.7166   0.8002   1.1364   0.9085   1.1793   1.0439  -(
## 
## sigma: 0.180025
## lambda (gene 1): 0.564343
## epsilon (gene 1): 0.346576
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 12600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 179.989
## delta (gene 1): 14.0356
## s (cell 1): 0.944796
## nu (cell 1): 1.03074
## theta (batch 1): 0.0200844
## betas:    1.2851  -0.1642   0.1708   0.5411   0.0292   1.5114   0.8510   0.7146   1.5818   0.6495  -(
##
## sigma: 0.209662
## lambda (gene 1): 0.243298
## epsilon (gene 1): -0.325817
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 12640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 206.591
## delta (gene 1): 13.5766
## s (cell 1): 0.888292
## nu (cell 1): 1.03446
## theta (batch 1): 0.0191378
## betas:    1.2171  -0.2232   0.1529   0.4682   0.5044   1.3040   0.7909   1.1533   1.3326   0.9721  -(
##
## sigma: 0.179653
## lambda (gene 1): 1.73899
## epsilon (gene 1): -0.32387
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 12680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.25
## delta (gene 1): 11.995
## s (cell 1): 1.11291
## nu (cell 1): 1.06163
## theta (batch 1): 0.0113551
## betas:    1.2555  -0.1879   0.2596   0.1777   0.6472   1.1356   0.7944   1.1532   1.2828   0.6189  -(
##
## sigma: 0.185802
## lambda (gene 1): 0.263313
## epsilon (gene 1): -0.344574
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
```

```
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 12720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.796
## delta (gene 1): 15.0604
## s (cell 1): 1.28352
## nu (cell 1): 1.07174
## theta (batch 1): 0.0101023
## betas:    1.2783  -0.2092  -0.6991   0.1430   0.9499   0.7718   0.8913   1.1419   1.3144   0.8722  -(
##
## sigma: 0.173255
## lambda (gene 1): 1.40452
## epsilon (gene 1): 0.16797
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 12760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.072
## delta (gene 1): 10.1677
## s (cell 1): 1.32613
## nu (cell 1): 1.07069
## theta (batch 1): 0.0177797
## betas:    1.1736  -0.1039   0.1204  -0.2000   0.9280   0.6209   1.3850   0.4859   1.7187   0.3821  -(
##
## sigma: 0.181194
## lambda (gene 1): 0.953021
## epsilon (gene 1): -0.270526
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 12800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.529
## delta (gene 1): 16.234
## s (cell 1): 1.20394
## nu (cell 1): 1.08987
## theta (batch 1): 0.0209112
## betas:    1.2154  -0.0831  -0.1399   0.3841   0.3673   0.8688   1.5416   0.0860   1.8797   0.2084  -(
##
## sigma: 0.209697
```

```
## lambda (gene 1): 1.56533
## epsilon (gene 1): -0.209481
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 12840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 141.366
## delta (gene 1): 13.6028
## s (cell 1): 1.15608
## nu (cell 1): 1.10658
## theta (batch 1): 0.0395922
## betas:    0.9365  -0.1719   0.5094   0.8171   0.1639   0.8383   1.5244   0.6958   1.6907   0.7190
##
## sigma: 0.174901
## lambda (gene 1): 1.70946
## epsilon (gene 1): -0.350726
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 12880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.835
## delta (gene 1): 18.2766
## s (cell 1): 1.34279
## nu (cell 1): 1.0493
## theta (batch 1): 0.0263224
## betas:    0.9212  -0.1368   0.0009   0.3392   0.3189   1.2946   0.9908   1.0056   1.4302   0.8659  -0
##
## sigma: 0.186206
## lambda (gene 1): 0.964376
## epsilon (gene 1): 0.101114
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 12920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.32
## delta (gene 1): 14.3053
```

```
## s (cell 1): 2.18313
## nu (cell 1): 1.07919
## theta (batch 1): 0.0493372
## betas:    1.9375  -0.1412   0.0288   0.0586   0.0168   1.0103   0.5838   0.8241   1.0561   0.4697  -(
##
## sigma: 0.176318
## lambda (gene 1): 1.82883
## epsilon (gene 1): 0.226729
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 12960 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.987
## delta (gene 1): 14.8803
## s (cell 1): 0.951744
## nu (cell 1): 1.04381
## theta (batch 1): 0.0591245
## betas:    1.5916  -0.1702  -0.2453  -0.3226   1.1669   0.5374   1.1962   0.4489   1.5832   0.4034  -(
##
## sigma: 0.180787
## lambda (gene 1): 0.247469
## epsilon (gene 1): 0.324163
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -----------------------------------------------------------
## Iteration 13000 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 355.616
## delta (gene 1): 14.2874
## s (cell 1): 0.889677
## nu (cell 1): 1.05966
## theta (batch 1): 0.0441229
## betas:    1.0876  -0.2002  -0.3263  -0.2801   0.4349   1.3484   0.8009   0.9766   1.5782   0.9350  -(
##
## sigma: 0.195072
## lambda (gene 1): 0.371351
## epsilon (gene 1): 0.263275
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
```

```
## ---------------------------------------------------------
## Iteration 13040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.653
## delta (gene 1): 15.0616
## s (cell 1): 1.08824
## nu (cell 1): 1.05379
## theta (batch 1): 0.0716505
## betas:    1.1487  -0.1819   0.0422  -0.0940   0.2577   1.1712   0.9329   0.9347   1.4347   1.0664  -(
##
## sigma: 0.176724
## lambda (gene 1): 1.24695
## epsilon (gene 1): 0.331008
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 13080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.625
## delta (gene 1): 15.6017
## s (cell 1): 2.02409
## nu (cell 1): 1.17162
## theta (batch 1): 0.0526201
## betas:    1.2092  -0.1454   0.5275   0.1602   0.2072   1.4124   0.7444   1.1807   0.9879   1.0778  -(
##
## sigma: 0.188649
## lambda (gene 1): 0.338078
## epsilon (gene 1): -0.00379199
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 13120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.446
## delta (gene 1): 11.5518
## s (cell 1): 1.35593
## nu (cell 1): 1.07457
## theta (batch 1): 0.0265156
## betas:    1.2023  -0.1273   0.2763  -0.3436   1.0320   0.9863   0.9636   0.8968   1.3964   0.5275  -(
##
## sigma: 0.187819
## lambda (gene 1): 0.761651
## epsilon (gene 1): -0.587531
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 13160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 115.844
## delta (gene 1): 18.0907
## s (cell 1): 1.10586
## nu (cell 1): 1.11119
## theta (batch 1): 0.0201809
## betas:    0.9406  -0.1971   0.0710   0.3578  -0.0096   1.1306   1.2776   0.6656   1.8938   0.7316
##
## sigma: 0.185816
## lambda (gene 1): 0.742072
## epsilon (gene 1): 0.273388
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 13200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.489
## delta (gene 1): 13.6906
## s (cell 1): 1.27322
## nu (cell 1): 0.998153
## theta (batch 1): 0.0214649
## betas:    1.6795  -0.2176  -0.1646   0.2891  -0.1671   0.8547   1.0746   0.5843   1.3242   1.0325  -(
##
## sigma: 0.200451
## lambda (gene 1): 1.58184
## epsilon (gene 1): -0.166482
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 13240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.602
## delta (gene 1): 14.1426
## s (cell 1): 1.04652
## nu (cell 1): 1.09625
```

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## theta (batch 1): 0.00332518
## betas:     2.0228  -0.2467  -0.0070  -0.1673   0.0060   0.5523   0.9619   0.5939   1.3571   0.5316  -(
##
## sigma: 0.188184
## lambda (gene 1): 0.93869
## epsilon (gene 1): -0.122952
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 13280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 351.155
## delta (gene 1): 13.048
## s (cell 1): 1.10176
## nu (cell 1): 1.11165
## theta (batch 1): 0.00271339
## betas:     1.1781  -0.1130   0.5393   0.5807   0.0025   1.5703   0.8427   0.7949   1.5405   0.4081  -(
##
## sigma: 0.172544
## lambda (gene 1): 0.842174
## epsilon (gene 1): -0.0129508
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 13320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 329.558
## delta (gene 1): 13.942
## s (cell 1): 1.12866
## nu (cell 1): 1.09284
## theta (batch 1): 0.0031927
## betas:     1.7391  -0.2169   0.1576  -0.1022   0.5597   0.7520   0.6697   0.9419   1.3806   0.3968  -(
##
## sigma: 0.186591
## lambda (gene 1): 0.633985
## epsilon (gene 1): -0.360654
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 13360 out of 40000 has been completed.
```

```
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 221.467
## delta (gene 1): 16.8492
## s (cell 1): 1.16075
## nu (cell 1): 1.11771
## theta (batch 1): 0.00378031
## betas:    1.6855  -0.1691  -0.9632   0.0148   0.8129   0.3158   1.0542   0.8798   0.9520   1.0217  -(
##
## sigma: 0.173048
## lambda (gene 1): 1.04617
## epsilon (gene 1): 0.208818
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ------------------------------------------------------------
## Iteration 13400 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.649
## delta (gene 1): 13.4837
## s (cell 1): 1.0835
## nu (cell 1): 1.08602
## theta (batch 1): 0.000542676
## betas:    1.3549  -0.0922  -0.2998   0.0632   0.6057   1.1627   0.7638   0.9165   1.1559   0.5238  -(
##
## sigma: 0.206098
## lambda (gene 1): 1.09241
## epsilon (gene 1): -0.356917
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 13440 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.896
## delta (gene 1): 18.1004
## s (cell 1): 1.12997
## nu (cell 1): 1.04296
## theta (batch 1): 0.00138471
## betas:    1.0122  -0.0906   0.4447   0.0462   0.1865   1.7050   0.6020   1.0917   1.3786   0.4807  -(
##
## sigma: 0.193131
## lambda (gene 1): 2.90409
## epsilon (gene 1): -0.0803272
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 13480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.435
## delta (gene 1): 13.5073
## s (cell 1): 1.09154
## nu (cell 1): 1.11632
## theta (batch 1): 0.00176679
## betas:    1.3535  -0.2618  -0.1461  -0.2412   0.7859   0.8923   0.9831   1.0861   1.3632   0.9279  -(
##
## sigma: 0.172115
## lambda (gene 1): 1.58586
## epsilon (gene 1): -0.293186
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 13520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 361.216
## delta (gene 1): 14.0658
## s (cell 1): 1.07931
## nu (cell 1): 1.02504
## theta (batch 1): 0.00526874
## betas:    1.5275  -0.2648  -0.5867  -0.6318   1.3818   0.7048   0.6667   1.0236   1.7240   0.2573   (
##
## sigma: 0.179293
## lambda (gene 1): 1.05673
## epsilon (gene 1): 0.166815
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 13560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.032
## delta (gene 1): 13.0146
## s (cell 1): 1.18289
## nu (cell 1): 1.16159
## theta (batch 1): 0.010664
## betas:    1.3363  -0.1784  -0.1741   0.1432   0.4581   0.9165   0.9613   0.7820   1.6909   0.2924  -(
```

```
## 
## sigma: 0.186107
## lambda (gene 1): 1.34234
## epsilon (gene 1): -0.250606
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 13600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.722
## delta (gene 1): 16.2927
## s (cell 1): 1.05289
## nu (cell 1): 1.05334
## theta (batch 1): 0.00773642
## betas:    1.3946  -0.2081  -0.5367   0.4453   0.1134   1.4075   0.5778   0.9673   1.5440   0.6689  -(
## 
## sigma: 0.208311
## lambda (gene 1): 1.77041
## epsilon (gene 1): -0.0840151
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 13640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.894
## delta (gene 1): 12.7728
## s (cell 1): 1.37954
## nu (cell 1): 1.07935
## theta (batch 1): 0.0108299
## betas:    1.3212  -0.1357   0.0543  -0.2049  -0.0390   1.5192   0.5693   1.1741   1.1152   0.7152  -(
## 
## sigma: 0.178943
## lambda (gene 1): 0.80899
## epsilon (gene 1): -0.320192
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 13680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 155.724
## delta (gene 1): 15.5947
## s (cell 1): 0.968901
## nu (cell 1): 1.03393
## theta (batch 1): 0.0183691
## betas:     1.1522  -0.1242   0.0651   0.3886   0.3497   1.0207   1.0028   0.7130   1.7109   0.4792  -(
##
## sigma: 0.182043
## lambda (gene 1): 1.30529
## epsilon (gene 1): 0.389789
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 13720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.068
## delta (gene 1): 14.2553
## s (cell 1): 1.03826
## nu (cell 1): 1.04636
## theta (batch 1): 0.088499
## betas:     1.2278  -0.1026  -0.4895  -0.2369   1.3716   0.9447   0.9250   0.8878   1.2220   0.6340  -(
##
## sigma: 0.193569
## lambda (gene 1): 0.409941
## epsilon (gene 1): -0.283975
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 13760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 206.685
## delta (gene 1): 13.4935
## s (cell 1): 1.69092
## nu (cell 1): 1.16929
## theta (batch 1): 0.0517021
## betas:     1.1114  -0.1911  -0.2983  -0.1446   0.7487   1.1481   1.0059   0.9750   1.5005   0.8672  -(
##
## sigma: 0.191292
## lambda (gene 1): 1.03576
## epsilon (gene 1): -0.157049
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
```

```
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 13800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.947
## delta (gene 1): 11.4709
## s (cell 1): 1.06714
## nu (cell 1): 1.12028
## theta (batch 1): 0.0180108
## betas:    1.1266  -0.0982  -0.5100   0.0352   0.9157   1.2479   0.7469   1.0367   1.1612   0.7741  -(
##
## sigma: 0.212003
## lambda (gene 1): 0.726395
## epsilon (gene 1): -0.520509
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 13840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.217
## delta (gene 1): 10.8946
## s (cell 1): 0.993956
## nu (cell 1): 1.20603
## theta (batch 1): 0.00994312
## betas:    1.1353  -0.0631   0.0738  -0.0128   0.9287   0.9718   1.0456   0.7319   1.4354   0.3071  -(
##
## sigma: 0.187809
## lambda (gene 1): 0.733524
## epsilon (gene 1): -0.549164
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 13880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.528
## delta (gene 1): 11.6554
## s (cell 1): 0.94785
## nu (cell 1): 1.08515
## theta (batch 1): 0.0113562
## betas:    0.9784  -0.0555   0.5964   0.2602   0.3530   1.4469   0.7871   1.0829   1.1843   0.5948  -(
##
## sigma: 0.191433
```

```
## lambda (gene 1): 1.43889
## epsilon (gene 1): -0.222127
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 13920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.204
## delta (gene 1): 12.6328
## s (cell 1): 1.20853
## nu (cell 1): 1.09375
## theta (batch 1): 0.0134941
## betas:    1.6201  -0.2227  -0.2736  -0.5883   0.4564   0.8170   0.8865   1.0259   0.9906   1.1810  -(
##
## sigma: 0.184381
## lambda (gene 1): 1.21114
## epsilon (gene 1): -0.447307
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 13960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.408
## delta (gene 1): 14.1671
## s (cell 1): 1.1286
## nu (cell 1): 0.994969
## theta (batch 1): 0.0478228
## betas:    1.5172  -0.0639  -0.6106   0.3928  -0.2185   1.4864   0.5778   0.7758   1.2071   0.4813  -(
##
## sigma: 0.170489
## lambda (gene 1): 0.309444
## epsilon (gene 1): -0.0475864
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 14000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.861
## delta (gene 1): 15.3174
```

```
## s (cell 1): 1.57107
## nu (cell 1): 1.12896
## theta (batch 1): 0.051941
## betas:     1.4296  -0.1249  -0.5178  -0.2231   0.7018   0.9698   0.8584   0.7283   1.2888   0.7736  -(
##
## sigma: 0.193148
## lambda (gene 1): 1.73876
## epsilon (gene 1): -0.174483
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 14040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.462
## delta (gene 1): 15.9585
## s (cell 1): 0.788082
## nu (cell 1): 1.04225
## theta (batch 1): 0.0520469
## betas:     1.5187  -0.2831  -1.1748   0.0005   0.8138   0.4140   1.0805   0.9155   1.4817   0.8691   (
##
## sigma: 0.176095
## lambda (gene 1): 0.654137
## epsilon (gene 1): -0.124611
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 14080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 109.02
## delta (gene 1): 16.7842
## s (cell 1): 1.0462
## nu (cell 1): 1.10723
## theta (batch 1): 0.00967154
## betas:     1.8382  -0.1055   0.2877  -0.1575   0.5595   0.8178   0.4506   1.1752   0.5279   0.9052  -(
##
## sigma: 0.188738
## lambda (gene 1): 0.432511
## epsilon (gene 1): 0.0437421
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.5
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.3
```

```
## ---------------------------------------------------------
## Iteration 14120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 370.659
## delta (gene 1): 17.3883
## s (cell 1): 1.08151
## nu (cell 1): 1.07928
## theta (batch 1): 0.00499428
## betas:    1.1673  -0.0773  -0.3762   0.2912   1.2458   0.8658   0.9562   0.7537   1.4253   0.4925  -(
##
## sigma: 0.189203
## lambda (gene 1): 0.742354
## epsilon (gene 1): 0.306381
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 14160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.71
## delta (gene 1): 16.0227
## s (cell 1): 1.01138
## nu (cell 1): 1.07713
## theta (batch 1): 0.00583134
## betas:    0.9327  -0.1337   0.2447  -0.0699   0.5463   0.8260   1.4776   0.6994   1.5518   0.8924  -(
##
## sigma: 0.176208
## lambda (gene 1): 0.276902
## epsilon (gene 1): 0.213234
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.5
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 14200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 290.276
## delta (gene 1): 14.4046
## s (cell 1): 0.948626
## nu (cell 1): 1.13388
## theta (batch 1): 0.00500875
## betas:    1.2351  -0.0856   0.1073  -0.6141   0.5488   1.3630   0.6329   1.0931   1.0725   0.7150  -(
##
## sigma: 0.205913
## lambda (gene 1): 0.63288
## epsilon (gene 1): 0.0829935
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 14240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.503
## delta (gene 1): 13.5431
## s (cell 1): 0.940107
## nu (cell 1): 1.04289
## theta (batch 1): 0.00413185
## betas:    1.1117  -0.0719  -0.0559  -0.2388   0.6065   0.8766   1.1944   0.7502   1.3047   0.6436  -(
##
## sigma: 0.182467
## lambda (gene 1): 1.02879
## epsilon (gene 1): 0.0417999
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 14280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.559
## delta (gene 1): 17.2994
## s (cell 1): 0.977754
## nu (cell 1): 1.04723
## theta (batch 1): 0.00653044
## betas:    0.8340  -0.1691  -0.3986  -0.0364   0.8279   1.1729   0.7546   1.6304   1.0061   1.1260  -(
##
## sigma: 0.180162
## lambda (gene 1): 0.401204
## epsilon (gene 1): 0.0170447
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 14320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.849
## delta (gene 1): 12.7915
## s (cell 1): 1.1256
## nu (cell 1): 1.2163
```

```
## theta (batch 1): 0.00597117
## betas:    1.0695  -0.1352   0.3418   0.1610   0.8679   0.8678   0.9521   0.9656   1.5383   0.5373  -(
##
## sigma: 0.184041
## lambda (gene 1): 1.25514
## epsilon (gene 1): -0.32366
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 14360 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.394
## delta (gene 1): 10.9491
## s (cell 1): 1.16336
## nu (cell 1): 1.12732
## theta (batch 1): 0.0126636
## betas:    1.3761  -0.1310  -0.1832  -0.2101   0.3991   1.0806   0.8578   0.9525   1.1759   0.5588  -(
##
## sigma: 0.170999
## lambda (gene 1): 0.825522
## epsilon (gene 1): -0.486509
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ------------------------------------------------------------
## Iteration 14400 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.864
## delta (gene 1): 12.1677
## s (cell 1): 1.08333
## nu (cell 1): 1.01232
## theta (batch 1): 0.00720561
## betas:    0.9908  -0.0677   0.3392  -0.0372   0.5647   1.4997   0.8370   0.7522   1.6504   0.2928  -(
##
## sigma: 0.2071
## lambda (gene 1): 0.933505
## epsilon (gene 1): -0.640088
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 14440 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.661
## delta (gene 1): 13.3102
## s (cell 1): 0.916826
## nu (cell 1): 1.01079
## theta (batch 1): 0.00410429
## betas:    1.4964  -0.1362  -0.0777  -0.5798   0.5967   1.1432   0.7184   0.8346   1.3831   0.3706  -(
##
## sigma: 0.17732
## lambda (gene 1): 1.15387
## epsilon (gene 1): -0.540222
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 14480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.828
## delta (gene 1): 16.9628
## s (cell 1): 1.01851
## nu (cell 1): 1.04184
## theta (batch 1): 0.00375742
## betas:    1.1656  -0.0851  -0.6175  -0.0918   0.8646   1.2269   0.7252   0.9907   1.1965   0.8942  -(
##
## sigma: 0.197035
## lambda (gene 1): 1.37805
## epsilon (gene 1): -0.00806793
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 14520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.395
## delta (gene 1): 18.2322
## s (cell 1): 0.95847
## nu (cell 1): 1.00372
## theta (batch 1): 0.00101787
## betas:    1.0631  -0.1216  -0.3903   0.4611   0.2821   1.1275   1.0608   0.9509   1.2852   0.8269  -(
##
## sigma: 0.180602
## lambda (gene 1): 1.34424
## epsilon (gene 1): -0.0647036
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 14560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.78
## delta (gene 1): 16.2843
## s (cell 1): 1.19716
## nu (cell 1): 1.182
## theta (batch 1): 0.00258606
## betas:    1.7704  -0.1281   0.1349  -0.5638   0.0058   1.2916   0.5472   0.7457   1.2477   0.4485  -(
##
## sigma: 0.180192
## lambda (gene 1): 1.15124
## epsilon (gene 1): -0.0389236
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 14600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.57
## delta (gene 1): 14.5617
## s (cell 1): 1.00855
## nu (cell 1): 1.07473
## theta (batch 1): 0.00779047
## betas:    1.2222  -0.2209  -0.3213  -0.2157   0.5121   1.1625   0.7390   1.2568   1.1998   1.0692  -(
##
## sigma: 0.202851
## lambda (gene 1): 0.339153
## epsilon (gene 1): -0.337136
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 14640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 357.26
## delta (gene 1): 14.7125
## s (cell 1): 1.09596
## nu (cell 1): 1.06198
## theta (batch 1): 0.00939454
## betas:    1.1158  -0.2236   0.2798  -0.0670   1.4114   0.4383   1.3591   0.8568   1.6486   0.8520  -(
```

```
## 
## sigma: 0.179462
## lambda (gene 1): 1.48214
## epsilon (gene 1): -0.317942
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 14680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 156.225
## delta (gene 1): 11.805
## s (cell 1): 1.15669
## nu (cell 1): 1.06307
## theta (batch 1): 0.00665848
## betas:    1.2504  -0.1863   0.1531   0.2101   0.0883   1.4605   0.7095   0.9938   1.4821   0.6986  -(
## 
## sigma: 0.17873
## lambda (gene 1): 0.658323
## epsilon (gene 1): -0.431314
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 14720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.991
## delta (gene 1): 13.6129
## s (cell 1): 1.03942
## nu (cell 1): 1.10745
## theta (batch 1): 0.00504771
## betas:    1.6141  -0.1246   0.1427  -0.0172   0.4733   0.6412   1.0518   0.5095   1.3227   0.6981  -(
## 
## sigma: 0.186557
## lambda (gene 1): 1.22337
## epsilon (gene 1): -0.445138
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 14760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 239.366
## delta (gene 1): 15.4714
## s (cell 1): 1.12327
## nu (cell 1): 1.13195
## theta (batch 1): 0.00926099
## betas:    1.1206  -0.1325  -0.1382   0.4714   0.4655   1.1130   0.9835   0.9348   1.3857   0.7913  -(
##
## sigma: 0.176322
## lambda (gene 1): 0.789145
## epsilon (gene 1): -0.137047
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 14800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.927
## delta (gene 1): 16.4212
## s (cell 1): 1.12463
## nu (cell 1): 1.06457
## theta (batch 1): 0.00670876
## betas:    1.1947  -0.1382  -0.3346   0.5666  -0.1296   1.1409   1.3579   0.4357   1.5851   0.9566  -(
##
## sigma: 0.189357
## lambda (gene 1): 1.66114
## epsilon (gene 1): -0.257004
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 14840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 453.95
## delta (gene 1): 19.3014
## s (cell 1): 1.13704
## nu (cell 1): 1.0426
## theta (batch 1): 0.00356166
## betas:    1.3379  -0.1026   0.5530  -0.3445  -0.0222   1.3999   0.7340   1.0045   1.0019   0.9499  -(
##
## sigma: 0.185954
## lambda (gene 1): 1.32747
## epsilon (gene 1): -0.0809862
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
```

```
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 14880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 213.057
## delta (gene 1): 14.0729
## s (cell 1): 1.24177
## nu (cell 1): 1.08756
## theta (batch 1): 0.0186859
## betas:    1.2267  -0.1788   0.3674  -0.3609   0.3479   1.0495   0.7181   1.2005   1.0361   1.3871  -(
##
## sigma: 0.196298
## lambda (gene 1): 0.540376
## epsilon (gene 1): -0.117883
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 14920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.846
## delta (gene 1): 14.5582
## s (cell 1): 1.00738
## nu (cell 1): 1.04337
## theta (batch 1): 0.00930101
## betas:    1.5725  -0.2473  -0.2806   0.4284   0.6085   0.4677   1.1840   0.8749   1.2186   0.9856  -(
##
## sigma: 0.179863
## lambda (gene 1): 0.723484
## epsilon (gene 1): 0.151624
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 14960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.797
## delta (gene 1): 14.7768
## s (cell 1): 1.15317
## nu (cell 1): 1.06822
## theta (batch 1): 0.00568063
## betas:    0.8894  -0.1429   0.6146   0.4973   0.6343   0.7144   1.4172   0.8866   1.5137   0.7949  -(
##
## sigma: 0.178879
```

```
## lambda (gene 1): 0.731476
## epsilon (gene 1): -0.47013
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 15000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 308.967
## delta (gene 1): 12.7018
## s (cell 1): 0.955782
## nu (cell 1): 1.00689
## theta (batch 1): 0.00226949
## betas:    1.4314  -0.2599  -0.0396   0.5083   0.2798   0.8764   1.0604   0.9911   1.3016   1.0085  -(
##
## sigma: 0.199466
## lambda (gene 1): 0.135076
## epsilon (gene 1): -0.0165041
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 15040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.513
## delta (gene 1): 16.3568
## s (cell 1): 1.10145
## nu (cell 1): 1.11487
## theta (batch 1): 0.0107826
## betas:    1.5250  -0.0771   0.5237   0.6107   0.4704   0.9373   0.8012   0.7533   1.1937   0.1762  -(
##
## sigma: 0.189748
## lambda (gene 1): 1.14308
## epsilon (gene 1): 0.257204
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 15080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.903
## delta (gene 1): 17.5827
```

```
## s (cell 1): 1.17256
## nu (cell 1): 1.06712
## theta (batch 1): 0.00657056
## betas:    1.3137  -0.2097  -0.1062   0.0723   0.5805   1.0865   0.7186   1.1437   1.4251   0.5710
##
## sigma: 0.179452
## lambda (gene 1): 1.02957
## epsilon (gene 1): 0.152313
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 15120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.052
## delta (gene 1): 15.5143
## s (cell 1): 1.19835
## nu (cell 1): 1.13181
## theta (batch 1): 0.00348041
## betas:    1.1473  -0.2146  -0.0398  -0.0911   0.5975   1.0630   1.0484   0.8957   1.7206   0.5211
##
## sigma: 0.191373
## lambda (gene 1): 1.13798
## epsilon (gene 1): -0.160742
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 15160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.553
## delta (gene 1): 18.8997
## s (cell 1): 0.971679
## nu (cell 1): 1.04119
## theta (batch 1): 0.0146145
## betas:    1.4313  -0.2226   0.3121  -0.6008   0.3858   0.8774   0.9699   0.8410   1.5537   0.6863  -0
##
## sigma: 0.179137
## lambda (gene 1): 0.880663
## epsilon (gene 1): 0.147806
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
```

```
## ---------------------------------------------------------
## Iteration 15200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.741
## delta (gene 1): 15.0934
## s (cell 1): 1.09244
## nu (cell 1): 1.1264
## theta (batch 1): 0.00819711
## betas:    1.2877  -0.2056  -0.1527   0.0770   0.7846   1.0383   0.7760   1.0376   1.3760   0.9320  -(
##
## sigma: 0.203012
## lambda (gene 1): 0.350736
## epsilon (gene 1): -0.170105
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 15240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.09
## delta (gene 1): 15.3985
## s (cell 1): 1.14552
## nu (cell 1): 1.10142
## theta (batch 1): 0.00327902
## betas:    1.2026  -0.0772  -0.2199   0.4992   0.7537   0.7506   1.2141   0.5941   1.4820   0.3968  -(
##
## sigma: 0.176542
## lambda (gene 1): 0.306002
## epsilon (gene 1): -0.164713
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 15280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.107
## delta (gene 1): 12.9349
## s (cell 1): 1.03525
## nu (cell 1): 1.04622
## theta (batch 1): 0.00118915
## betas:    1.3046  -0.2019  -0.0763  -0.5858   0.4846   1.1926   0.6101   1.1938   1.4453   0.4545   (
##
## sigma: 0.179123
## lambda (gene 1): 2.57554
## epsilon (gene 1): 0.0294619
```

```
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 15320 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.386
## delta (gene 1): 15.9058
## s (cell 1): 0.999028
## nu (cell 1): 1.06312
## theta (batch 1): 0.00166048
## betas:    1.4261  -0.1577  -0.5904   0.1762   0.2821   1.0810   0.7884   1.1166   1.0133   0.7711  -(
##
## sigma: 0.180249
## lambda (gene 1): 0.813765
## epsilon (gene 1): -0.00879771
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 15360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 149.048
## delta (gene 1): 15.7969
## s (cell 1): 1.19291
## nu (cell 1): 1.08656
## theta (batch 1): 0.00131931
## betas:    1.5854  -0.1421  -0.0321  -0.6123   0.3381   1.0067   0.9634   0.5726   1.3969   0.6194  -(
##
## sigma: 0.18425
## lambda (gene 1): 0.295188
## epsilon (gene 1): 0.0251881
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 15400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.847
## delta (gene 1): 14.7149
## s (cell 1): 1.11001
## nu (cell 1): 1.08104
```

```
## theta (batch 1): 0.00137554
## betas:    1.6794  -0.1777  -0.1410  -0.2133  -0.3391   1.1942   0.9055   0.5298   1.4119   0.7186  -(
##
## sigma: 0.198995
## lambda (gene 1): 1.1094
## epsilon (gene 1): -0.0786402
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 15440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 343.844
## delta (gene 1): 15.5354
## s (cell 1): 0.987535
## nu (cell 1): 1.09603
## theta (batch 1): 0.00207895
## betas:    1.5529  -0.3484   0.3120  -0.3359  -0.1604   1.2252   0.7519   0.8918   1.7159   1.1255  -(
##
## sigma: 0.195281
## lambda (gene 1): 0.508755
## epsilon (gene 1): -0.0315005
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 15480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.515
## delta (gene 1): 13.0074
## s (cell 1): 1.12888
## nu (cell 1): 1.12951
## theta (batch 1): 0.00199187
## betas:    1.6772  -0.1182   0.2979   0.1119   0.0694   0.7484   1.0498   0.6465   0.9644   0.8776  -(
##
## sigma: 0.178029
## lambda (gene 1): 0.446552
## epsilon (gene 1): -0.0732004
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 15520 out of 40000 has been completed.
```

```
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.176
## delta (gene 1): 14.142
## s (cell 1): 1.08313
## nu (cell 1): 1.07389
## theta (batch 1): 0.000937438
## betas:    1.3312  -0.3228  -0.3704   0.3794   0.0030   0.8565   1.0095   1.0685   1.5793   1.1227  -(
##
## sigma: 0.179483
## lambda (gene 1): 4.21477
## epsilon (gene 1): -0.0540207
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 15560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 268.45
## delta (gene 1): 14.9233
## s (cell 1): 1.1326
## nu (cell 1): 1.11048
## theta (batch 1): 0.00375517
## betas:    1.4317  -0.1895   0.4848   0.1722  -0.3569   1.8828   0.2661   1.1720   1.2152   0.9512  -(
##
## sigma: 0.187585
## lambda (gene 1): 0.612835
## epsilon (gene 1): -0.276126
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 15600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.862
## delta (gene 1): 13.2756
## s (cell 1): 1.01807
## nu (cell 1): 0.967495
## theta (batch 1): 0.0214733
## betas:    0.9813  -0.2276   0.7444  -0.1999   0.7563   1.2875   0.8453   1.3198   1.5034   0.6153   (
##
## sigma: 0.202418
## lambda (gene 1): 1.44341
## epsilon (gene 1): 0.062869
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 15640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.996
## delta (gene 1): 11.8345
## s (cell 1): 1.25615
## nu (cell 1): 1.10869
## theta (batch 1): 0.0190324
## betas:    1.7275  -0.1898   0.7963  -0.2628   0.1588   0.9452   1.0169   0.6141   1.2819   0.6287  -
##
## sigma: 0.187334
## lambda (gene 1): 0.734367
## epsilon (gene 1): -0.0347033
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 15680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.036
## delta (gene 1): 19.0056
## s (cell 1): 1.35831
## nu (cell 1): 1.04309
## theta (batch 1): 0.0167299
## betas:    1.0343  -0.2525   0.2131  -0.0730   0.6175   1.5767   0.4840   1.5823   1.3836   0.7536   
##
## sigma: 0.174977
## lambda (gene 1): 1.10351
## epsilon (gene 1): -0.00132029
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 15720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.275
## delta (gene 1): 13.8742
## s (cell 1): 1.07708
## nu (cell 1): 1.04018
## theta (batch 1): 0.0134427
## betas:    1.4426  -0.1230  -0.2656   0.7500   0.2684   0.8685   0.9657   0.7170   1.2933   0.8203  -
```

```
## 
## sigma: 0.182901
## lambda (gene 1): 1.29308
## epsilon (gene 1): 0.0915075
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 15760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 133.408
## delta (gene 1): 14.7659
## s (cell 1): 0.908758
## nu (cell 1): 1.04705
## theta (batch 1): 0.00435476
## betas:     1.4090  -0.2278   0.3402   0.1030  -0.2309   1.1677   1.0625   0.7705   1.5419   0.8567  -(
## 
## sigma: 0.179707
## lambda (gene 1): 1.23891
## epsilon (gene 1): -0.108416
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 15800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 350.642
## delta (gene 1): 15.0885
## s (cell 1): 1.11653
## nu (cell 1): 1.13284
## theta (batch 1): 0.00491743
## betas:     1.3108  -0.1520   0.4082  -0.1098   0.9859   0.7056   0.8378   1.2343   0.9176   0.9621  -(
## 
## sigma: 0.198879
## lambda (gene 1): 1.04015
## epsilon (gene 1): 0.267176
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 15840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 233.682
## delta (gene 1): 16.4223
## s (cell 1): 1.246
## nu (cell 1): 1.08505
## theta (batch 1): 0.0110022
## betas:    1.4945  -0.2448   0.5782  -0.6282   0.5211   0.9190   0.9209   0.9084   1.5537   0.5145   (
##
## sigma: 0.181335
## lambda (gene 1): 0.79432
## epsilon (gene 1): 0.405776
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 15880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.56
## delta (gene 1): 17.9529
## s (cell 1): 1.02887
## nu (cell 1): 1.00917
## theta (batch 1): 0.0135312
## betas:    1.7505  -0.1211  -0.0984   0.7074   0.2500   0.6247   1.0052   0.6668   1.0619   0.6118   -(
##
## sigma: 0.180146
## lambda (gene 1): 1.16042
## epsilon (gene 1): -0.0822608
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 15920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.897
## delta (gene 1): 15.9258
## s (cell 1): 1.34662
## nu (cell 1): 1.12651
## theta (batch 1): 0.0171823
## betas:    1.7469  -0.2875  -0.2416  -0.4523   0.5168   0.4795   0.8581   1.0339   1.2869   0.9468   -(
##
## sigma: 0.181193
## lambda (gene 1): 1.81585
## epsilon (gene 1): -0.0739639
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 15960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 211.913
## delta (gene 1): 12.1121
## s (cell 1): 0.948928
## nu (cell 1): 0.966186
## theta (batch 1): 0.00607635
## betas:    1.0151    0.0404   -0.1909    0.0729    1.2160    0.9543    0.8252    1.0951    0.7209    1.0800   -
##
## sigma: 0.183022
## lambda (gene 1): 0.281497
## epsilon (gene 1): -0.368566
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.5
## --------------------------------------------------------
## Iteration 16000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 139.122
## delta (gene 1): 19.5478
## s (cell 1): 0.886984
## nu (cell 1): 1.08604
## theta (batch 1): 0.0241081
## betas:    1.6304   -0.2080    0.1220   -0.1196    0.0750    0.9069    1.1086    0.4313    1.5621    0.7814   -
##
## sigma: 0.19752
## lambda (gene 1): 2.19042
## epsilon (gene 1): -0.173879
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 16040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.703
## delta (gene 1): 15.9195
## s (cell 1): 0.650014
## nu (cell 1): 1.16386
## theta (batch 1): 0.0975735
## betas:    1.2242   -0.1651    0.2414   -0.0775    0.7360    0.8562    1.0366    1.0387    1.3046    0.6472   -
##
## sigma: 0.188993
```

```
## lambda (gene 1): 0.808138
## epsilon (gene 1): -0.32999
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 16080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.784
## delta (gene 1): 15.8415
## s (cell 1): 1.02447
## nu (cell 1): 1.04795
## theta (batch 1): 0.00670668
## betas:    1.8993  -0.2999  -0.1707  -0.3762   0.2750   0.7290   1.0026   0.6342   1.5977   0.6797  -(
##
## sigma: 0.173387
## lambda (gene 1): 1.6092
## epsilon (gene 1): -0.400119
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 16120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.24
## delta (gene 1): 14.6778
## s (cell 1): 1.09161
## nu (cell 1): 1.11087
## theta (batch 1): 0.00110259
## betas:    1.6264  -0.3012  -0.8166   0.2314   0.1100   1.1583   0.3864   1.3342   1.3191   0.9345  -(
##
## sigma: 0.186254
## lambda (gene 1): 0.992513
## epsilon (gene 1): -0.298068
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 16160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.594
## delta (gene 1): 16.668
```

```
## s (cell 1): 1.04942
## nu (cell 1): 1.01254
## theta (batch 1): 0.00108697
## betas:    1.2470  -0.1355  -0.2403   0.6221   0.2277   0.5763   1.4725   0.4391   1.6544   0.5978  -(
##
## sigma: 0.173849
## lambda (gene 1): 0.526376
## epsilon (gene 1): -0.101486
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ------------------------------------------------------------
## Iteration 16200 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.262
## delta (gene 1): 16.0165
## s (cell 1): 1.05674
## nu (cell 1): 1.06431
## theta (batch 1): 0.000342873
## betas:    0.8826  -0.1671   0.0579   0.0272   0.2753   1.8397   0.3893   1.6682   0.9842   1.2052  -(
##
## sigma: 0.20102
## lambda (gene 1): 0.982904
## epsilon (gene 1): 0.0062936
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 16240 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.353
## delta (gene 1): 13.9676
## s (cell 1): 1.06718
## nu (cell 1): 1.10103
## theta (batch 1): 0.00200658
## betas:    1.5825  -0.0866  -0.1786  -0.0691   0.2137   0.9358   1.0552   0.5307   1.0843   0.8478  -:
##
## sigma: 0.179809
## lambda (gene 1): 1.27519
## epsilon (gene 1): -0.116991
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
```

```
## ----------------------------------------------------------
## Iteration 16280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.82
## delta (gene 1): 17.2542
## s (cell 1): 1.08782
## nu (cell 1): 1.11838
## theta (batch 1): 0.00066999
## betas:    1.8437  -0.1864   0.2204  -0.5052   0.4489   0.7236   0.6668   1.1630   0.6447   1.0247  -(
##
## sigma: 0.185739
## lambda (gene 1): 1.85601
## epsilon (gene 1): -0.242557
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 16320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.041
## delta (gene 1): 13.6287
## s (cell 1): 1.05247
## nu (cell 1): 1.08441
## theta (batch 1): 0.000838308
## betas:    1.6085  -0.1824   0.0838  -0.1094   0.4438   0.9738   0.7078   0.9894   1.1332   0.8590  -(
##
## sigma: 0.183331
## lambda (gene 1): 1.03132
## epsilon (gene 1): 0.0951548
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 16360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.508
## delta (gene 1): 13.6865
## s (cell 1): 1.05546
## nu (cell 1): 1.07551
## theta (batch 1): 0.00180307
## betas:    1.3180  -0.2402  -0.6675   0.4845  -0.3335   1.3991   0.8698   1.0518   1.4400   0.7851   (
##
## sigma: 0.172822
## lambda (gene 1): 1.54873
## epsilon (gene 1): -0.421
```

```
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 16400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.614
## delta (gene 1): 15.6458
## s (cell 1): 1.04521
## nu (cell 1): 1.02179
## theta (batch 1): 0.0017129
## betas:    1.3808  -0.2664   0.0242  -0.4078  -0.0513   1.0542   1.2155   0.6028   1.5932   1.2007  -(
##
## sigma: 0.19286
## lambda (gene 1): 0.987942
## epsilon (gene 1): 0.0876806
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 16440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.195
## delta (gene 1): 18.8364
## s (cell 1): 0.976965
## nu (cell 1): 1.00919
## theta (batch 1): 0.001514
## betas:    1.4639  -0.1629   0.1439   0.4444   0.4774   0.2912   1.3105   0.6919   1.2856   0.8543  -(
##
## sigma: 0.182386
## lambda (gene 1): 0.646443
## epsilon (gene 1): 0.296231
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 16480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.349
## delta (gene 1): 16.5473
## s (cell 1): 1.08353
## nu (cell 1): 1.07566
```

```
## theta (batch 1): 0.00104447
## betas:    1.3407  -0.1448   0.3546   0.3477   0.0035   0.9046   1.2408   0.6273   1.3775   0.8551  -0
##
## sigma: 0.182792
## lambda (gene 1): 1.47045
## epsilon (gene 1): -0.0810492
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 16520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 134.7
## delta (gene 1): 11.8929
## s (cell 1): 1.05066
## nu (cell 1): 1.05774
## theta (batch 1): 0.00194019
## betas:    1.4791  -0.2305   0.0148  -0.3614   0.3898   1.2242   0.6805   0.7984   1.7068   0.5554  -0
##
## sigma: 0.175481
## lambda (gene 1): 0.97221
## epsilon (gene 1): 0.051956
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 16560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.679
## delta (gene 1): 15.6645
## s (cell 1): 0.974361
## nu (cell 1): 1.01003
## theta (batch 1): 0.0058339
## betas:    1.0202  -0.0657  -0.1235  -0.1822   1.0162   1.3142   0.7143   0.9010   1.4667   0.4227  -0
##
## sigma: 0.196196
## lambda (gene 1): 0.605733
## epsilon (gene 1): 0.208344
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 16600 out of 40000 has been completed.
```

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## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.55
## delta (gene 1): 13.3973
## s (cell 1): 1.10985
## nu (cell 1): 1.04949
## theta (batch 1): 0.00800118
## betas:    0.9011  -0.0338  -0.3019  -0.1552   0.6455   1.4862   0.6289   1.3725   0.7750   1.0541  -
##
## sigma: 0.192898
## lambda (gene 1): 1.00781
## epsilon (gene 1): -0.0380994
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 16640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.735
## delta (gene 1): 15.8965
## s (cell 1): 1.20888
## nu (cell 1): 1.11742
## theta (batch 1): 0.0104282
## betas:    0.8901   0.0091   0.0431  -0.1788   0.9926   0.6435   1.6949   0.2587   1.7010   0.2634  -(
##
## sigma: 0.1798
## lambda (gene 1): 1.35309
## epsilon (gene 1): 0.153288
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 16680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.69
## delta (gene 1): 12.0847
## s (cell 1): 0.905463
## nu (cell 1): 1.07915
## theta (batch 1): 0.0192469
## betas:    1.5168  -0.0657  -1.2347   0.2653   0.5563   1.1299   0.7543   0.7195   1.1511   0.3909  -(
##
## sigma: 0.18237
## lambda (gene 1): 0.244226
## epsilon (gene 1): -0.0611121
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 16720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 117.417
## delta (gene 1): 14.629
## s (cell 1): 1.14719
## nu (cell 1): 0.99884
## theta (batch 1): 0.00883082
## betas:    0.9229  -0.0880  -0.3861   0.2105   0.6507   1.0070   1.1944   0.7856   1.5004   0.6378  -(
##
## sigma: 0.175746
## lambda (gene 1): 1.30875
## epsilon (gene 1): -0.184876
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 16760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.484
## delta (gene 1): 12.6228
## s (cell 1): 1.06452
## nu (cell 1): 1.05214
## theta (batch 1): 0.0101078
## betas:    1.4280  -0.1700   0.4800  -0.4679   0.1674   0.9079   1.0992   0.7612   1.3594   0.7171  -(
##
## sigma: 0.187806
## lambda (gene 1): 1.5137
## epsilon (gene 1): 0.0204137
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 16800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 335.835
## delta (gene 1): 13.3969
## s (cell 1): 1.26711
## nu (cell 1): 1.07796
## theta (batch 1): 0.027528
## betas:    1.3247  -0.1679   0.0367   0.2833   0.4000   0.9437   0.9264   0.9668   1.1789   1.0516  -(
```

```
## 
## sigma: 0.187729
## lambda (gene 1): 0.749989
## epsilon (gene 1): 0.100496
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 16840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.87
## delta (gene 1): 15.9013
## s (cell 1): 0.854109
## nu (cell 1): 0.958591
## theta (batch 1): 0.0134509
## betas:    1.1948  -0.2030   0.9810  -0.4034   0.2849   1.5713   0.5982   1.1103   1.5334   0.6172
## 
## sigma: 0.178332
## lambda (gene 1): 1.00019
## epsilon (gene 1): 0.310874
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 16880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 282.053
## delta (gene 1): 20.187
## s (cell 1): 1.21198
## nu (cell 1): 1.09028
## theta (batch 1): 0.0133466
## betas:    1.3156  -0.1400   0.3435   0.1760   0.2511   0.5819   1.5317   0.3145   1.6510   0.7625  -(
## 
## sigma: 0.180583
## lambda (gene 1): 0.913864
## epsilon (gene 1): 0.288657
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 16920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 148.003
## delta (gene 1): 14.0976
## s (cell 1): 1.14017
## nu (cell 1): 1.01908
## theta (batch 1): 0.0214383
## betas:    1.6005  -0.2065   0.0025  -0.1581   0.6988   0.5714   0.9336   0.7279   1.3849   0.9201  -(
##
## sigma: 0.178288
## lambda (gene 1): 0.352248
## epsilon (gene 1): -0.0270512
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 16960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 566.664
## delta (gene 1): 18.7703
## s (cell 1): 1.22755
## nu (cell 1): 1.0384
## theta (batch 1): 0.0123851
## betas:    1.3792  -0.2809  -0.3570   0.1833   0.3575   0.7671   1.1119   0.8520   1.4716   1.2416  -(
##
## sigma: 0.183403
## lambda (gene 1): 1.90953
## epsilon (gene 1): -0.111825
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 17000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 149.727
## delta (gene 1): 18.8534
## s (cell 1): 1.13817
## nu (cell 1): 1.12809
## theta (batch 1): 0.00461438
## betas:    1.2779  -0.2723   0.5386   0.1822   0.7028   0.6189   1.2513   0.7553   1.7389   0.9100  -(
##
## sigma: 0.188221
## lambda (gene 1): 0.647962
## epsilon (gene 1): 0.155165
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 17040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.197
## delta (gene 1): 13.7925
## s (cell 1): 1.13174
## nu (cell 1): 1.0748
## theta (batch 1): 0.00766833
## betas:    1.9645  -0.2222   0.5600  -0.1307  -0.4065   0.8330   0.9836   0.3090   1.7871   0.1250  -(
##
## sigma: 0.174531
## lambda (gene 1): 1.01952
## epsilon (gene 1): -0.145384
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 17080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 333.69
## delta (gene 1): 10.2245
## s (cell 1): 1.17934
## nu (cell 1): 1.07565
## theta (batch 1): 0.00598945
## betas:    1.1939  -0.2485  -0.2185  -0.0237   0.5875   1.4699   0.3018   1.5777   1.2473   1.0670  -(
##
## sigma: 0.184637
## lambda (gene 1): 0.649891
## epsilon (gene 1): -0.639069
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 17120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.152
## delta (gene 1): 18.2367
## s (cell 1): 1.12735
## nu (cell 1): 1.07057
## theta (batch 1): 0.0100865
## betas:    1.2279  -0.3025  -0.0500  -0.2049   0.7770   0.9088   0.7066   1.6715   1.0292   1.4688  -(
##
## sigma: 0.174879
```

```
## lambda (gene 1): 1.07299
## epsilon (gene 1): -0.0714132
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 17160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 242.755
## delta (gene 1): 18.8524
## s (cell 1): 0.985513
## nu (cell 1): 1.08241
## theta (batch 1): 0.00596379
## betas:    1.1797  -0.1496   0.1462  -0.0831   0.7919   0.9572   0.9878   0.9230   1.2903   1.0260  -(
##
## sigma: 0.177236
## lambda (gene 1): 1.14267
## epsilon (gene 1): 0.0146901
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.3
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 17200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184
## delta (gene 1): 16.3899
## s (cell 1): 1.11672
## nu (cell 1): 1.09965
## theta (batch 1): 0.00687488
## betas:    1.4554  -0.1766   0.1209  -0.0951   0.3383   0.7984   0.8825   1.0068   1.1433   0.9153  -(
##
## sigma: 0.20479
## lambda (gene 1): 2.44695
## epsilon (gene 1): -0.129859
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 17240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 230.521
## delta (gene 1): 17.2437
```

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## s (cell 1): 1.19415
## nu (cell 1): 1.08005
## theta (batch 1): 0.0140595
## betas:    1.2022  -0.1691  -0.2414  -0.0247   0.3424   1.4035   0.7098   1.0390   1.3648   0.9192  -(
##
## sigma: 0.179919
## lambda (gene 1): 1.50884
## epsilon (gene 1): -0.0817338
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 17280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.416
## delta (gene 1): 16.7908
## s (cell 1): 1.23363
## nu (cell 1): 1.05896
## theta (batch 1): 0.0270234
## betas:    1.4834  -0.2219  -0.2448  -0.2095   0.2390   0.9812   0.7673   1.1605   1.0574   1.1398  -(
##
## sigma: 0.187234
## lambda (gene 1): 0.344009
## epsilon (gene 1): 0.035141
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 17320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 121.819
## delta (gene 1): 13.4189
## s (cell 1): 1.09408
## nu (cell 1): 1.08729
## theta (batch 1): 0.00615353
## betas:    0.8695  -0.0875   0.1218   0.4103   0.5851   1.1338   1.1901   0.9451   1.3130   0.8203  -(
##
## sigma: 0.174675
## lambda (gene 1): 1.37446
## epsilon (gene 1): -0.244151
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
```

```
## --------------------------------------------------------
## Iteration 17360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.025
## delta (gene 1): 11.0809
## s (cell 1): 1.13898
## nu (cell 1): 1.20623
## theta (batch 1): 0.00400502
## betas:    0.8927  -0.1715   0.0083  -0.5989   0.8254   1.3672   0.9303   0.9430   1.7176   0.7764  -(
##
## sigma: 0.186738
## lambda (gene 1): 1.92676
## epsilon (gene 1): -0.218845
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 17400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.925
## delta (gene 1): 11.6751
## s (cell 1): 0.970315
## nu (cell 1): 1.06735
## theta (batch 1): 0.0053719
## betas:    1.1124  -0.0862  -0.7069   0.0895   0.7604   0.9017   1.0907   0.6220   1.6462   0.4098  -(
##
## sigma: 0.198822
## lambda (gene 1): 1.04141
## epsilon (gene 1): -0.484214
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 17440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.73
## delta (gene 1): 16.2416
## s (cell 1): 1.0873
## nu (cell 1): 1.17791
## theta (batch 1): 0.0113126
## betas:    1.1851  -0.2245  -0.6473  -0.7068   0.6999   0.8382   1.3734   0.6524   1.8391   0.4665   (
##
## sigma: 0.177137
## lambda (gene 1): 1.72478
## epsilon (gene 1): -0.118587
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 17480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 288.9
## delta (gene 1): 10.7413
## s (cell 1): 1.48253
## nu (cell 1): 1.05455
## theta (batch 1): 0.0324957
## betas:    1.2473  -0.1585  -0.3804  -0.0104   0.1697   1.0330   1.1261   0.6854   1.4815   0.9434  -(
##
## sigma: 0.187967
## lambda (gene 1): 0.456901
## epsilon (gene 1): -0.770708
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 17520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 320.044
## delta (gene 1): 15.1835
## s (cell 1): 1.05438
## nu (cell 1): 1.09404
## theta (batch 1): 0.0190744
## betas:    1.2366   0.0146   0.1948  -0.0159   1.1570   0.9059   0.7715   0.9918   0.8726   0.5381  -(
##
## sigma: 0.189902
## lambda (gene 1): 0.566409
## epsilon (gene 1): 0.152601
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 17560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.428
## delta (gene 1): 14.001
## s (cell 1): 1.13709
## nu (cell 1): 1.08977
```

```
## theta (batch 1): 0.00620813
## betas:    1.3885  -0.1015  -0.1820   0.2301   0.4492   0.9172   0.9591   0.7276   1.3267   0.5571  -(
##
## sigma: 0.173812
## lambda (gene 1): 0.550733
## epsilon (gene 1): 0.231372
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 17600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.902
## delta (gene 1): 11.8116
## s (cell 1): 1.10089
## nu (cell 1): 1.10983
## theta (batch 1): 0.0156724
## betas:    0.8297  -0.1397   0.6592   0.3746   0.0692   1.2756   1.2704   0.6933   1.7771   0.8009  -(
##
## sigma: 0.200509
## lambda (gene 1): 0.523717
## epsilon (gene 1): -0.786004
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 17640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 115.285
## delta (gene 1): 17.3566
## s (cell 1): 1.32463
## nu (cell 1): 1.0494
## theta (batch 1): 0.0156835
## betas:    1.2443  -0.1681   0.1760   0.1817   0.9935   0.4198   1.0871   1.0907   1.2241   0.8148  -(
##
## sigma: 0.181562
## lambda (gene 1): 0.447782
## epsilon (gene 1): -0.383159
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 17680 out of 40000 has been completed.
```

```
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 248.5
## delta (gene 1): 17.7147
## s (cell 1): 1.41508
## nu (cell 1): 1.05994
## theta (batch 1): 0.0216753
## betas:    1.7971  -0.1805   0.0916  -0.1778   0.4535   1.0188   0.6622   0.8181   1.3293   0.2722  -(
##
## sigma: 0.177398
## lambda (gene 1): 1.69823
## epsilon (gene 1): 0.332405
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 17720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.04
## delta (gene 1): 16.2783
## s (cell 1): 1.17778
## nu (cell 1): 1.11429
## theta (batch 1): 0.0158541
## betas:    1.3474  -0.1566  -0.1479   0.0716   0.4543   0.9939   0.9976   0.9644   1.1402   0.8546  -(
##
## sigma: 0.184435
## lambda (gene 1): 1.06155
## epsilon (gene 1): 0.585635
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 17760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.823
## delta (gene 1): 13.2574
## s (cell 1): 1.26799
## nu (cell 1): 1.10121
## theta (batch 1): 0.0123748
## betas:    1.6068  -0.1694  -0.2595   0.5079   0.0981   1.1238   0.6226   0.8129   1.4123   0.5802  -(
##
## sigma: 0.183086
## lambda (gene 1): 0.787743
## epsilon (gene 1): -0.259299
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 17800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.247
## delta (gene 1): 20.0495
## s (cell 1): 1.26128
## nu (cell 1): 1.08346
## theta (batch 1): 0.0065914
## betas:    1.8853  -0.2663   0.1625   0.0738  -0.0059   0.6329   1.0911   0.4640   1.6309   0.5450  -(
##
## sigma: 0.194012
## lambda (gene 1): 1.05098
## epsilon (gene 1): 0.194801
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 17840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.116
## delta (gene 1): 15.386
## s (cell 1): 1.09173
## nu (cell 1): 1.05929
## theta (batch 1): 0.00260978
## betas:    1.6538  -0.2085   0.3627  -0.2089  -0.1329   1.2282   0.6906   0.8388   1.3015   0.9097  -(
##
## sigma: 0.178155
## lambda (gene 1): 1.28947
## epsilon (gene 1): -0.0472412
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 17880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 356.03
## delta (gene 1): 13.8312
## s (cell 1): 1.16017
## nu (cell 1): 1.02425
## theta (batch 1): 0.00279411
## betas:    1.3863  -0.2491  -0.1769  -0.2681   0.4939   0.9136   0.8971   1.1228   1.3863   0.7757   (
```

```
##
## sigma: 0.168973
## lambda (gene 1): 0.937808
## epsilon (gene 1): -0.278428
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 17920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.021
## delta (gene 1): 15.2689
## s (cell 1): 1.13897
## nu (cell 1): 1.12638
## theta (batch 1): 0.00444249
## betas:    1.6132  -0.2057   0.3734   0.1201  -0.4110   1.1075   0.9008   0.7846   1.2920   0.8601  -(
##
## sigma: 0.186616
## lambda (gene 1): 1.00132
## epsilon (gene 1): -0.185941
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 17960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.758
## delta (gene 1): 16.2138
## s (cell 1): 1.07564
## nu (cell 1): 1.04195
## theta (batch 1): 0.00125359
## betas:    1.2374  -0.0992   0.1243  -0.2798   1.1560   0.7619   0.9054   0.9561   1.3222   0.5028  -(
##
## sigma: 0.183314
## lambda (gene 1): 0.527281
## epsilon (gene 1): -0.163913
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 18000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 228.575
## delta (gene 1): 15.9297
## s (cell 1): 1.17708
## nu (cell 1): 1.04597
## theta (batch 1): 0.00248533
## betas:    2.0169  -0.2039  -0.0413  -0.8424   0.8215   0.6301   0.4152   1.1120   0.7983   0.8706  -(
##
## sigma: 0.202818
## lambda (gene 1): 0.615896
## epsilon (gene 1): -0.193789
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 18040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 284.603
## delta (gene 1): 18.2124
## s (cell 1): 0.928169
## nu (cell 1): 0.966484
## theta (batch 1): 0.00703286
## betas:    1.1060  -0.1971  -0.1081  -0.2911   0.9829   0.6403   1.4853   0.5731   1.7359   0.8892  -(
##
## sigma: 0.175417
## lambda (gene 1): 2.52108
## epsilon (gene 1): -0.0694764
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 18080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.484
## delta (gene 1): 13.5605
## s (cell 1): 1.07781
## nu (cell 1): 1.08746
## theta (batch 1): 0.00319149
## betas:    0.7914  -0.0696  -0.0571  -0.1632   0.6350   1.1830   0.8649   1.3173   1.1294   0.9091  -(
##
## sigma: 0.177779
## lambda (gene 1): 1.81439
## epsilon (gene 1): -0.168032
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
```

```
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 18120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 347.26
## delta (gene 1): 16.0783
## s (cell 1): 1.034
## nu (cell 1): 1.07487
## theta (batch 1): 0.00305558
## betas:    1.3953  -0.1971  -1.0699   0.2780   0.2853   1.1326   0.9537   0.7638   1.4794   0.8626  -(
##
## sigma: 0.186452
## lambda (gene 1): 0.926895
## epsilon (gene 1): 0.0965744
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 18160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.212
## delta (gene 1): 15.1151
## s (cell 1): 1.17814
## nu (cell 1): 1.09008
## theta (batch 1): 0.00909889
## betas:    1.8559  -0.1494   0.0280   0.3570   0.5318   0.5577   0.8800   0.5102   1.3939   0.4012  -(
##
## sigma: 0.188277
## lambda (gene 1): 1.29963
## epsilon (gene 1): -0.0705815
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 18200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.96
## delta (gene 1): 12.8274
## s (cell 1): 0.936821
## nu (cell 1): 1.04657
## theta (batch 1): 0.0157128
## betas:    0.9913  -0.0381   1.0639   0.4031   0.5940   1.2116   0.9767   0.7408   1.4893   0.3008  -(
##
## sigma: 0.201599
```

```
## lambda (gene 1): 1.72587
## epsilon (gene 1): -0.248032
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 18240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.787
## delta (gene 1): 12.4064
## s (cell 1): 0.938888
## nu (cell 1): 1.05131
## theta (batch 1): 0.0173194
## betas:    1.7895  -0.3051   0.1041  -0.4125  -0.1172   1.1175   0.8819   0.6769   1.6480   0.6879   (
##
## sigma: 0.175474
## lambda (gene 1): 0.66047
## epsilon (gene 1): -0.271589
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 18280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.312
## delta (gene 1): 12.8994
## s (cell 1): 0.835394
## nu (cell 1): 0.942281
## theta (batch 1): 0.0219168
## betas:    1.0739  -0.0402   0.5156   0.7129   0.3105   1.0305   1.1437   0.6879   1.3113   0.6281   -(
##
## sigma: 0.196962
## lambda (gene 1): 0.517624
## epsilon (gene 1): -0.0942891
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 18320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 426.447
## delta (gene 1): 16.4732
```

```
## s (cell 1): 0.878952
## nu (cell 1): 1.00188
## theta (batch 1): 0.0214806
## betas:    1.1106  -0.0313  -0.3060  -0.5075   1.3452   1.0146   0.6032   1.3997   0.6076   0.9715   -
##
## sigma: 0.180451
## lambda (gene 1): 0.329661
## epsilon (gene 1): -0.281344
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 18360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.102
## delta (gene 1): 15.6709
## s (cell 1): 1.08783
## nu (cell 1): 1.05391
## theta (batch 1): 0.0123965
## betas:    0.6659  -0.0412  -0.4703   0.2812   0.9593   1.1822   1.0248   1.1106   1.2655   0.6867   -
##
## sigma: 0.185127
## lambda (gene 1): 0.610816
## epsilon (gene 1): -0.251078
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 18400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.202
## delta (gene 1): 14.958
## s (cell 1): 0.912549
## nu (cell 1): 0.998075
## theta (batch 1): 0.00797955
## betas:    1.3886  -0.1734  -0.3044  -0.3032  -0.0933   1.2874   0.5997   1.1025   1.0863   1.2152   -
##
## sigma: 0.194979
## lambda (gene 1): 0.566104
## epsilon (gene 1): -0.108438
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
```

```
## ----------------------------------------------------------
## Iteration 18440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.056
## delta (gene 1): 15.1824
## s (cell 1): 1.09965
## nu (cell 1): 1.07938
## theta (batch 1): 0.00792923
## betas:    1.6395  -0.1556  -0.2065  -0.7062   0.7208   0.8686   1.0420   0.4423   1.3907   0.8140  -(
##
## sigma: 0.176376
## lambda (gene 1): 0.708365
## epsilon (gene 1): -0.12185
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 18480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.032
## delta (gene 1): 12.7171
## s (cell 1): 0.986993
## nu (cell 1): 0.97782
## theta (batch 1): 0.00326354
## betas:    1.5990  -0.1281  -0.0697  -0.1509   0.5342   1.2446   0.5147   0.8436   1.3172   0.2982  -(
##
## sigma: 0.195225
## lambda (gene 1): 0.994136
## epsilon (gene 1): -0.0200983
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 18520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 291.764
## delta (gene 1): 15.2741
## s (cell 1): 1.0514
## nu (cell 1): 1.04892
## theta (batch 1): 0.00367197
## betas:    1.0433  -0.1155   0.4813   0.1599   0.6293   1.1711   0.6431   1.3339   1.0316   1.1640  -(
##
## sigma: 0.185142
## lambda (gene 1): 1.67479
## epsilon (gene 1): -0.171802
```

```
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 18560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.18
## delta (gene 1): 16.3181
## s (cell 1): 0.951284
## nu (cell 1): 1.03858
## theta (batch 1): 0.0103047
## betas:    1.3841  -0.2387   0.0217   0.2464   0.7264   0.6629   0.9586   1.1168   1.2212   1.0577  -(
##
## sigma: 0.19255
## lambda (gene 1): 1.29154
## epsilon (gene 1): 0.161349
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 18600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 74.4682
## delta (gene 1): 23.088
## s (cell 1): 0.949463
## nu (cell 1): 1.03117
## theta (batch 1): 0.0039996
## betas:    1.8766  -0.1977   0.9659  -0.1783  -0.1398   1.1260   0.6735   0.7820   1.0665   0.8753  -(
##
## sigma: 0.20252
## lambda (gene 1): 0.242476
## epsilon (gene 1): 0.060385
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 18640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 373.226
## delta (gene 1): 14.9638
## s (cell 1): 0.992678
## nu (cell 1): 1.00546
```

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## theta (batch 1): 0.00378071
## betas:    1.5901  -0.1952   0.1599  -0.1746   0.5098   0.5038   1.2823   0.5081   1.6586   0.3378  -(
##
## sigma: 0.187236
## lambda (gene 1): 1.24948
## epsilon (gene 1): -0.340872
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 18680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 278.521
## delta (gene 1): 17.5586
## s (cell 1): 1.113
## nu (cell 1): 1.07436
## theta (batch 1): 0.00141009
## betas:    0.6586  -0.0893   0.0443   0.3005   1.3082   0.8098   1.1821   1.0382   1.5241   0.5515   (
##
## sigma: 0.178859
## lambda (gene 1): 1.72233
## epsilon (gene 1): -0.0354811
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 18720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 315.917
## delta (gene 1): 12.9039
## s (cell 1): 1.04848
## nu (cell 1): 1.00584
## theta (batch 1): 0.00241409
## betas:    1.4429  -0.2087   0.6360  -0.2673   0.5464   0.8369   0.8791   0.9530   1.4411   0.5497  -(
##
## sigma: 0.190748
## lambda (gene 1): 1.00967
## epsilon (gene 1): -0.40831
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 18760 out of 40000 has been completed.
```

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## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 169.98
## delta (gene 1): 12.3599
## s (cell 1): 1.05165
## nu (cell 1): 1.06081
## theta (batch 1): 0.00427079
## betas:    1.1083  -0.0913   0.1114   0.6813   0.4606   1.0232   0.9795   0.9222   1.3442   0.5915  -(
##
## sigma: 0.176113
## lambda (gene 1): 1.5718
## epsilon (gene 1): -0.0738937
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 18800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.411
## delta (gene 1): 13.3479
## s (cell 1): 1.08066
## nu (cell 1): 1.09151
## theta (batch 1): 0.00693663
## betas:    1.2472  -0.1061   0.0026   0.1249   0.6431   0.5770   1.1939   0.8748   1.0598   0.9198  -(
##
## sigma: 0.197466
## lambda (gene 1): 3.39362
## epsilon (gene 1): -0.14022
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 18840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.78
## delta (gene 1): 12.4919
## s (cell 1): 1.05839
## nu (cell 1): 1.09524
## theta (batch 1): 0.00679695
## betas:    1.4691  -0.1347  -0.0569   0.2302   0.3987   1.0201   0.7190   0.9953   1.2344   0.4282  -(
##
## sigma: 0.175155
## lambda (gene 1): 0.285122
## epsilon (gene 1): -0.211189
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 18880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.563
## delta (gene 1): 19.9227
## s (cell 1): 0.981454
## nu (cell 1): 1.05762
## theta (batch 1): 0.0209949
## betas:    1.2045  -0.1182   0.2389   0.2077   0.2959   1.3314   0.8976   0.8058   1.5346   0.3244  -(
##
## sigma: 0.18339
## lambda (gene 1): 0.935384
## epsilon (gene 1): 0.20128
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 18920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 156.783
## delta (gene 1): 14.5063
## s (cell 1): 1.22715
## nu (cell 1): 1.05634
## theta (batch 1): 0.0276007
## betas:    1.1806  -0.0582  -0.2611   0.3825   1.3598   0.7065   0.6937   1.3298   0.9219   0.5277  -(
##
## sigma: 0.175569
## lambda (gene 1): 1.11264
## epsilon (gene 1): -0.159019
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 18960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.11
## delta (gene 1): 19.7984
## s (cell 1): 1.15843
## nu (cell 1): 1.11452
## theta (batch 1): 0.011461
## betas:    1.1865  -0.2270   0.2311   0.1258   0.6108   0.8324   1.2220   0.8008   1.8282   0.4375   (
```

```
## 
## sigma: 0.17696
## lambda (gene 1): 1.44104
## epsilon (gene 1): 0.105666
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 19000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.644
## delta (gene 1): 17.8845
## s (cell 1): 1.00432
## nu (cell 1): 1.12085
## theta (batch 1): 0.0120833
## betas:    1.2248  -0.1932  -0.3445   0.2791   0.3882   1.1227   0.9346   0.9110   1.5155   0.7118  -(
## 
## sigma: 0.182268
## lambda (gene 1): 0.265906
## epsilon (gene 1): -0.233285
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 19040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.035
## delta (gene 1): 18.2148
## s (cell 1): 1.02666
## nu (cell 1): 0.968336
## theta (batch 1): 0.0145885
## betas:    1.2990  -0.1721   0.0151  -0.3921   0.8234   0.8013   0.8426   1.0051   1.4217   0.6243  -(
## 
## sigma: 0.181994
## lambda (gene 1): 0.758696
## epsilon (gene 1): -0.230383
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 19080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

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## mu (gene 1): 396.476
## delta (gene 1): 15.8594
## s (cell 1): 1.00269
## nu (cell 1): 1.02586
## theta (batch 1): 0.00675616
## betas:    0.9608  -0.2001   0.5575  -0.2475   0.5385   1.0506   1.0635   1.1646   1.3339   1.2754  -(
##
## sigma: 0.18299
## lambda (gene 1): 0.392978
## epsilon (gene 1): -0.0584054
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 19120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.483
## delta (gene 1): 13.8947
## s (cell 1): 1.23043
## nu (cell 1): 1.16791
## theta (batch 1): 0.00658136
## betas:    1.7139  -0.2440  -0.0083  -0.5743   0.0994   1.0460   0.7426   0.8509   1.2593   1.1078  -(
##
## sigma: 0.17532
## lambda (gene 1): 0.799444
## epsilon (gene 1): -0.060836
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 19160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.437
## delta (gene 1): 16.4819
## s (cell 1): 1.02939
## nu (cell 1): 0.982815
## theta (batch 1): 0.00848793
## betas:    0.8170  -0.1211  -0.2053   0.3211   0.4552   1.5369   0.5482   1.5471   1.0824   0.8783  -(
##
## sigma: 0.181383
## lambda (gene 1): 2.62365
## epsilon (gene 1): -0.250119
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
```

```
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 19200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 230.545
## delta (gene 1): 13.8048
## s (cell 1): 1.04586
## nu (cell 1): 1.05295
## theta (batch 1): 0.0187938
## betas:    0.8260  -0.1863  -0.3578  -0.1037   0.6244   1.2771   0.8855   1.3355   1.3630   1.0567  -(
##
## sigma: 0.197505
## lambda (gene 1): 1.08645
## epsilon (gene 1): -0.168487
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 19240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.044
## delta (gene 1): 14.2064
## s (cell 1): 0.963148
## nu (cell 1): 1.07301
## theta (batch 1): 0.0123666
## betas:    0.9477  -0.1240  -0.0040   0.7619   0.4974   1.2484   0.8703   1.2047   1.1555   1.0406  -(
##
## sigma: 0.185491
## lambda (gene 1): 0.452323
## epsilon (gene 1): -0.134591
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 19280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 155.014
## delta (gene 1): 12.6351
## s (cell 1): 1.06538
## nu (cell 1): 1.00723
## theta (batch 1): 0.0257665
## betas:    1.7923  -0.1946  -0.5761  -0.1530  -0.0945   1.1073   0.7709   0.6331   1.4641   0.5231  -(
##
## sigma: 0.179144
```

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## lambda (gene 1): 0.377034
## epsilon (gene 1): -0.177613
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 19320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.238
## delta (gene 1): 14.3164
## s (cell 1): 1.06793
## nu (cell 1): 1.05429
## theta (batch 1): 0.083185
## betas:    1.7859  -0.2643  -0.2142   0.1555   0.2915   0.5273   1.0107   0.6343   1.6976   0.4973  -(
##
## sigma: 0.179344
## lambda (gene 1): 0.508147
## epsilon (gene 1): -0.203998
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 19360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 99.7554
## delta (gene 1): 23.2307
## s (cell 1): 0.667412
## nu (cell 1): 1.0352
## theta (batch 1): 0.0450873
## betas:    1.4628  -0.2078  -0.2368   0.2778   1.1589   0.3910   1.1499   0.8582   1.3233   0.8458  -(
##
## sigma: 0.182511
## lambda (gene 1): 1.23787
## epsilon (gene 1): 0.149098
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 19400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.964
## delta (gene 1): 12.5071
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## s (cell 1): 1.1383
## nu (cell 1): 1.08923
## theta (batch 1): 0.0107915
## betas:    1.0713  -0.1607   0.6630   0.1166   0.5339   1.0202   1.0888   0.9595   1.3426   0.9106  -(
##
## sigma: 0.191013
## lambda (gene 1): 1.08206
## epsilon (gene 1): -0.351718
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 19440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.08
## delta (gene 1): 10.7174
## s (cell 1): 1.17478
## nu (cell 1): 1.09744
## theta (batch 1): 0.0133042
## betas:    1.2010  -0.1211   0.1315   0.6450   0.1727   1.2914   0.6370   1.1524   1.1682   0.8497  -(
##
## sigma: 0.186923
## lambda (gene 1): 0.72153
## epsilon (gene 1): -0.507229
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 19480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.57
## delta (gene 1): 18.2632
## s (cell 1): 1.15468
## nu (cell 1): 1.07781
## theta (batch 1): 0.00425903
## betas:    1.4836  -0.2067  -0.2725  -0.3516   0.6394   0.8914   0.8646   0.7440   1.6550   0.5542  -(
##
## sigma: 0.176767
## lambda (gene 1): 1.17505
## epsilon (gene 1): -0.0336843
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
```

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## ----------------------------------------------------------
## Iteration 19520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.035
## delta (gene 1): 13.5269
## s (cell 1): 1.1677
## nu (cell 1): 1.06211
## theta (batch 1): 0.00817507
## betas:    1.0398  -0.0107   0.5741   0.4453   0.0524   1.2972   1.0142   0.6682   1.3559   0.6176  -(
##
## sigma: 0.167656
## lambda (gene 1): 1.69695
## epsilon (gene 1): 0.0288768
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 19560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.572
## delta (gene 1): 16.3484
## s (cell 1): 1.22708
## nu (cell 1): 1.08369
## theta (batch 1): 0.0180881
## betas:    1.2548  -0.0433   0.0471   0.2110   0.6686   0.9401   1.0174   0.6409   1.3132   0.5643  -1
##
## sigma: 0.181408
## lambda (gene 1): 1.01957
## epsilon (gene 1): -0.0579835
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 19600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 301.478
## delta (gene 1): 13.5428
## s (cell 1): 1.3571
## nu (cell 1): 1.06201
## theta (batch 1): 0.0204073
## betas:    1.4609  -0.1758  -0.3357   0.0945   0.2659   1.1626   0.8307   0.9023   1.2081   0.8126  -(
##
## sigma: 0.201706
## lambda (gene 1): 1.8732
## epsilon (gene 1): -0.35281
```

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## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 19640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 380.012
## delta (gene 1): 13.0378
## s (cell 1): 1.05408
## nu (cell 1): 1.09153
## theta (batch 1): 0.0144539
## betas:    1.5011  -0.2158   0.6886  -0.3945   0.5011   1.1838   0.6458   1.1020   1.2892   0.6366  -(
##
## sigma: 0.183015
## lambda (gene 1): 1.00927
## epsilon (gene 1): -0.384895
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 19680 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.659
## delta (gene 1): 17.4711
## s (cell 1): 0.998519
## nu (cell 1): 1.06787
## theta (batch 1): 0.0220931
## betas:    1.9328  -0.3359  -0.1008   0.0478   0.0703   0.6763   0.5202   1.1972   1.1415   1.1332  -(
##
## sigma: 0.183596
## lambda (gene 1): 1.50658
## epsilon (gene 1): -0.192869
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ------------------------------------------------------
## Iteration 19720 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.311
## delta (gene 1): 16.6
## s (cell 1): 1.12877
## nu (cell 1): 0.992156
```

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## theta (batch 1): 0.0103737
## betas:    2.3370  -0.2851   0.7742  -0.8763   0.3385   0.5975   0.6819   0.7659   1.1235   0.5863  -
##
## sigma: 0.182558
## lambda (gene 1): 0.272366
## epsilon (gene 1): 0.109864
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 19760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 136.733
## delta (gene 1): 21.5088
## s (cell 1): 1.14305
## nu (cell 1): 1.08558
## theta (batch 1): 0.00406052
## betas:    1.5735  -0.1781   0.3265   0.1028   0.8042   0.7832   0.6662   1.2233   0.8734   0.9858  -
##
## sigma: 0.17332
## lambda (gene 1): 1.65352
## epsilon (gene 1): 0.128853
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 19800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.005
## delta (gene 1): 17.9579
## s (cell 1): 1.08038
## nu (cell 1): 1.10554
## theta (batch 1): 0.00384251
## betas:    1.4860  -0.1967  -0.1681   0.6641  -0.0928   0.8592   1.3328   0.4060   1.6404   0.6355  -
##
## sigma: 0.194004
## lambda (gene 1): 1.22573
## epsilon (gene 1): -0.0826067
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 19840 out of 40000 has been completed.
```

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## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.412
## delta (gene 1): 18.0997
## s (cell 1): 1.28342
## nu (cell 1): 1.07729
## theta (batch 1): 0.005279
## betas:    1.9584  -0.2393   0.8171   0.0175   0.1051   0.4849   1.0445   0.4396   1.6365   0.3228  -(
##
## sigma: 0.184741
## lambda (gene 1): 0.965597
## epsilon (gene 1): -0.0612414
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 19880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.666
## delta (gene 1): 14.3584
## s (cell 1): 1.1733
## nu (cell 1): 1.08229
## theta (batch 1): 0.00810542
## betas:    1.9257  -0.2882   0.4534   0.4036  -0.1415   0.5061   1.0439   0.8917   1.1516   0.9040  -(
##
## sigma: 0.18335
## lambda (gene 1): 1.03915
## epsilon (gene 1): 0.376276
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 19920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.765
## delta (gene 1): 12.073
## s (cell 1): 1.11892
## nu (cell 1): 1.03951
## theta (batch 1): 0.00535207
## betas:    1.8590  -0.2535   0.5527   0.1151  -0.1750   0.6732   1.2375   0.3981   1.5101   0.8531  -(
##
## sigma: 0.186962
## lambda (gene 1): 1.05798
## epsilon (gene 1): -0.210422
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

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## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 19960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.132
## delta (gene 1): 17.1366
## s (cell 1): 0.979071
## nu (cell 1): 1.05459
## theta (batch 1): 0.0034259
## betas:    1.1031  -0.1734  -0.0237  -0.2952   0.3568   1.0921   0.9440   0.7538   1.7594   0.7142  -0
##
## sigma: 0.189063
## lambda (gene 1): 0.541112
## epsilon (gene 1): 0.571153
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## End of Burn-in period.
## --------------------------------------------------------
## --------------------------------------------------------
## Iteration 20000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.082
## delta (gene 1): 9.7091
## s (cell 1): 1.0951
## nu (cell 1): 1.13034
## theta (batch 1): 0.00633895
## betas:    1.5448  -0.1320  -0.5409   0.4722   0.2221   0.9940   0.9021   0.7966   1.0669   0.6767  -0
##
## sigma: 0.191272
## lambda (gene 1): 0.738318
## epsilon (gene 1): -0.47211
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 20040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.612
## delta (gene 1): 10.239
## s (cell 1): 1.1046
```

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## nu (cell 1): 1.10287
## theta (batch 1): 0.00155706
## betas:    2.1804  -0.3985  -1.2080  -0.4302  -0.2268   1.3265   0.6157   0.7024   1.7452   0.5556  -
##
## sigma: 0.176004
## lambda (gene 1): 1.3923
## epsilon (gene 1): -0.383022
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 20080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 147.181
## delta (gene 1): 17.898
## s (cell 1): 1.06042
## nu (cell 1): 1.08602
## theta (batch 1): 0.002916
## betas:    1.0666  -0.0622   0.1889   0.1933   1.0685   1.0647   1.1058   0.8139   1.1517   0.6859  -
##
## sigma: 0.187301
## lambda (gene 1): 1.03968
## epsilon (gene 1): 0.181093
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 20120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.555
## delta (gene 1): 16.6097
## s (cell 1): 1.05326
## nu (cell 1): 1.11216
## theta (batch 1): 0.00424361
## betas:    1.2856  -0.1772   0.2896  -0.2662   0.5469   1.2818   0.9566   0.7181   1.6525   0.4313  -
##
## sigma: 0.188929
## lambda (gene 1): 2.33553
## epsilon (gene 1): 0.0930088
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
```

```
## Iteration 20160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.389
## delta (gene 1): 11.5368
## s (cell 1): 1.0408
## nu (cell 1): 1.06752
## theta (batch 1): 0.00316745
## betas:    0.8463  -0.1539   0.0672  -0.1680   1.0011   1.3804   0.8128   1.3240   1.1980   1.0120  -(
##
## sigma: 0.181634
## lambda (gene 1): 1.12821
## epsilon (gene 1): -0.281125
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 20200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.524
## delta (gene 1): 16.2837
## s (cell 1): 0.991575
## nu (cell 1): 1.00828
## theta (batch 1): 0.000653678
## betas:    1.0464  -0.1873  -0.0112  -0.5006   1.0790   1.0299   0.9565   1.2182   1.2209   0.9304  -(
##
## sigma: 0.188274
## lambda (gene 1): 0.876482
## epsilon (gene 1): 0.0570605
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 20240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 346.251
## delta (gene 1): 17.897
## s (cell 1): 1.08731
## nu (cell 1): 1.05828
## theta (batch 1): 0.000691055
## betas:    1.2762  -0.2284  -0.5287  -0.0103   0.5959   0.9657   1.4180   0.4258   1.8829   0.6387  -(
##
## sigma: 0.174793
## lambda (gene 1): 1.40485
## epsilon (gene 1): 0.151967
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 20280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.696
## delta (gene 1): 14.7627
## s (cell 1): 1.21452
## nu (cell 1): 1.15299
## theta (batch 1): 0.00106015
## betas:     1.1474   -0.0623   -0.3648    0.2449    0.8105    1.0426    0.9508    1.0048    0.9131    0.7464   -(
##
## sigma: 0.17891
## lambda (gene 1): 0.732225
## epsilon (gene 1): -0.0126757
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 20320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.98
## delta (gene 1): 15.2499
## s (cell 1): 1.21093
## nu (cell 1): 1.20951
## theta (batch 1): 0.00376397
## betas:     1.2385   -0.1678   -0.1476   -0.1826    0.5993    1.1713    1.1175    0.5865    1.7400    0.3215   -(
##
## sigma: 0.18654
## lambda (gene 1): 0.682517
## epsilon (gene 1): 0.0196539
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 20360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 125.53
## delta (gene 1): 11.7175
## s (cell 1): 0.863903
## nu (cell 1): 1.05696
## theta (batch 1): 0.0130791
```

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## betas:    1.3578  -0.2114  -0.4681  -0.6996   0.6203   1.5962   0.5661   1.0017   1.6085   0.2951   (
##
## sigma: 0.195124
## lambda (gene 1): 0.325653
## epsilon (gene 1): -0.257551
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 20400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 271.541
## delta (gene 1): 14.2535
## s (cell 1): 1.09595
## nu (cell 1): 1.07228
## theta (batch 1): 0.00550678
## betas:    0.8148   0.0167   0.3897   0.0103   1.1699   1.0429   1.1988   0.6999   1.2796   0.4234   -
##
## sigma: 0.194385
## lambda (gene 1): 0.751712
## epsilon (gene 1): -0.0746821
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 20440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.336
## delta (gene 1): 13.3709
## s (cell 1): 1.15032
## nu (cell 1): 1.11158
## theta (batch 1): 0.0030062
## betas:    0.9367  -0.0797   0.0732   0.0618   0.8725   1.2156   1.0003   0.9880   1.1834   0.7986   -
##
## sigma: 0.184904
## lambda (gene 1): 0.731613
## epsilon (gene 1): -0.13353
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 20480 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.031
## delta (gene 1): 10.6744
## s (cell 1): 0.959758
## nu (cell 1): 1.04017
## theta (batch 1): 0.00975552
## betas:    0.5168  -0.1039   0.2803   0.5811   0.6029   1.4025   1.2399   1.0822   1.4372   0.8914  -(
##
## sigma: 0.175492
## lambda (gene 1): 0.396297
## epsilon (gene 1): -0.35475
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 20520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.33
## delta (gene 1): 12.4588
## s (cell 1): 0.995633
## nu (cell 1): 1.08703
## theta (batch 1): 0.00980218
## betas:    1.0016  -0.2018  -0.5197  -0.3666   0.6493   1.7700   0.4312   1.6633   0.9747   1.0693  -(
##
## sigma: 0.178035
## lambda (gene 1): 0.319787
## epsilon (gene 1): -0.181513
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 20560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 199.065
## delta (gene 1): 15.82
## s (cell 1): 0.839691
## nu (cell 1): 1.07099
## theta (batch 1): 0.00862281
## betas:    0.7073  -0.0446  -0.1708  -0.0904   1.1390   1.5161   0.6446   1.4839   0.7346   1.0849  -(
##
## sigma: 0.19576
## lambda (gene 1): 0.468052
## epsilon (gene 1): 0.0486208
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

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## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 20600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.135
## delta (gene 1): 15.0771
## s (cell 1): 1.29299
## nu (cell 1): 1.12239
## theta (batch 1): 0.00915555
## betas:    0.8539  -0.0594  -0.4070   0.1005   1.2567   1.2738   0.8661   0.9999   1.3100   0.5318  -(
##
## sigma: 0.188883
## lambda (gene 1): 1.38807
## epsilon (gene 1): -0.00971788
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 20640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.487
## delta (gene 1): 13.6155
## s (cell 1): 1.23191
## nu (cell 1): 1.13341
## theta (batch 1): 0.00558043
## betas:    1.2526  -0.0812  -0.2532   0.4548   0.4931   1.1308   1.1498   0.5777   1.2885   0.5992  -(
##
## sigma: 0.181698
## lambda (gene 1): 2.08975
## epsilon (gene 1): -0.111012
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 20680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 219.105
## delta (gene 1): 13.3813
## s (cell 1): 1.03967
## nu (cell 1): 1.07891
## theta (batch 1): 0.00665355
## betas:    1.6422  -0.1804  -0.2116  -0.9919   1.0317   0.9971   0.7438   0.6762   1.5468   0.2503  -(
##
```

```
## sigma: 0.180601
## lambda (gene 1): 1.1935
## epsilon (gene 1): -0.121327
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 20720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.074
## delta (gene 1): 10.225
## s (cell 1): 1.03688
## nu (cell 1): 1.01583
## theta (batch 1): 0.00536491
## betas:    1.0630  -0.0365   0.2623  -0.3228   1.1478   1.1221   1.1059   0.6282   1.3839   0.3308  -(
##
## sigma: 0.179808
## lambda (gene 1): 1.60761
## epsilon (gene 1): -0.392848
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 20760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.357
## delta (gene 1): 12.8789
## s (cell 1): 0.891696
## nu (cell 1): 1.03292
## theta (batch 1): 0.0189303
## betas:    0.7563  -0.1898   0.1343  -0.3737   0.8862   1.5193   0.7678   1.5720   1.0993   1.2343  -(
##
## sigma: 0.183813
## lambda (gene 1): 0.582757
## epsilon (gene 1): -0.156189
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 20800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.909
```

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## delta (gene 1): 17.0898
## s (cell 1): 1.01288
## nu (cell 1): 1.05401
## theta (batch 1): 0.0228138
## betas:    1.3269  -0.2054  -0.7371  -0.2414   0.8549   1.2037   0.6601   1.2134   1.3147   0.4959  -(
##
## sigma: 0.178789
## lambda (gene 1): 1.92905
## epsilon (gene 1): 0.159659
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 20840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.248
## delta (gene 1): 16.2581
## s (cell 1): 1.04787
## nu (cell 1): 1.1437
## theta (batch 1): 0.0179426
## betas:    0.6967  -0.1501  -0.9573   0.3199   1.0661   1.1307   1.3227   0.9837   1.5070   0.9205  -(
##
## sigma: 0.196663
## lambda (gene 1): 3.39202
## epsilon (gene 1): 0.0742653
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 20880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.623
## delta (gene 1): 12.5144
## s (cell 1): 0.937038
## nu (cell 1): 1.02465
## theta (batch 1): 0.0298537
## betas:    0.6477  -0.0217  -0.7030   0.5331   0.7872   1.4599   1.1455   0.8140   1.4015   0.5013  -(
##
## sigma: 0.183915
## lambda (gene 1): 1.7741
## epsilon (gene 1): -0.201003
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 20920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 153.64
## delta (gene 1): 14.953
## s (cell 1): 1.1226
## nu (cell 1): 1.11697
## theta (batch 1): 0.0329129
## betas:    1.0535  -0.1206  -0.6005  -0.0886   0.9752   1.2135   0.7932   1.1454   1.2282   0.6351  -(
##
## sigma: 0.185503
## lambda (gene 1): 0.388855
## epsilon (gene 1): -0.00589898
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 20960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 304.694
## delta (gene 1): 19.1218
## s (cell 1): 1.03197
## nu (cell 1): 0.998611
## theta (batch 1): 0.0127371
## betas:    1.2280  -0.1523   0.1365   0.0108   0.4574   1.1368   1.2078   0.5959   1.6626   0.3578  -(
##
## sigma: 0.180694
## lambda (gene 1): 0.472795
## epsilon (gene 1): 0.23137
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 21000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.696
## delta (gene 1): 12.6317
## s (cell 1): 1.10794
## nu (cell 1): 1.06429
## theta (batch 1): 0.0109146
## betas:    0.8991  -0.1742  -0.1653  -0.0274   1.2461   0.8376   1.4215   0.8143   1.5267   0.9669  -(
##
## sigma: 0.18815
## lambda (gene 1): 0.975412
```

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## epsilon (gene 1): -0.186613
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 21040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.892
## delta (gene 1): 15.8123
## s (cell 1): 0.873327
## nu (cell 1): 1.03917
## theta (batch 1): 0.0101054
## betas:    1.3459  -0.2024   0.0071  -0.3781   0.7598   1.0855   0.8495   1.0431   1.3705   0.5141  -(
##
## sigma: 0.186438
## lambda (gene 1): 2.68233
## epsilon (gene 1): 0.0634916
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 21080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 125.166
## delta (gene 1): 11.5411
## s (cell 1): 1.39595
## nu (cell 1): 1.10407
## theta (batch 1): 0.0157844
## betas:    0.7682  -0.1219  -0.0375   0.3268   0.9725   1.1014   1.1281   1.0993   1.3277   0.8022  -(
##
## sigma: 0.178513
## lambda (gene 1): 0.439041
## epsilon (gene 1): -0.269599
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 21120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 188.027
## delta (gene 1): 12.885
## s (cell 1): 1.10798
```

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## nu (cell 1): 1.05515
## theta (batch 1): 0.00708493
## betas:    1.1388  -0.1857   0.4893  -0.0564   0.2899   1.7771   0.3712   1.5029   1.0512   1.0324  -0
##
## sigma: 0.18877
## lambda (gene 1): 0.455746
## epsilon (gene 1): -0.160989
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 21160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.595
## delta (gene 1): 18.7841
## s (cell 1): 1.01485
## nu (cell 1): 1.07137
## theta (batch 1): 0.00291627
## betas:    1.2742  -0.1171   0.1189  -0.5862   1.0638   1.0941   0.7613   1.0337   1.2246   0.3887  -0
##
## sigma: 0.179601
## lambda (gene 1): 3.05559
## epsilon (gene 1): 0.231127
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 21200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.782
## delta (gene 1): 12.3851
## s (cell 1): 1.14464
## nu (cell 1): 1.08303
## theta (batch 1): 0.00398019
## betas:    1.2450  -0.2531  -0.2735  -0.0848   0.7220   1.1514   0.9591   1.0359   1.6046   0.6099   0
##
## sigma: 0.179407
## lambda (gene 1): 1.03838
## epsilon (gene 1): -0.205772
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
```

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## Iteration 21240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.87
## delta (gene 1): 16.8119
## s (cell 1): 0.942852
## nu (cell 1): 1.08844
## theta (batch 1): 0.00944708
## betas:    1.7905  -0.1893  -0.0486   0.0602   0.2043   1.1381   0.7316   0.7679   1.2164   0.5105  -(
##
## sigma: 0.190734
## lambda (gene 1): 1.96682
## epsilon (gene 1): 0.0904732
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 21280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 287.722
## delta (gene 1): 15.9993
## s (cell 1): 1.18405
## nu (cell 1): 1.12002
## theta (batch 1): 0.00366538
## betas:    1.3416  -0.2206  -0.7794   0.0438   0.4639   1.2106   0.9825   0.9714   1.3077   0.8937  -(
##
## sigma: 0.19561
## lambda (gene 1): 0.787423
## epsilon (gene 1): 0.0689559
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 21320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.773
## delta (gene 1): 17.6359
## s (cell 1): 1.18257
## nu (cell 1): 1.13339
## theta (batch 1): 0.00416135
## betas:    1.1523  -0.0922  -0.7597   0.4405   0.5938   1.2929   0.9328   0.8010   1.2871   0.6838  -
##
## sigma: 0.184121
## lambda (gene 1): 1.15644
## epsilon (gene 1): 0.168634
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 21360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.577
## delta (gene 1): 18.6027
## s (cell 1): 0.951576
## nu (cell 1): 1.01004
## theta (batch 1): 0.00505582
## betas:    0.9540  -0.0809  -0.6389   0.6802   0.5335   1.1501   1.3982   0.4812   1.6777   0.3128  -(
##
## sigma: 0.17894
## lambda (gene 1): 0.89567
## epsilon (gene 1): 0.186847
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 21400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 161.581
## delta (gene 1): 17.3061
## s (cell 1): 1.10262
## nu (cell 1): 1.1358
## theta (batch 1): 0.00629119
## betas:    1.3798  -0.2129  -0.3238  -0.0024   0.3647   0.8411   1.4109   0.5300   1.5482   0.8457  -(
##
## sigma: 0.17913
## lambda (gene 1): 1.6798
## epsilon (gene 1): 0.114505
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 21440 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 116.502
## delta (gene 1): 19.38
## s (cell 1): 1.09529
## nu (cell 1): 1.07893
## theta (batch 1): 0.0174179
```

```
## betas:    1.0035  -0.1952   0.1442   0.2276   0.4456   1.6205   0.8910   0.9729   1.7232   0.4543  -0
##
## sigma: 0.195148
## lambda (gene 1): 1.47377
## epsilon (gene 1): 0.264877
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 21480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.489
## delta (gene 1): 10.8257
## s (cell 1): 1.12313
## nu (cell 1): 1.10914
## theta (batch 1): 0.00697885
## betas:    1.5904  -0.1808   0.1148   0.2633   0.4027   0.8760   1.0198   0.7535   1.2002   0.7195  -0
##
## sigma: 0.1816
## lambda (gene 1): 0.420563
## epsilon (gene 1): -0.31858
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 21520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 270.381
## delta (gene 1): 12.027
## s (cell 1): 0.792533
## nu (cell 1): 1.04253
## theta (batch 1): 0.0214309
## betas:    1.3723  -0.2599  -0.0005  -0.3597   0.3726   1.4390   0.6564   1.1537   1.4132   0.8139  -0
##
## sigma: 0.192897
## lambda (gene 1): 0.749207
## epsilon (gene 1): -0.23649
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 21560 out of 40000 has been completed.
## --------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.013
## delta (gene 1): 12.6624
## s (cell 1): 1.19481
## nu (cell 1): 1.08892
## theta (batch 1): 0.0189642
## betas:    1.0869  -0.1095  -0.0516   0.3382   0.6431   1.2131   1.0296   0.8453   1.2577   0.8350  -(
##
## sigma: 0.183719
## lambda (gene 1): 2.28426
## epsilon (gene 1): -0.197805
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 21600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.723
## delta (gene 1): 15.4964
## s (cell 1): 1.3957
## nu (cell 1): 1.07856
## theta (batch 1): 0.135063
## betas:    0.8364  -0.3018   0.0282   0.1356   0.8331   1.1475   1.2445   1.1210   1.9158   0.7411  (
##
## sigma: 0.183177
## lambda (gene 1): 2.20899
## epsilon (gene 1): 0.036682
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 21640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.178
## delta (gene 1): 14.2168
## s (cell 1): 0.915507
## nu (cell 1): 1.0547
## theta (batch 1): 0.0281984
## betas:    1.1666  -0.2177  -0.4425   0.1637   1.1026   0.3960   1.7383   0.5787   1.5928   0.9203  -(
##
## sigma: 0.184206
## lambda (gene 1): 1.13921
## epsilon (gene 1): -0.0706457
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 21680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 302.034
## delta (gene 1): 16.7354
## s (cell 1): 1.25362
## nu (cell 1): 1.07783
## theta (batch 1): 0.0330471
## betas:    1.7724  -0.2370  -0.6267  -0.4043   0.8391   0.8850   0.8268   0.9130   1.1866   0.7078  -(
##
## sigma: 0.188847
## lambda (gene 1): 0.223999
## epsilon (gene 1): 0.100088
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 21720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.817
## delta (gene 1): 12.5513
## s (cell 1): 1.11703
## nu (cell 1): 1.15508
## theta (batch 1): 0.051061
## betas:    1.0723  -0.1178  -0.0460  -0.0941   0.5554   1.4718   0.8837   0.9757   1.2357   0.8126  -(
##
## sigma: 0.177966
## lambda (gene 1): 2.18819
## epsilon (gene 1): -0.197316
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 21760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.537
## delta (gene 1): 15.7771
## s (cell 1): 1.35089
## nu (cell 1): 1.06989
## theta (batch 1): 0.020046
## betas:    0.6491  -0.0738  -0.8277  -0.1654   1.3307   1.5530   0.5395   1.6036   0.9387   0.9499  -(
##
```

```
## sigma: 0.185228
## lambda (gene 1): 1.28882
## epsilon (gene 1): 0.0594906
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 21800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.598
## delta (gene 1): 19.0953
## s (cell 1): 1.02913
## nu (cell 1): 1.12269
## theta (batch 1): 0.0022822
## betas:    1.2019  -0.1401  -0.3206  -0.1261   0.9997   1.0914   1.0586   0.6967   1.6394   0.1774  -(
##
## sigma: 0.203467
## lambda (gene 1): 0.935963
## epsilon (gene 1): 0.249378
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 21840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 290.167
## delta (gene 1): 12.3535
## s (cell 1): 1.2137
## nu (cell 1): 1.18353
## theta (batch 1): 0.00176532
## betas:    1.1861  -0.1771  -0.0275   0.2192   0.2904   1.1782   1.3033   0.5127   1.7151   0.6764  -(
##
## sigma: 0.200198
## lambda (gene 1): 0.913704
## epsilon (gene 1): -0.213417
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 21880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 125.976
```

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## delta (gene 1): 13.3637
## s (cell 1): 1.2059
## nu (cell 1): 1.08076
## theta (batch 1): 0.00866329
## betas:    1.1231  -0.1470  -0.5359   0.5636   0.4729   1.2172   1.0162   0.9479   1.2912   0.7234  -(
##
## sigma: 0.176845
## lambda (gene 1): 0.918724
## epsilon (gene 1): -0.137042
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 21920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.383
## delta (gene 1): 17.7207
## s (cell 1): 1.14396
## nu (cell 1): 1.14406
## theta (batch 1): 0.00861313
## betas:    1.6028  -0.0471  -0.3221  -0.0473   0.5188   1.1725   0.6219   0.7317   1.0993   0.1791  -
##
## sigma: 0.184504
## lambda (gene 1): 1.56934
## epsilon (gene 1): 0.157869
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 21960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.813
## delta (gene 1): 14.2205
## s (cell 1): 1.1839
## nu (cell 1): 1.11548
## theta (batch 1): 0.0152352
## betas:    1.1824  -0.2172  -0.1304   0.1045   0.5749   1.0895   1.1383   0.9291   1.4892   0.7554  -(
##
## sigma: 0.187466
## lambda (gene 1): 0.803675
## epsilon (gene 1): -0.0747726
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

```
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 22000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.747
## delta (gene 1): 15.4598
## s (cell 1): 1.02389
## nu (cell 1): 1.03482
## theta (batch 1): 0.0336551
## betas:    0.6674  -0.1991  -0.9044   0.1707   0.3948   2.0849   0.6036   1.3409   1.7735   0.4925   (
##
## sigma: 0.190411
## lambda (gene 1): 0.722145
## epsilon (gene 1): 0.0273047
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 22040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 165.864
## delta (gene 1): 13.084
## s (cell 1): 1.12586
## nu (cell 1): 1.09988
## theta (batch 1): 0.0594749
## betas:    1.4099  -0.1699  -0.0798  -0.3841   0.7506   1.1570   0.8476   0.9272   1.2337   0.6650  -(
##
## sigma: 0.178128
## lambda (gene 1): 0.60196
## epsilon (gene 1): -0.146331
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 22080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.414
## delta (gene 1): 11.8893
## s (cell 1): 1.169
## nu (cell 1): 1.10351
## theta (batch 1): 0.0279075
## betas:    0.8569  -0.1098   0.0333   0.5612   0.3369   1.5889   0.8919   1.1294   1.2694   0.7578  -(
##
## sigma: 0.188424
## lambda (gene 1): 0.41738
```

```
## epsilon (gene 1): -0.227837
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 22120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.232
## delta (gene 1): 15.9661
## s (cell 1): 0.977596
## nu (cell 1): 1.02464
## theta (batch 1): 0.0121494
## betas:    0.8759  -0.1284   0.3074   0.2350   0.8290   1.1990   1.1657   0.9986   1.2390   1.0083  -0
##
## sigma: 0.176958
## lambda (gene 1): 0.765666
## epsilon (gene 1): 0.0513308
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 22160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 259.169
## delta (gene 1): 14.237
## s (cell 1): 1.18916
## nu (cell 1): 1.1015
## theta (batch 1): 0.0103768
## betas:    0.8074  -0.0447   0.0057   0.5041   0.7972   1.3104   0.9438   1.0480   1.1495   0.6827  -0
##
## sigma: 0.183055
## lambda (gene 1): 0.672322
## epsilon (gene 1): -0.0753023
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 22200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.36
## delta (gene 1): 17.3254
## s (cell 1): 1.12983
```

```
## nu (cell 1): 1.1956
## theta (batch 1): 0.0150385
## betas:    1.3167  -0.1325  -0.3009  -0.0957   0.4725   1.4549   0.5321   1.3678   0.6498   1.1747  -0
##
## sigma: 0.176224
## lambda (gene 1): 1.49842
## epsilon (gene 1): 0.129138
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 22240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.328
## delta (gene 1): 14.6219
## s (cell 1): 1.1438
## nu (cell 1): 1.15091
## theta (batch 1): 0.00965222
## betas:    0.8172  -0.0873  -0.5753   0.6495   0.7848   1.1988   1.0552   1.0568   1.2871   0.5593  -0
##
## sigma: 0.186266
## lambda (gene 1): 1.1136
## epsilon (gene 1): -0.0353834
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 22280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.077
## delta (gene 1): 14.7503
## s (cell 1): 1.15516
## nu (cell 1): 1.16831
## theta (batch 1): 0.00715182
## betas:    1.0069  -0.2034  -1.0716  -0.0820   1.1769   1.2233   0.9401   1.1895   1.3696   0.7622   0
##
## sigma: 0.180751
## lambda (gene 1): 0.341839
## epsilon (gene 1): -0.0109884
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
```

```
## Iteration 22320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.956
## delta (gene 1): 14.8271
## s (cell 1): 1.12364
## nu (cell 1): 1.03271
## theta (batch 1): 0.0129298
## betas:    1.4487  -0.1693  -0.5917   0.0190   0.5502   1.0994   1.0024   0.6842   1.4502   0.5664  -(
##
## sigma: 0.189261
## lambda (gene 1): 2.02662
## epsilon (gene 1): -0.00487879
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 22360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.563
## delta (gene 1): 13.0999
## s (cell 1): 1.29727
## nu (cell 1): 1.06199
## theta (batch 1): 0.0156558
## betas:    1.0820  -0.1974   0.1161  -0.0073   0.9819   0.8193   1.3224   0.8928   1.4407   0.8040  -(
##
## sigma: 0.189442
## lambda (gene 1): 0.863194
## epsilon (gene 1): -0.128213
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 22400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.256
## delta (gene 1): 16.5564
## s (cell 1): 1.20017
## nu (cell 1): 1.03244
## theta (batch 1): 0.0339178
## betas:    1.3905  -0.2585  -0.0180  -0.4368   0.4641   1.1047   0.9924   0.8781   1.5970   0.6560  -(
##
## sigma: 0.190386
## lambda (gene 1): 0.87968
## epsilon (gene 1): 0.0845349
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 22440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.323
## delta (gene 1): 12.9053
## s (cell 1): 1.1612
## nu (cell 1): 1.09742
## theta (batch 1): 0.0181202
## betas:   1.6969  -0.2088   0.1083  -0.1464   0.2110   1.1712   0.9146   0.5743   1.5173   0.6292  -
##
## sigma: 0.182085
## lambda (gene 1): 0.266264
## epsilon (gene 1): -0.181148
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 22480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.597
## delta (gene 1): 17.553
## s (cell 1): 0.997694
## nu (cell 1): 1.07897
## theta (batch 1): 0.00526427
## betas:   1.1700  -0.1869   0.4689  -0.4338   0.7784   1.3895   0.5563   1.4360   0.9427   1.1763  -(
##
## sigma: 0.190229
## lambda (gene 1): 0.910899
## epsilon (gene 1): 0.145695
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 22520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.221
## delta (gene 1): 12.8261
## s (cell 1): 1.02475
## nu (cell 1): 1.1119
## theta (batch 1): 0.00478795
```

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## betas:     1.2734  -0.1525   0.4865   0.0020   0.0131   1.8121   0.6741   0.9500   1.1874   0.8600  -0
##
## sigma: 0.18504
## lambda (gene 1): 0.767439
## epsilon (gene 1): -0.194358
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 22560 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 146.997
## delta (gene 1): 11.6856
## s (cell 1): 1.107
## nu (cell 1): 1.10596
## theta (batch 1): 0.00619568
## betas:     1.7941  -0.2458  -0.0321  -0.3063   0.4687   0.9280   0.7916   1.0783   0.8151   1.2724  -0
##
## sigma: 0.19484
## lambda (gene 1): 0.962875
## epsilon (gene 1): -0.268913
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 22600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.297
## delta (gene 1): 16.0632
## s (cell 1): 1.05467
## nu (cell 1): 1.11468
## theta (batch 1): 0.00486737
## betas:     1.5044  -0.1845  -0.2280  -0.5741   0.6038   0.8902   0.8902   1.0603   0.9614   0.9658  -0
##
## sigma: 0.182219
## lambda (gene 1): 1.51298
## epsilon (gene 1): 0.0605277
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 22640 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.798
## delta (gene 1): 12.4837
## s (cell 1): 1.00625
## nu (cell 1): 1.04236
## theta (batch 1): 0.00377594
## betas:    0.4322   0.0557  -0.0170   0.7496   1.0865   1.4104   1.2400   0.6585   1.5500   0.2871  -(
##
## sigma: 0.18085
## lambda (gene 1): 1.8458
## epsilon (gene 1): -0.200466
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 22680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 311.106
## delta (gene 1): 14.2707
## s (cell 1): 1.20719
## nu (cell 1): 1.06449
## theta (batch 1): 0.00647048
## betas:    0.8254  -0.1168  -0.8798   0.3773   0.9128   1.0712   1.1422   1.1185   1.1334   1.0220  -(
##
## sigma: 0.183526
## lambda (gene 1): 0.280918
## epsilon (gene 1): -0.0771041
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 22720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.223
## delta (gene 1): 17.8674
## s (cell 1): 1.04519
## nu (cell 1): 1.02022
## theta (batch 1): 0.00103515
## betas:    0.8543   0.0031  -0.5416  -0.0149   0.7816   1.7628   0.6043   1.0303   1.1809   0.3772  -(
##
## sigma: 0.189127
## lambda (gene 1): 0.409196
## epsilon (gene 1): 0.186811
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 22760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 112.849
## delta (gene 1): 14.286
## s (cell 1): 1.05484
## nu (cell 1): 1.15141
## theta (batch 1): 0.00170593
## betas:    1.1335  -0.1020  -0.5744  -0.3422   0.8089   1.8047   0.3345   1.4304   0.7692   1.0254  -(
##
## sigma: 0.181663
## lambda (gene 1): 0.442266
## epsilon (gene 1): -0.0681437
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 22800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 136.44
## delta (gene 1): 13.0611
## s (cell 1): 1.16619
## nu (cell 1): 1.11353
## theta (batch 1): 0.000791968
## betas:    0.6437  -0.0617   0.0812  -0.0984   0.6280   1.6003   0.9124   1.2055   1.1943   0.6713  -(
##
## sigma: 0.186709
## lambda (gene 1): 0.466335
## epsilon (gene 1): -0.127484
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 22840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 377.229
## delta (gene 1): 14.1622
## s (cell 1): 1.16119
## nu (cell 1): 1.09342
## theta (batch 1): 0.0011093
## betas:    1.3162  -0.1720  -0.4959  -0.8979   0.5910   1.4863   0.8265   0.8055   1.5569   0.3487  -(
##
```

```
## sigma: 0.183101
## lambda (gene 1): 0.626637
## epsilon (gene 1): -0.0610327
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 22880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.107
## delta (gene 1): 11.6274
## s (cell 1): 0.994586
## nu (cell 1): 1.01058
## theta (batch 1): 0.000560045
## betas:    0.7709  -0.2012  -0.2305  -0.1685   0.5301   1.6368   1.0091   1.1272   1.5341   1.1112  -(
##
## sigma: 0.188543
## lambda (gene 1): 2.26
## epsilon (gene 1): -0.279981
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 22920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.391
## delta (gene 1): 13.1501
## s (cell 1): 0.979109
## nu (cell 1): 0.993909
## theta (batch 1): 0.000704268
## betas:    0.9461  -0.1706  -0.7442   0.2490   0.6190   1.3692   0.9461   1.0982   1.4632   0.6453  -(
##
## sigma: 0.185714
## lambda (gene 1): 0.475522
## epsilon (gene 1): -0.115656
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 22960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 147.348
```

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## delta (gene 1): 16.6475
## s (cell 1): 1.10815
## nu (cell 1): 1.07622
## theta (batch 1): 0.00158669
## betas:    1.2406  -0.1413  -0.7431  -0.1674   0.5710   1.4336   0.5749   1.2366   1.0648   0.7481  -(
##
## sigma: 0.177276
## lambda (gene 1): 1.41601
## epsilon (gene 1): 0.0886947
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 23000 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 213.854
## delta (gene 1): 15.2473
## s (cell 1): 1.05547
## nu (cell 1): 1.06463
## theta (batch 1): 0.00107289
## betas:    1.0245  -0.0719  -0.7955  -0.2741   0.9435   1.3572   0.7203   1.2095   0.9163   0.8044  -(
##
## sigma: 0.190198
## lambda (gene 1): 1.33201
## epsilon (gene 1): 0.00519968
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 23040 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 274.248
## delta (gene 1): 12.8395
## s (cell 1): 1.04677
## nu (cell 1): 1.08748
## theta (batch 1): 0.00106911
## betas:    1.6166  -0.1540  -0.5120  -0.5893   0.8331   0.8888   1.0011   0.5807   1.4164   0.3230  -(
##
## sigma: 0.179155
## lambda (gene 1): 0.577428
## epsilon (gene 1): -0.169811
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

```
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 23080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.537
## delta (gene 1): 15.6361
## s (cell 1): 1.0566
## nu (cell 1): 1.08578
## theta (batch 1): 0.00189283
## betas:    0.9520  -0.1427  -0.8344  -0.0745   0.9075   1.0216   1.2194   0.9521   1.3508   0.7814  -(
##
## sigma: 0.184344
## lambda (gene 1): 1.20263
## epsilon (gene 1): 0.0526432
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 23120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.529
## delta (gene 1): 16.344
## s (cell 1): 1.07659
## nu (cell 1): 1.05309
## theta (batch 1): 0.00102977
## betas:    1.0384  -0.0711  -0.8527   0.0394   0.7196   1.2944   1.0315   0.8638   1.2166   0.5160  -(
##
## sigma: 0.1838
## lambda (gene 1): 0.393088
## epsilon (gene 1): 0.0916008
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 23160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 155.537
## delta (gene 1): 14.2896
## s (cell 1): 1.00943
## nu (cell 1): 1.09274
## theta (batch 1): 0.00150446
## betas:    1.3888  -0.1484  -0.8429  -0.6730   1.3956   0.7850   0.7347   1.2987   0.7407   0.9889  -(
##
## sigma: 0.188611
## lambda (gene 1): 0.739637
```

```
## epsilon (gene 1): -0.0476838
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 23200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 213.884
## delta (gene 1): 18.985
## s (cell 1): 1.03504
## nu (cell 1): 1.06345
## theta (batch 1): 0.000410081
## betas:    1.2056   -0.2408   -0.9533    0.1895    0.4545    1.4642    0.5091    1.6021    1.0009    1.0308   -(
##
## sigma: 0.179522
## lambda (gene 1): 0.817349
## epsilon (gene 1): 0.247559
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 23240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 157.459
## delta (gene 1): 18.1152
## s (cell 1): 1.15419
## nu (cell 1): 1.11122
## theta (batch 1): 0.000985028
## betas:    1.0159   -0.1292   -0.2939    0.2213    0.6717    1.5376    0.7622    1.0538    1.3297    0.6655   -(
##
## sigma: 0.183617
## lambda (gene 1): 0.996044
## epsilon (gene 1): 0.17891
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 23280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.729
## delta (gene 1): 14.4776
## s (cell 1): 1.1224
```

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## nu (cell 1): 1.04807
## theta (batch 1): 0.00199722
## betas:    1.3144  -0.1195  -0.7939   0.3350   0.6199   0.8119   1.2591   0.6304   1.3657   0.4202  -(
##
## sigma: 0.18561
## lambda (gene 1): 0.53413
## epsilon (gene 1): -0.0443187
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.617
## delta (gene 1): 16.3641
## s (cell 1): 1.07834
## nu (cell 1): 1.14844
## theta (batch 1): 0.00326025
## betas:    1.2615  -0.1182  -0.7299   0.0474   0.8855   0.7288   1.2388   0.6288   1.4178   0.4887  -(
##
## sigma: 0.19529
## lambda (gene 1): 0.530179
## epsilon (gene 1): 0.0716787
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.419
## delta (gene 1): 16.3476
## s (cell 1): 1.14808
## nu (cell 1): 1.13058
## theta (batch 1): 0.0121983
## betas:    1.3755  -0.1221  -0.5313  -0.3225   0.9036   0.9045   1.2207   0.4839   1.5437   0.2997  -(
##
## sigma: 0.171481
## lambda (gene 1): 0.520322
## epsilon (gene 1): 0.0752271
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
```

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## Iteration 23400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 134.366
## delta (gene 1): 13.9478
## s (cell 1): 1.39381
## nu (cell 1): 1.14189
## theta (batch 1): 0.0158696
## betas:    1.3709  -0.0802  -0.7039   0.4694   0.4964   1.0571   1.0735   0.6104   1.2438   0.4635  -(
##
## sigma: 0.18761
## lambda (gene 1): 1.04166
## epsilon (gene 1): -0.0838605
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 325.159
## delta (gene 1): 12.8102
## s (cell 1): 1.16934
## nu (cell 1): 1.15176
## theta (batch 1): 0.0119834
## betas:    1.3573  -0.1410   0.0789   0.1921   0.5231   1.3975   0.5970   0.9588   1.4036   0.2278  -(
##
## sigma: 0.184551
## lambda (gene 1): 1.37198
## epsilon (gene 1): -0.139132
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 146.773
## delta (gene 1): 14.2046
## s (cell 1): 0.920101
## nu (cell 1): 1.00797
## theta (batch 1): 0.00877927
## betas:    1.2955  -0.0681   0.0896  -1.2209   1.7488   1.1200   0.5431   1.0041   1.2091   0.1986  -(
##
## sigma: 0.18148
## lambda (gene 1): 1.05082
## epsilon (gene 1): -0.0743267
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.357
## delta (gene 1): 12.9113
## s (cell 1): 1.10806
## nu (cell 1): 1.09214
## theta (batch 1): 0.00586775
## betas:    0.8204   0.0721   0.6394   0.7976   0.4630   1.6758   0.6744   0.9784   1.0594   0.1516  -
##
## sigma: 0.17694
## lambda (gene 1): 1.39213
## epsilon (gene 1): -0.134698
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.31
## delta (gene 1): 16.1777
## s (cell 1): 0.994918
## nu (cell 1): 1.1629
## theta (batch 1): 0.00443386
## betas:    1.4934  -0.1774  -0.3573  -0.4439   0.5984   1.1848   0.5741   1.2226   0.9161   0.9171  -
##
## sigma: 0.1966
## lambda (gene 1): 0.52706
## epsilon (gene 1): 0.0896176
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.77
## delta (gene 1): 16.2423
## s (cell 1): 1.17651
## nu (cell 1): 1.1902
## theta (batch 1): 0.0011773
```

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## betas:     1.1288  -0.1616  -0.5210  -0.3355   1.2658   1.0351   1.0589   0.9570   1.3116   0.7244  -(
##
## sigma: 0.187578
## lambda (gene 1): 1.01688
## epsilon (gene 1): 0.0756715
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 23640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 350.571
## delta (gene 1): 18.0099
## s (cell 1): 1.00622
## nu (cell 1): 0.976226
## theta (batch 1): 0.0013843
## betas:     1.4913  -0.2820   0.0924  -0.7379   0.4006   1.0008   1.4238   0.4338   1.8680   0.6307  -(
##
## sigma: 0.178649
## lambda (gene 1): 0.613996
## epsilon (gene 1): 0.180137
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 23680 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.374
## delta (gene 1): 12.4019
## s (cell 1): 1.13739
## nu (cell 1): 1.15473
## theta (batch 1): 0.00105119
## betas:     1.3457  -0.0267  -0.3540   0.9762   0.8887   0.8701   0.6366   1.2612   0.4705   0.8706  -:
##
## sigma: 0.188751
## lambda (gene 1): 1.17406
## epsilon (gene 1): -0.180733
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 23720 out of 40000 has been completed.
## ------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.372
## delta (gene 1): 12.203
## s (cell 1): 1.1309
## nu (cell 1): 1.1041
## theta (batch 1): 0.00912314
## betas:    1.3817  -0.1348   0.1105   0.1068   0.6547   0.8800   1.1929   0.5682   1.4624   0.3391  -(
##
## sigma: 0.191214
## lambda (gene 1): 0.543041
## epsilon (gene 1): -0.206131
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.404
## delta (gene 1): 15.605
## s (cell 1): 1.22162
## nu (cell 1): 1.06782
## theta (batch 1): 0.00683712
## betas:    1.4901  -0.1645  -0.7899   0.3614   0.2028   1.2550   0.8248   0.8349   1.2581   0.6537  -(
##
## sigma: 0.190391
## lambda (gene 1): 1.76048
## epsilon (gene 1): 0.0317939
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 23800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.967
## delta (gene 1): 13.9769
## s (cell 1): 1.01759
## nu (cell 1): 1.00281
## theta (batch 1): 0.00660032
## betas:    0.9829  -0.0754  -1.0762   0.1812   0.8423   1.0937   1.1949   0.6762   1.4976   0.4268  -(
##
## sigma: 0.175887
## lambda (gene 1): 0.896962
## epsilon (gene 1): -0.0759278
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 23840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.461
## delta (gene 1): 11.2064
## s (cell 1): 1.02404
## nu (cell 1): 1.13951
## theta (batch 1): 0.00536269
## betas:    0.7630  -0.0621  -0.4836  -0.0675   0.8648   1.6576   0.6736   1.1761   1.3687   0.3832  -(
##
## sigma: 0.181888
## lambda (gene 1): 2.4098
## epsilon (gene 1): -0.296055
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 23880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.348
## delta (gene 1): 14.8596
## s (cell 1): 1.20823
## nu (cell 1): 1.06145
## theta (batch 1): 0.0134337
## betas:    1.6502  -0.2295  -0.8819  -0.5065   0.8388   1.1267   0.3837   1.3764   0.9926   0.7089  -(
##
## sigma: 0.191852
## lambda (gene 1): 1.72657
## epsilon (gene 1): -0.0166204
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 23920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 232.606
## delta (gene 1): 15.0334
## s (cell 1): 1.06452
## nu (cell 1): 1.07809
## theta (batch 1): 0.00766726
## betas:    1.5338  -0.0783   0.2667  -0.1599   0.5143   1.2139   0.5942   0.8254   1.1621   0.2362  -(
##
```

```
## sigma: 0.193627
## lambda (gene 1): 0.723802
## epsilon (gene 1): 0.0113069
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 23960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.916
## delta (gene 1): 13.4037
## s (cell 1): 1.20728
## nu (cell 1): 1.15542
## theta (batch 1): 0.00332202
## betas:    1.3358   -0.0195    0.2409   -0.1386    0.7353    1.1444    0.7436    0.7980    1.1146    0.1006   -0
##
## sigma: 0.175203
## lambda (gene 1): 0.875886
## epsilon (gene 1): -0.102941
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 24000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 282.043
## delta (gene 1): 12.7461
## s (cell 1): 1.04553
## nu (cell 1): 1.01305
## theta (batch 1): 0.00384891
## betas:    0.4018   -0.0478    0.2973   -0.1326    0.9518    1.6086    1.2287    0.8588    1.6676    0.5425   -0
##
## sigma: 0.189365
## lambda (gene 1): 0.680277
## epsilon (gene 1): -0.184449
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 24040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 340.004
```

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## delta (gene 1): 17.0014
## s (cell 1): 0.950205
## nu (cell 1): 0.98115
## theta (batch 1): 0.00116051
## betas:    0.5635  -0.0282  -0.4476   0.5854   1.1403   1.2451   1.0268   1.2601   0.9960   0.8506  -(
##
## sigma: 0.196764
## lambda (gene 1): 1.88512
## epsilon (gene 1): 0.104846
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 322.584
## delta (gene 1): 16.263
## s (cell 1): 1.01909
## nu (cell 1): 1.10598
## theta (batch 1): 0.0054663
## betas:    1.0327  -0.1006   0.2630  -0.3442   0.9558   1.2647   0.7603   1.2953   0.8610   1.0408  -(
##
## sigma: 0.191655
## lambda (gene 1): 0.354675
## epsilon (gene 1): 0.0779292
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 161.964
## delta (gene 1): 13.3647
## s (cell 1): 1.19876
## nu (cell 1): 1.12755
## theta (batch 1): 0.026899
## betas:    1.3793  -0.1652   0.6498   0.0120   0.8802   0.6860   1.5080   0.2628   1.6521   0.7043  -:
##
## sigma: 0.197882
## lambda (gene 1): 1.03533
## epsilon (gene 1): -0.141224
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.127
## delta (gene 1): 16.0136
## s (cell 1): 1.14237
## nu (cell 1): 1.18971
## theta (batch 1): 0.00865961
## betas:    1.3078   -0.1631    0.3726   -0.0725    0.4273    1.4315    0.5693    1.1985    1.2824    0.2663
##
## sigma: 0.195834
## lambda (gene 1): 1.29462
## epsilon (gene 1): 0.0768364
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.689
## delta (gene 1): 12.6914
## s (cell 1): 1.2672
## nu (cell 1): 1.0771
## theta (batch 1): 0.0202459
## betas:    1.1456   -0.1733   -0.5078    0.0159    0.9594    1.1002    0.8689    1.2101    1.1839    0.7372   -(
##
## sigma: 0.179433
## lambda (gene 1): 0.800368
## epsilon (gene 1): -0.179651
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.743
## delta (gene 1): 12.7002
## s (cell 1): 1.25707
## nu (cell 1): 1.03079
## theta (batch 1): 0.0178892
## betas:    1.1677   -0.1186   -0.2693   -0.0092    0.6962    1.1546    1.0182    0.7874    1.4350    0.4405   -(
##
## sigma: 0.190192
## lambda (gene 1): 0.33626
```

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## epsilon (gene 1): -0.178341
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 24280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 300.255
## delta (gene 1): 14.6147
## s (cell 1): 1.15773
## nu (cell 1): 0.992909
## theta (batch 1): 0.0233251
## betas:    0.7224  -0.1272  -0.3063   0.2138   1.6654   0.5598   1.4182   1.1788   1.0520   1.2669  -(
##
## sigma: 0.187375
## lambda (gene 1): 0.494887
## epsilon (gene 1): -0.0283955
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 24320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.074
## delta (gene 1): 13.7777
## s (cell 1): 1.14093
## nu (cell 1): 1.08212
## theta (batch 1): 0.0167003
## betas:    1.1890  -0.1079  -0.5899   0.5636   0.8539   1.0782   0.7772   1.0697   1.1120   0.6664  -(
##
## sigma: 0.184863
## lambda (gene 1): 0.542744
## epsilon (gene 1): -0.0856633
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 24360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.832
## delta (gene 1): 13.2357
## s (cell 1): 1.03226
```

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## nu (cell 1): 1.04112
## theta (batch 1): 0.0159108
## betas:    1.4873  -0.0923  -0.4380   0.2996   0.6111   1.0291   0.6953   0.9333   1.1175   0.2170  -(
##
## sigma: 0.195382
## lambda (gene 1): 0.709709
## epsilon (gene 1): -0.127647
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 24400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.429
## delta (gene 1): 15.0837
## s (cell 1): 0.99567
## nu (cell 1): 1.03423
## theta (batch 1): 0.00578286
## betas:    1.1246  -0.1397  -0.3430   0.0741   1.1110   0.4716   1.4618   0.8354   1.1309   0.9995  -(
##
## sigma: 0.191079
## lambda (gene 1): 1.31383
## epsilon (gene 1): -0.00170133
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 24440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 219.595
## delta (gene 1): 13.6413
## s (cell 1): 0.96162
## nu (cell 1): 1.06036
## theta (batch 1): 0.00175157
## betas:    0.9026  -0.1016  -0.6578  -0.1570   1.2994   1.1889   0.7917   1.4054   0.9173   0.8717  -(
##
## sigma: 0.189203
## lambda (gene 1): 0.94834
## epsilon (gene 1): -0.0795229
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
```

```
## Iteration 24480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.83
## delta (gene 1): 19.767
## s (cell 1): 1.0538
## nu (cell 1): 1.09068
## theta (batch 1): 0.00167813
## betas:    1.5614  -0.2207  -0.5124   0.0178   0.2777   1.0509   1.0237   0.7295   1.4830   0.5641  -(
##
## sigma: 0.184533
## lambda (gene 1): 0.968966
## epsilon (gene 1): 0.271169
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.959
## delta (gene 1): 19.832
## s (cell 1): 1.18169
## nu (cell 1): 1.13298
## theta (batch 1): 0.00177373
## betas:    0.8756  -0.1424  -0.5354   0.1045   1.3307   0.8431   1.3600   0.9236   1.3805   0.8104  -(
##
## sigma: 0.187089
## lambda (gene 1): 0.645255
## epsilon (gene 1): 0.300839
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.594
## delta (gene 1): 14.8445
## s (cell 1): 0.990871
## nu (cell 1): 1.00868
## theta (batch 1): 0.00336027
## betas:    1.1259  -0.0230  -0.0077   0.4926   0.8377   1.0030   0.8020   1.2833   0.4318   1.1532  -:
##
## sigma: 0.188711
## lambda (gene 1): 0.68265
## epsilon (gene 1): -0.0185305
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------
## Iteration 24600 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.633
## delta (gene 1): 18.9805
## s (cell 1): 1.07629
## nu (cell 1): 1.07053
## theta (batch 1): 0.000568578
## betas:    1.4496  -0.0785  -0.1716  -0.4210   1.0857   0.7794   0.8377   1.0015   0.7724   0.6631   -(
##
## sigma: 0.185848
## lambda (gene 1): 2.22727
## epsilon (gene 1): 0.222442
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------
## Iteration 24640 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.642
## delta (gene 1): 16.4559
## s (cell 1): 1.0296
## nu (cell 1): 1.01736
## theta (batch 1): 0.00100706
## betas:    1.2809  -0.1507   0.0752  -0.6853   0.8923   1.2830   0.5546   1.4373   0.6774   1.3513   -:
##
## sigma: 0.191123
## lambda (gene 1): 1.6286
## epsilon (gene 1): 0.0746524
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------
## Iteration 24680 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.583
## delta (gene 1): 13.6362
## s (cell 1): 0.955632
## nu (cell 1): 0.982056
## theta (batch 1): 0.00128026
```

```
## betas:      1.3701  -0.1389    0.2782  -1.0118    0.6538    1.3354    0.6918    0.9830    1.1795    0.6743  -(
##
## sigma: 0.190367
## lambda (gene 1): 0.402812
## epsilon (gene 1): -0.0928116
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 24720 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 121.367
## delta (gene 1): 11.6804
## s (cell 1): 1.19265
## nu (cell 1): 1.13001
## theta (batch 1): 0.00229845
## betas:      0.3360  -0.0324  -0.3480  -0.0573    1.1968    1.5979    1.2554    0.9285    1.5015    0.7067  -(
##
## sigma: 0.182854
## lambda (gene 1): 1.23419
## epsilon (gene 1): -0.262223
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 24760 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.492
## delta (gene 1): 13.015
## s (cell 1): 0.96584
## nu (cell 1): 0.969201
## theta (batch 1): 0.00138741
## betas:      0.9226  -0.1064  -0.4143    0.4765    0.1891    1.6555    0.9112    0.9225    1.4420    0.5737  -(
##
## sigma: 0.196621
## lambda (gene 1): 0.740123
## epsilon (gene 1): -0.15472
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 24800 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.653
## delta (gene 1): 13.1771
## s (cell 1): 1.03526
## nu (cell 1): 1.04519
## theta (batch 1): 0.0013677
## betas:    1.3737  -0.1144   0.0631  -0.8460   0.8075   1.2220   0.7853   0.8911   1.0974   0.7887  -
##
## sigma: 0.173061
## lambda (gene 1): 3.21244
## epsilon (gene 1): -0.136583
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.991
## delta (gene 1): 13.8883
## s (cell 1): 1.05075
## nu (cell 1): 1.02899
## theta (batch 1): 0.00240968
## betas:    1.5786  -0.0725  -0.1863   0.0147   0.1632   1.4035   0.6513   0.7091   1.1227   0.2688  -
##
## sigma: 0.18459
## lambda (gene 1): 1.2848
## epsilon (gene 1): -0.0866314
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 24880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.953
## delta (gene 1): 9.46583
## s (cell 1): 1.14596
## nu (cell 1): 1.0961
## theta (batch 1): 0.00178358
## betas:    1.4279  -0.0643   0.0241   0.4014   0.3904   1.3073   0.7742   0.6415   1.2915   0.2925  -
##
## sigma: 0.196247
## lambda (gene 1): 0.404652
## epsilon (gene 1): -0.472784
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

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## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 24920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 122.815
## delta (gene 1): 14.2657
## s (cell 1): 1.11603
## nu (cell 1): 1.1035
## theta (batch 1): 0.0102348
## betas:    1.6183  -0.1743  -0.8823  -0.3272   0.6235   0.9426   1.0691   0.5133   1.4605   0.5353  -(
##
## sigma: 0.180017
## lambda (gene 1): 1.70269
## epsilon (gene 1): -0.0732064
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 24960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 313.758
## delta (gene 1): 12.5558
## s (cell 1): 1.09621
## nu (cell 1): 1.02865
## theta (batch 1): 0.00442371
## betas:    1.1611  -0.1094  -0.3398  -0.3504   0.6532   1.2384   0.8997   1.0345   1.0500   0.8749  -:
##
## sigma: 0.191168
## lambda (gene 1): 0.670474
## epsilon (gene 1): -0.17417
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 25000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.593
## delta (gene 1): 17.2459
## s (cell 1): 1.05455
## nu (cell 1): 1.12725
## theta (batch 1): 0.0101954
## betas:    0.9040  -0.0828   0.3554  -0.3049   0.9720   1.3296   0.8475   1.1052   1.2579   0.4651  -(
##
```

```
## sigma: 0.184303
## lambda (gene 1): 0.474484
## epsilon (gene 1): 0.135389
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.711
## delta (gene 1): 12.842
## s (cell 1): 1.19375
## nu (cell 1): 1.04184
## theta (batch 1): 0.00543034
## betas:    0.8873  -0.1955  -0.5341  -0.0967   0.8513   1.4262   0.8554   1.3296   1.2593   1.0511  -(
##
## sigma: 0.181988
## lambda (gene 1): 0.755619
## epsilon (gene 1): -0.146779
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.493
## delta (gene 1): 12.0391
## s (cell 1): 0.96106
## nu (cell 1): 1.17893
## theta (batch 1): 0.0181067
## betas:    1.4781  -0.1354  -0.8865   0.5238   0.1121   1.1711   1.2328   0.2190   1.6809   0.3586  -(
##
## sigma: 0.179102
## lambda (gene 1): 0.948591
## epsilon (gene 1): -0.235395
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.26
```

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## delta (gene 1): 13.5175
## s (cell 1): 1.25014
## nu (cell 1): 1.06775
## theta (batch 1): 0.0262329
## betas:    0.9838  -0.1874  -0.3276  -0.1257   0.7903   1.3767   0.9144   1.1769   1.3873   0.7514  -0
##
## sigma: 0.189752
## lambda (gene 1): 1.83887
## epsilon (gene 1): -0.0781297
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 311.557
## delta (gene 1): 9.71407
## s (cell 1): 1.00663
## nu (cell 1): 1.02301
## theta (batch 1): 0.0632639
## betas:    0.9375  -0.1543  -0.2335  -0.3105   0.6418   1.6684   0.8784   0.9383   1.6174   0.5738  -0
##
## sigma: 0.179333
## lambda (gene 1): 0.908626
## epsilon (gene 1): -0.442928
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.357
## delta (gene 1): 12.4062
## s (cell 1): 1.03071
## nu (cell 1): 1.22841
## theta (batch 1): 0.0600901
## betas:    1.2667  -0.1523  -0.5829   0.5841   0.5306   0.7872   1.4311   0.6250   1.3621   0.6268  -0
##
## sigma: 0.182434
## lambda (gene 1): 0.82976
## epsilon (gene 1): -0.195912
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 25240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.224
## delta (gene 1): 15.0421
## s (cell 1): 1.14082
## nu (cell 1): 1.02103
## theta (batch 1): 0.0230827
## betas:    1.0577  -0.0881  -0.5592   0.2585   0.5769   1.5675   0.7521   0.9644   1.3002   0.5897  -(
##
## sigma: 0.185756
## lambda (gene 1): 1.30874
## epsilon (gene 1): -0.0136077
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 25280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.749
## delta (gene 1): 19.7
## s (cell 1): 1.10309
## nu (cell 1): 1.0856
## theta (batch 1): 0.0192319
## betas:    1.0721  -0.1164   0.9204  -0.6311   0.7350   1.4795   0.7645   1.1530   1.1051   0.7013  -(
##
## sigma: 0.185891
## lambda (gene 1): 3.04615
## epsilon (gene 1): 0.268248
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 25320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 166.201
## delta (gene 1): 12.8632
## s (cell 1): 1.1765
## nu (cell 1): 1.12888
## theta (batch 1): 0.0240049
## betas:    1.6026  -0.2371  -0.7149  -0.5430   0.5632   1.2382   0.7023   0.8598   1.5168   0.5595  -(
##
## sigma: 0.183217
## lambda (gene 1): 0.816393
```

```
## epsilon (gene 1): -0.167764
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 25360 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.087
## delta (gene 1): 15.7671
## s (cell 1): 1.69905
## nu (cell 1): 1.18625
## theta (batch 1): 0.0282313
## betas:    1.1774  -0.2117   0.2785  -0.8436   1.1515   0.9894   0.9410   1.1754   1.3641   0.6476   (
##
## sigma: 0.181379
## lambda (gene 1): 0.987184
## epsilon (gene 1): 0.0499666
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 25400 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.409
## delta (gene 1): 16.0196
## s (cell 1): 1.08227
## nu (cell 1): 1.05134
## theta (batch 1): 0.0130725
## betas:    1.3297  -0.1068   0.1823   0.2607   0.5190   1.2712   0.8485   0.7792   1.2522   0.5525  -(
##
## sigma: 0.187356
## lambda (gene 1): 1.51154
## epsilon (gene 1): 0.0539123
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 25440 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.003
## delta (gene 1): 16.0267
## s (cell 1): 1.03903
```

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## nu (cell 1): 1.07156
## theta (batch 1): 0.0115554
## betas:    1.1114  -0.0875   0.4418  -0.3726   1.0679   1.0978   1.0009   0.8419   1.1749   0.8458  -
##
## sigma: 0.188884
## lambda (gene 1): 1.00409
## epsilon (gene 1): 0.0398949
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 25480 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.567
## delta (gene 1): 16.6509
## s (cell 1): 1.04
## nu (cell 1): 1.08713
## theta (batch 1): 0.00384158
## betas:    1.3263  -0.1392  -0.0446   0.2100   0.6424   1.1267   0.7433   1.1289   1.0550   0.7081  -
##
## sigma: 0.19979
## lambda (gene 1): 2.29052
## epsilon (gene 1): 0.105672
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 25520 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.203
## delta (gene 1): 15.4916
## s (cell 1): 1.15137
## nu (cell 1): 1.17764
## theta (batch 1): 0.00939814
## betas:    1.6304  -0.1678   0.1205  -0.1883   0.5795   1.0866   0.9191   0.5809   1.4609   0.3675  -
##
## sigma: 0.177802
## lambda (gene 1): 1.45736
## epsilon (gene 1): 0.0169034
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
```

```
## Iteration 25560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.94
## delta (gene 1): 15.8622
## s (cell 1): 1.02111
## nu (cell 1): 1.0499
## theta (batch 1): 0.0120619
## betas:    1.9130  -0.1744  -0.7820   0.1831   0.2976   0.7880   0.9954   0.4833   1.2018   0.6248  -
##
## sigma: 0.187467
## lambda (gene 1): 1.23921
## epsilon (gene 1): 0.0434423
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.016
## delta (gene 1): 12.6067
## s (cell 1): 1.08928
## nu (cell 1): 1.07856
## theta (batch 1): 0.0141518
## betas:    1.0695  -0.2012   0.2702   0.4646   0.4562   1.0683   1.2916   0.8437   1.4532   1.0792  -
##
## sigma: 0.188285
## lambda (gene 1): 0.792239
## epsilon (gene 1): -0.204928
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 284.24
## delta (gene 1): 13.0084
## s (cell 1): 1.27359
## nu (cell 1): 1.14369
## theta (batch 1): 0.0225529
## betas:    1.4189  -0.1640   0.6583  -0.7431   0.8671   1.0388   0.8130   1.1459   0.8587   1.0502  -
##
## sigma: 0.187323
## lambda (gene 1): 0.924758
## epsilon (gene 1): -0.168408
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 25680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.583
## delta (gene 1): 9.12515
## s (cell 1): 0.85099
## nu (cell 1): 1.03807
## theta (batch 1): 0.0323803
## betas:    1.7468   -0.2048    0.1473   -0.0951    0.3191    0.8550    1.0653    0.6006    1.2934    0.6691   -(
##
## sigma: 0.183332
## lambda (gene 1): 0.882524
## epsilon (gene 1): -0.506339
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 25720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.039
## delta (gene 1): 14.0258
## s (cell 1): 0.736542
## nu (cell 1): 1.07919
## theta (batch 1): 0.0216536
## betas:    1.3261   -0.1693    0.1497    0.3803    0.1083    1.2967    0.9370    0.9757    1.1724    0.7080   -(
##
## sigma: 0.189515
## lambda (gene 1): 1.91351
## epsilon (gene 1): -0.0608592
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 25760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 127.05
## delta (gene 1): 14.5087
## s (cell 1): 1.00961
## nu (cell 1): 1.03677
## theta (batch 1): 0.00753841
```

```
## betas:     1.9828  -0.1893  -0.1306  -0.1968   0.0761   0.9956   0.5681   0.9053   0.9914   0.5026  -(
##
## sigma: 0.186277
## lambda (gene 1): 1.03475
## epsilon (gene 1): -0.0211436
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 25800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.304
## delta (gene 1): 15.4694
## s (cell 1): 1.06776
## nu (cell 1): 1.11286
## theta (batch 1): 0.00678092
## betas:     1.6346  -0.2258  -0.3032  -0.1591   0.4120   0.8978   1.0101   0.8584   1.1301   0.9995  -(
##
## sigma: 0.193251
## lambda (gene 1): 2.96262
## epsilon (gene 1): 0.0162478
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 25840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.757
## delta (gene 1): 11.1573
## s (cell 1): 1.07749
## nu (cell 1): 1.0653
## theta (batch 1): 0.00942398
## betas:     1.3895  -0.1729   0.3638  -0.2910   0.7321   1.2001   0.8894   0.8000   1.4495   0.5325  -(
##
## sigma: 0.181222
## lambda (gene 1): 0.377007
## epsilon (gene 1): -0.308164
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 25880 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.036
## delta (gene 1): 12.3154
## s (cell 1): 1.25032
## nu (cell 1): 1.02551
## theta (batch 1): 0.0123197
## betas:    1.0455  -0.0949  -0.1493   0.0533   0.9879   1.2738   0.8153   1.1378   1.0217   0.9535  -
##
## sigma: 0.196546
## lambda (gene 1): 1.13049
## epsilon (gene 1): -0.218502
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 286.299
## delta (gene 1): 9.4166
## s (cell 1): 1.01727
## nu (cell 1): 1.08855
## theta (batch 1): 0.00529958
## betas:    1.0537  -0.2261  -0.1471  -0.5203   0.9571   1.5406   0.6312   1.4106   1.2580   1.0216  -(
##
## sigma: 0.183695
## lambda (gene 1): 1.26674
## epsilon (gene 1): -0.474906
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 25960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.316
## delta (gene 1): 14.7293
## s (cell 1): 0.926256
## nu (cell 1): 1.07863
## theta (batch 1): 0.0093434
## betas:    0.9111  -0.1835   0.1727   0.0638   0.7278   1.2334   1.3270   0.6707   1.9023   0.4452  -(
##
## sigma: 0.186115
## lambda (gene 1): 2.287
## epsilon (gene 1): -0.0289111
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 26000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 138.119
## delta (gene 1): 15.847
## s (cell 1): 0.948049
## nu (cell 1): 1.03619
## theta (batch 1): 0.0308252
## betas:    1.3795  -0.2030   0.0652   0.0497   0.5979   0.8324   1.2249   0.5790   1.7187   0.3993  -(
##
## sigma: 0.181902
## lambda (gene 1): 1.39819
## epsilon (gene 1): 0.0573644
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 26040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.362
## delta (gene 1): 14.7669
## s (cell 1): 1.09849
## nu (cell 1): 1.17421
## theta (batch 1): 0.00431584
## betas:    0.7703  -0.0839   0.3201   0.0519   0.8584   1.0952   1.3805   0.7527   1.5136   0.5266  -(
##
## sigma: 0.185674
## lambda (gene 1): 0.97999
## epsilon (gene 1): -0.0154817
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 26080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.688
## delta (gene 1): 14.1236
## s (cell 1): 1.15226
## nu (cell 1): 1.0488
## theta (batch 1): 0.0242378
## betas:    1.3472  -0.2168  -0.5930   0.1798   0.5465   1.0331   1.0260   0.9129   1.4503   0.6489  -(
##
```

```
## sigma: 0.193807
## lambda (gene 1): 2.80011
## epsilon (gene 1): -0.0629531
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.125
## delta (gene 1): 13.3211
## s (cell 1): 1.25234
## nu (cell 1): 1.04278
## theta (batch 1): 0.0242146
## betas:    1.6973  -0.1875  -0.6100  -0.0438   0.6425   0.9779   0.8927   0.4968   1.6836   0.1986  -(
##
## sigma: 0.187122
## lambda (gene 1): 0.306198
## epsilon (gene 1): -0.132195
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.613
## delta (gene 1): 14.8161
## s (cell 1): 1.18465
## nu (cell 1): 1.0655
## theta (batch 1): 0.0163167
## betas:    1.3974  -0.1221  -0.3500  -0.2405   1.1807   0.7795   1.0527   0.5885   1.5288   0.2082  -(
##
## sigma: 0.186241
## lambda (gene 1): 0.903359
## epsilon (gene 1): -0.0298358
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.213
```

```
## delta (gene 1): 14.2368
## s (cell 1): 1.32762
## nu (cell 1): 1.04703
## theta (batch 1): 0.0610336
## betas:    0.7126  -0.0072   0.3073   0.4368   0.7626   1.4738   1.0121   0.9735   1.1430   0.5792  -(
##
## sigma: 0.191371
## lambda (gene 1): 1.27071
## epsilon (gene 1): -0.0438753
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 26240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.098
## delta (gene 1): 10.6949
## s (cell 1): 0.990201
## nu (cell 1): 1.06267
## theta (batch 1): 0.0112932
## betas:    1.2955  -0.0735   0.1356  -0.3778   0.9051   0.8672   0.9670   0.9439   0.9190   0.6094  -(
##
## sigma: 0.185147
## lambda (gene 1): 1.43817
## epsilon (gene 1): -0.329404
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 26280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 120.5
## delta (gene 1): 15.7045
## s (cell 1): 1.10353
## nu (cell 1): 1.08413
## theta (batch 1): 0.00560443
## betas:    1.0601  -0.0055  -0.3305   0.3265   0.9361   1.0266   1.1349   0.6388   1.1577   0.5523  -:
##
## sigma: 0.171586
## lambda (gene 1): 1.27974
## epsilon (gene 1): 0.0336383
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

```
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.496
## delta (gene 1): 20.118
## s (cell 1): 1.00254
## nu (cell 1): 1.07817
## theta (batch 1): 0.006854
## betas:    0.4445  -0.0717  -0.1752  -0.0145   1.5159   1.0115   1.5277   0.8960   1.4681   0.7798  -(
##
## sigma: 0.187928
## lambda (gene 1): 0.893501
## epsilon (gene 1): 0.299257
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.184
## delta (gene 1): 13.0389
## s (cell 1): 1.22884
## nu (cell 1): 1.07428
## theta (batch 1): 0.00552601
## betas:    1.3766  -0.0761  -0.6261  -0.2089   0.6542   1.4208   0.3672   1.3819   0.5533   0.8924  -
##
## sigma: 0.19062
## lambda (gene 1): 1.1996
## epsilon (gene 1): -0.129933
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.462
## delta (gene 1): 14.4787
## s (cell 1): 1.17423
## nu (cell 1): 1.14543
## theta (batch 1): 0.00256541
## betas:    1.1888  -0.0770  -1.4648   0.0329   1.4450   0.7342   1.0519   0.9064   1.0959   0.5460  -(
##
## sigma: 0.192212
## lambda (gene 1): 1.39465
```

```
## epsilon (gene 1): -0.058324
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 26440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.588
## delta (gene 1): 14.1789
## s (cell 1): 1.12247
## nu (cell 1): 1.05129
## theta (batch 1): 0.00172145
## betas:    0.9362    0.0321   -0.5539   -0.2800    1.4800    0.9735    1.2465    0.4963    1.3375    0.3159   -
##
## sigma: 0.186046
## lambda (gene 1): 0.632005
## epsilon (gene 1): -0.0636921
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 26480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.326
## delta (gene 1): 15.4936
## s (cell 1): 1.14327
## nu (cell 1): 1.16376
## theta (batch 1): 0.00103308
## betas:    0.9289   -0.1511   -0.6178    0.2944    0.5722    1.4955    0.8265    1.2621    1.1680    1.0381   -(
##
## sigma: 0.185161
## lambda (gene 1): 1.13915
## epsilon (gene 1): 0.0411796
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 26520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.652
## delta (gene 1): 14.1957
## s (cell 1): 1.0124
```

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## nu (cell 1): 1.04193
## theta (batch 1): 0.000873761
## betas:     1.4713  -0.2093  -0.1492  -0.5895   0.7925   0.8138   1.1769   0.7566   1.2789   0.8945  -(
##
## sigma: 0.181711
## lambda (gene 1): 0.411591
## epsilon (gene 1): -0.0668625
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 26560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.852
## delta (gene 1): 19.7238
## s (cell 1): 1.05862
## nu (cell 1): 1.06744
## theta (batch 1): 0.00103686
## betas:     1.9648  -0.1927  -0.6791  -0.4287   0.7536   0.5061   1.0698   0.4356   1.4095   0.2667  -(
##
## sigma: 0.18203
## lambda (gene 1): 0.113322
## epsilon (gene 1): 0.269832
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 26600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.681
## delta (gene 1): 14.0796
## s (cell 1): 1.12999
## nu (cell 1): 1.0731
## theta (batch 1): 0.000674034
## betas:     1.4643  -0.1631  -0.3768   0.0334   0.8756   0.8196   1.1850   0.5560   1.5149   0.3170  -(
##
## sigma: 0.179536
## lambda (gene 1): 0.867382
## epsilon (gene 1): -0.0617416
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
```

```
## Iteration 26640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.738
## delta (gene 1): 14.9861
## s (cell 1): 1.09298
## nu (cell 1): 1.09362
## theta (batch 1): 0.000527023
## betas:    2.2434  -0.1641  -0.9269  -0.1990   0.6835   0.3359   1.0834   0.2328   1.1474   0.4993  -
##
## sigma: 0.18258
## lambda (gene 1): 1.67372
## epsilon (gene 1): -0.0258724
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 26680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.331
## delta (gene 1): 13.6473
## s (cell 1): 1.13277
## nu (cell 1): 1.17302
## theta (batch 1): 0.000423835
## betas:    1.3413  -0.1389   0.2740  -0.1785   0.8771   0.6690   1.3028   0.6219   1.3883   0.5744  -
##
## sigma: 0.191571
## lambda (gene 1): 1.6242
## epsilon (gene 1): -0.107493
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 26720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.456
## delta (gene 1): 15.9179
## s (cell 1): 1.03407
## nu (cell 1): 1.04044
## theta (batch 1): 0.00100545
## betas:    1.2513  -0.1039  -0.5166   0.1297   0.8998   0.8612   1.1539   0.6767   1.3529   0.4905  -
##
## sigma: 0.183211
## lambda (gene 1): 0.454104
## epsilon (gene 1): 0.0485726
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.611
## delta (gene 1): 13.1758
## s (cell 1): 1.04
## nu (cell 1): 1.03297
## theta (batch 1): 0.000920756
## betas:    1.4972  -0.1029   0.2130  -0.0705   0.9348   0.8070   0.9857   0.7727   0.9947   0.6677  -(
##
## sigma: 0.195127
## lambda (gene 1): 1.79125
## epsilon (gene 1): -0.145414
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 165.811
## delta (gene 1): 14.6318
## s (cell 1): 1.08382
## nu (cell 1): 1.08355
## theta (batch 1): 0.000100964
## betas:    1.5090  -0.1884   0.1861  -0.7970   0.6626   1.2601   0.6694   0.9178   1.3950   0.4844  -(
##
## sigma: 0.18951
## lambda (gene 1): 1.01491
## epsilon (gene 1): -0.0224374
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 26840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 127.93
## delta (gene 1): 15.782
## s (cell 1): 1.06186
## nu (cell 1): 1.05409
## theta (batch 1): 0.000171899
```

```
## betas:       1.2850  -0.1094  -0.1914   0.0844   0.7602   0.9853   0.9710   0.9171   1.0780   0.6378  -(
##
## sigma: 0.192751
## lambda (gene 1): 3.33697
## epsilon (gene 1): 0.0540581
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 26880 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.45
## delta (gene 1): 14.5922
## s (cell 1): 1.03279
## nu (cell 1): 1.0519
## theta (batch 1): 0.000147835
## betas:       1.2759  -0.2581  -0.6271   0.0073   0.2270   1.0833   1.3684   0.6748   1.7620   0.5462   (
##
## sigma: 0.193924
## lambda (gene 1): 0.369243
## epsilon (gene 1): -0.0288291
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 26920 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.559
## delta (gene 1): 12.8434
## s (cell 1): 1.12813
## nu (cell 1): 1.11427
## theta (batch 1): 0.000282256
## betas:       1.1308  -0.1156  -0.5694   0.5446   0.1910   1.6678   0.6881   1.2016   0.9735   0.7544  -(
##
## sigma: 0.182533
## lambda (gene 1): 1.48485
## epsilon (gene 1): -0.140618
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 26960 out of 40000 has been completed.
## ------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.684
## delta (gene 1): 15.1912
## s (cell 1): 1.09477
## nu (cell 1): 1.09215
## theta (batch 1): 0.000414924
## betas:    1.0425  -0.1818   0.2087  -0.2310   0.8079   0.9475   1.2050   1.0489   1.1892   1.0663  -(
##
## sigma: 0.184315
## lambda (gene 1): 1.00007
## epsilon (gene 1): 0.0199678
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 27000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 221.442
## delta (gene 1): 10.0535
## s (cell 1): 1.06336
## nu (cell 1): 1.07254
## theta (batch 1): 0.000339747
## betas:    1.3405  -0.1418  -0.1911   0.2965   0.5998   1.0262   0.9914   0.8524   1.2899   0.4249  -(
##
## sigma: 0.182128
## lambda (gene 1): 0.241019
## epsilon (gene 1): -0.404605
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 27040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.231
## delta (gene 1): 14.8399
## s (cell 1): 1.12161
## nu (cell 1): 1.11238
## theta (batch 1): 0.000147395
## betas:    0.9019  -0.0456  -0.1896   0.4224   1.1254   1.0278   0.9982   1.0223   1.0986   0.6155  -(
##
## sigma: 0.18099
## lambda (gene 1): 1.88556
## epsilon (gene 1): -0.0181343
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

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## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 27080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.41
## delta (gene 1): 16.9802
## s (cell 1): 1.15955
## nu (cell 1): 1.14442
## theta (batch 1): 0.000165566
## betas:    0.6427   0.0542  -0.7023   1.0398   0.8758   1.3119   1.1581   0.6931   1.3247   0.4131  -
##
## sigma: 0.183071
## lambda (gene 1): 0.720697
## epsilon (gene 1): 0.104134
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 27120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.944
## delta (gene 1): 10.4841
## s (cell 1): 1.0385
## nu (cell 1): 1.01654
## theta (batch 1): 0.000639151
## betas:    1.5112  -0.1795  -1.0272   0.0749   0.5403   0.9708   0.8337   1.0467   0.9790   0.9821  -
##
## sigma: 0.183572
## lambda (gene 1): 0.265417
## epsilon (gene 1): -0.36682
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 27160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.31
## delta (gene 1): 14.9238
## s (cell 1): 1.08458
## nu (cell 1): 1.07066
## theta (batch 1): 0.000865281
## betas:    1.5667  -0.0677  -1.1015  -0.2407   0.9060   0.9863   0.7021   0.8683   0.8914   0.4938  -
##
```

```
## sigma: 0.182147
## lambda (gene 1): 0.439375
## epsilon (gene 1): -0.00871273
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 27200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.631
## delta (gene 1): 15.7285
## s (cell 1): 1.10574
## nu (cell 1): 1.11079
## theta (batch 1): 0.000724552
## betas:    1.1559  -0.0614  -0.1414  -0.2761   0.4912   1.6847   0.5381   1.0529   1.1643   0.2526  -(
##
## sigma: 0.190556
## lambda (gene 1): 0.553048
## epsilon (gene 1): 0.0582749
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 27240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.295
## delta (gene 1): 15.7597
## s (cell 1): 1.08666
## nu (cell 1): 1.12136
## theta (batch 1): 0.000435385
## betas:    0.8596  -0.1110  -1.1746   0.4628   0.8491   1.4528   0.8371   1.0821   1.4913   0.4308  -(
##
## sigma: 0.182031
## lambda (gene 1): 1.26602
## epsilon (gene 1): 0.054923
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 27280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.747
```

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## delta (gene 1): 13.1555
## s (cell 1): 1.1017
## nu (cell 1): 1.09695
## theta (batch 1): 0.000677538
## betas:    1.6314  -0.1134  -0.3486  -0.4518   0.6135   1.0516   0.8452   0.6283   1.2721   0.2971  -(
##
## sigma: 0.180941
## lambda (gene 1): 0.847329
## epsilon (gene 1): -0.147305
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 27320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 108.08
## delta (gene 1): 10.6769
## s (cell 1): 0.996364
## nu (cell 1): 1.08305
## theta (batch 1): 0.00574816
## betas:    1.3472  -0.1333   0.4405  -0.4818   0.5585   1.4021   0.7527   0.8853   1.2182   0.6627  -(
##
## sigma: 0.179406
## lambda (gene 1): 0.837703
## epsilon (gene 1): -0.341575
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 27360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.387
## delta (gene 1): 17.0832
## s (cell 1): 1.08598
## nu (cell 1): 1.09356
## theta (batch 1): 0.00558309
## betas:    1.2023  -0.0947  -0.1378   0.2205   0.3948   1.5731   0.5931   1.0850   1.1425   0.5281  -(
##
## sigma: 0.188199
## lambda (gene 1): 0.382682
## epsilon (gene 1): 0.136347
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 27400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.095
## delta (gene 1): 12.848
## s (cell 1): 1.1124
## nu (cell 1): 1.14362
## theta (batch 1): 0.00171385
## betas:    1.2061  -0.1237   0.4543  -0.5938   0.3739   1.6082   0.7452   0.9328   1.2931   0.6130  -(
##
## sigma: 0.183307
## lambda (gene 1): 0.257652
## epsilon (gene 1): -0.145746
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 27440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 285.691
## delta (gene 1): 17.5326
## s (cell 1): 1.19289
## nu (cell 1): 1.17776
## theta (batch 1): 0.00132636
## betas:    0.8306  -0.1819  -0.0440   0.3022   0.7490   1.1272   1.4866   0.5945   1.9317   0.5572  -(
##
## sigma: 0.183134
## lambda (gene 1): 0.403434
## epsilon (gene 1): 0.149672
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 27480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.333
## delta (gene 1): 14.874
## s (cell 1): 1.08647
## nu (cell 1): 1.06264
## theta (batch 1): 0.0034594
## betas:    1.9515  -0.1750  -0.6704  -0.0034   0.2243   1.1766   0.6285   0.4608   1.5713   0.0963  -(
##
## sigma: 0.183452
## lambda (gene 1): 1.29829
```

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## epsilon (gene 1): -0.0168908
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 27520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.033
## delta (gene 1): 12.8921
## s (cell 1): 1.07845
## nu (cell 1): 1.13499
## theta (batch 1): 0.00309029
## betas:    1.8963  -0.1846  -0.5121  -0.3290   0.1418   1.1713   0.8740   0.4887   1.3358   0.4246   -(
##
## sigma: 0.187438
## lambda (gene 1): 0.140788
## epsilon (gene 1): -0.162822
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 27560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 169.081
## delta (gene 1): 18.0445
## s (cell 1): 0.948109
## nu (cell 1): 1.09544
## theta (batch 1): 0.00626345
## betas:    1.1833  -0.2353  -0.2424  -0.1206   0.7351   0.8790   1.2205   0.8741   1.7400   0.4231   (
##
## sigma: 0.180455
## lambda (gene 1): 0.88778
## epsilon (gene 1): 0.184534
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 27600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.753
## delta (gene 1): 13.5484
## s (cell 1): 1.06647
```

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## nu (cell 1): 1.12613
## theta (batch 1): 0.00152092
## betas:    1.6216  -0.2205   0.1902  -0.3847   0.6342   1.1741   0.5036   1.2828   1.0103   0.7515  -(
##
## sigma: 0.188931
## lambda (gene 1): 1.20606
## epsilon (gene 1): -0.0926033
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 27640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.118
## delta (gene 1): 12.4716
## s (cell 1): 1.09448
## nu (cell 1): 1.09843
## theta (batch 1): 0.000442017
## betas:    1.7810  -0.1839   0.1376   0.5114   0.2617   0.7696   0.9146   0.8527   0.9099   0.8799  -(
##
## sigma: 0.186563
## lambda (gene 1): 0.790772
## epsilon (gene 1): -0.198557
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 27680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 153.494
## delta (gene 1): 13.5197
## s (cell 1): 1.04911
## nu (cell 1): 1.07017
## theta (batch 1): 0.0013683
## betas:    1.0084  -0.1385   0.6461   0.2848   0.3802   1.8419   0.5313   1.2216   1.3391   0.5625  -(
##
## sigma: 0.184842
## lambda (gene 1): 0.651015
## epsilon (gene 1): -0.0942517
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
```

```
## Iteration 27720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.759
## delta (gene 1): 10.9977
## s (cell 1): 1.022
## nu (cell 1): 1.03024
## theta (batch 1): 0.0013009
## betas:    1.3556  -0.2666   0.0213   0.1602  -0.0093   1.4617   0.7275   1.2186   1.2596   1.0605  -(
##
## sigma: 0.181761
## lambda (gene 1): 1.13493
## epsilon (gene 1): -0.315248
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 27760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 138.858
## delta (gene 1): 18.1262
## s (cell 1): 1.05389
## nu (cell 1): 1.14529
## theta (batch 1): 0.00282155
## betas:    1.6484  -0.2340   0.1121  -0.4748   0.7691   0.7523   1.0140   0.8084   1.3104   0.8824  -
##
## sigma: 0.180375
## lambda (gene 1): 1.57637
## epsilon (gene 1): 0.181032
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 27800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 326.924
## delta (gene 1): 14.212
## s (cell 1): 1.05596
## nu (cell 1): 1.08504
## theta (batch 1): 0.00170126
## betas:    1.3735  -0.1834  -0.1718   0.2797   0.5361   1.4538   0.5160   1.1061   1.3695   0.4638  -(
##
## sigma: 0.184757
## lambda (gene 1): 1.40161
## epsilon (gene 1): -0.0556459
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------
## Iteration 27840 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 150.891
## delta (gene 1): 13.8986
## s (cell 1): 1.19917
## nu (cell 1): 1.10488
## theta (batch 1): 0.00190661
## betas:   1.4898  -0.1899   0.0347  -0.2961   0.6485   1.1289   0.6861   1.1907   0.9334   0.9478  -(
##
## sigma: 0.186763
## lambda (gene 1): 1.14744
## epsilon (gene 1): -0.0872536
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------
## Iteration 27880 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.886
## delta (gene 1): 13.3688
## s (cell 1): 1.04605
## nu (cell 1): 1.05579
## theta (batch 1): 0.000658016
## betas:   1.4682  -0.0349  -0.0730  -0.1256   0.7180   1.4264   0.2808   1.2010   0.7851   0.2377  -(
##
## sigma: 0.186159
## lambda (gene 1): 0.673411
## epsilon (gene 1): -0.0986261
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------
## Iteration 27920 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.226
## delta (gene 1): 14.333
## s (cell 1): 1.06469
## nu (cell 1): 1.09731
## theta (batch 1): 0.000507236
```

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## betas:      1.4930  -0.2155  -0.2629  -0.0268   0.8867   0.4413   1.3599   0.5716   1.5790   0.6511  -(
##
## sigma: 0.185779
## lambda (gene 1): 0.195538
## epsilon (gene 1): -0.0562233
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 27960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 161.049
## delta (gene 1): 14.22
## s (cell 1): 0.974587
## nu (cell 1): 1.00013
## theta (batch 1): 0.000264116
## betas:      1.2429  -0.0685  -0.6834   0.4732   0.6681   1.2148   0.7398   1.1510   0.7275   0.8498  -(
##
## sigma: 0.182634
## lambda (gene 1): 1.24329
## epsilon (gene 1): -0.0530662
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 28000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.122
## delta (gene 1): 13.194
## s (cell 1): 1.01388
## nu (cell 1): 0.994208
## theta (batch 1): 0.000136786
## betas:      1.1989  -0.1431  -0.0590  -0.5629   0.9623   1.3003   0.6913   1.0599   1.3369   0.5822  -(
##
## sigma: 0.191434
## lambda (gene 1): 1.56937
## epsilon (gene 1): -0.130071
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 28040 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 165.994
## delta (gene 1): 13.9762
## s (cell 1): 1.09414
## nu (cell 1): 1.13142
## theta (batch 1): 0.000291369
## betas:    1.0555  -0.1156  -0.2800  -0.0986   0.6727   1.5307   0.7284   1.0284   1.3290   0.5790  -(
##
## sigma: 0.189434
## lambda (gene 1): 1.02509
## epsilon (gene 1): -0.0769617
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 28080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.323
## delta (gene 1): 13.7455
## s (cell 1): 1.03207
## nu (cell 1): 1.06318
## theta (batch 1): 0.000120775
## betas:    1.0022  -0.0225  -0.2261  -0.0412   0.6106   1.3668   0.9907   0.7329   1.3188   0.2425  -(
##
## sigma: 0.184197
## lambda (gene 1): 0.933628
## epsilon (gene 1): -0.0964231
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 28120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.547
## delta (gene 1): 12.9998
## s (cell 1): 1.12727
## nu (cell 1): 1.1089
## theta (batch 1): 0.000184852
## betas:    1.0007  -0.1640  -0.4441   0.3316   1.0118   1.2041   0.7105   1.4528   1.0109   1.0240  -(
##
## sigma: 0.183493
## lambda (gene 1): 1.11426
## epsilon (gene 1): -0.160383
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 28160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 259.051
## delta (gene 1): 15.3721
## s (cell 1): 1.03115
## nu (cell 1): 1.00492
## theta (batch 1): 0.000577655
## betas:    1.9023  -0.0885  -0.0501  -0.5887   0.7186   0.9149   0.5752   0.7638   0.7865   0.5450  -
##
## sigma: 0.191393
## lambda (gene 1): 0.511285
## epsilon (gene 1): 0.0147989
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 28200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 95.6771
## delta (gene 1): 21.9731
## s (cell 1): 0.996298
## nu (cell 1): 1.09377
## theta (batch 1): 0.0130762
## betas:    1.2669  -0.0987  -0.3135  -0.3389   0.9627   1.2872   0.7689   0.9533   1.1685   0.3990  -
##
## sigma: 0.179738
## lambda (gene 1): 1.3966
## epsilon (gene 1): 0.370058
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 28240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 345.866
## delta (gene 1): 13.1422
## s (cell 1): 1.12914
## nu (cell 1): 1.12552
## theta (batch 1): 0.0141683
## betas:    1.9241  -0.1215   0.3544  -0.5201   0.5371   0.9852   0.6490   0.6610   1.0574   0.2955  -
##
```

```
## sigma: 0.182216
## lambda (gene 1): 0.649158
## epsilon (gene 1): -0.138649
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 28280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.573
## delta (gene 1): 18.5798
## s (cell 1): 1.14548
## nu (cell 1): 1.10178
## theta (batch 1): 0.00279287
## betas:    1.0021  -0.1470  -0.5479  -0.0111   1.1029   1.3921   0.5692   1.4639   1.0898   0.6520  -(
##
## sigma: 0.185841
## lambda (gene 1): 0.837353
## epsilon (gene 1): 0.244484
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 28320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 279.798
## delta (gene 1): 9.91
## s (cell 1): 1.15734
## nu (cell 1): 1.04461
## theta (batch 1): 0.00455441
## betas:    1.1774  -0.1308  -1.0009  -0.1005   1.1109   0.8362   0.9526   1.1490   1.0359   0.6861  -(
##
## sigma: 0.176436
## lambda (gene 1): 0.717128
## epsilon (gene 1): -0.403064
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 28360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.624
```

```
## delta (gene 1): 14.5637
## s (cell 1): 1.03136
## nu (cell 1): 1.09392
## theta (batch 1): 0.00618
## betas:    1.3491  -0.0690  -1.1593   0.0720   1.2241   0.7185   0.7672   1.1433   0.7509   0.7826  -
##
## sigma: 0.185664
## lambda (gene 1): 0.792121
## epsilon (gene 1): -0.0348264
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 28400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 352.963
## delta (gene 1): 13.1487
## s (cell 1): 1.10734
## nu (cell 1): 1.10215
## theta (batch 1): 0.0124091
## betas:    0.9782  -0.1012  -0.8294  -0.1538   1.5806   0.7240   1.1070   1.0579   1.1762   0.7747  -
##
## sigma: 0.187278
## lambda (gene 1): 1.31598
## epsilon (gene 1): -0.136967
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 28440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.532
## delta (gene 1): 17.9788
## s (cell 1): 1.09329
## nu (cell 1): 1.14846
## theta (batch 1): 0.0168313
## betas:    0.6946  -0.0764  -0.3329   0.1706   1.2030   1.0184   1.4112   0.7826   1.4927   0.5512  -
##
## sigma: 0.175933
## lambda (gene 1): 0.775017
## epsilon (gene 1): 0.165516
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

```
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 28480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 118.605
## delta (gene 1): 13.1303
## s (cell 1): 0.882233
## nu (cell 1): 1.09525
## theta (batch 1): 0.0195948
## betas:   1.1564  -0.0812  -0.1723  -0.5371   0.9722   1.2675   0.8158   0.8985   1.2613   0.4014  -(
##
## sigma: 0.179226
## lambda (gene 1): 1.15433
## epsilon (gene 1): -0.1352
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 28520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.184
## delta (gene 1): 14.2037
## s (cell 1): 1.20794
## nu (cell 1): 1.04815
## theta (batch 1): 0.0205097
## betas:   0.7512  -0.0618   0.9144  -0.5131   1.1550   1.0797   1.2063   0.9102   1.3297   0.6657  -(
##
## sigma: 0.18194
## lambda (gene 1): 1.52116
## epsilon (gene 1): -0.0490187
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 28560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 193.209
## delta (gene 1): 10.5669
## s (cell 1): 1.11517
## nu (cell 1): 1.04195
## theta (batch 1): 0.0160614
## betas:   1.2988  -0.2001  -0.9494   0.0726   0.6426   1.1771   0.7701   1.3019   0.9331   1.1552  -(
##
## sigma: 0.193419
## lambda (gene 1): 1.42006
```

```
## epsilon (gene 1): -0.348736
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 28600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.77
## delta (gene 1): 16.7959
## s (cell 1): 0.853954
## nu (cell 1): 1.03781
## theta (batch 1): 0.0132801
## betas:    1.1606  -0.1946  -1.2944  -0.4113   1.4208   0.6373   1.2801   0.7865   1.6814   0.4102  -(
##
## sigma: 0.193656
## lambda (gene 1): 1.11099
## epsilon (gene 1): 0.107891
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 28640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 150.44
## delta (gene 1): 15.9131
## s (cell 1): 1.00369
## nu (cell 1): 1.05349
## theta (batch 1): 0.00828384
## betas:    1.3863  -0.1277  -0.4862   0.0440   0.5833   1.3018   0.4944   1.3045   0.7270   1.0305  -(
##
## sigma: 0.191764
## lambda (gene 1): 1.16113
## epsilon (gene 1): 0.0420391
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 28680 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.144
## delta (gene 1): 15.9786
## s (cell 1): 1.0822
```

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## nu (cell 1): 1.06056
## theta (batch 1): 0.00249647
## betas:     0.8886    0.0500    0.1477   -0.0469    1.2577    1.0725    1.0059    0.9406    0.7151    0.9515   -
##
## sigma: 0.188337
## lambda (gene 1): 0.500876
## epsilon (gene 1): 0.0601629
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 28720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.272
## delta (gene 1): 14.6497
## s (cell 1): 1.02867
## nu (cell 1): 1.07669
## theta (batch 1): 0.00449813
## betas:     1.0739   -0.0396    0.3772    0.1372    0.7454    1.2796    0.8972    0.8746    1.1914    0.3396   -
##
## sigma: 0.197483
## lambda (gene 1): 0.603889
## epsilon (gene 1): -0.0313344
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 28760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.129
## delta (gene 1): 14.0389
## s (cell 1): 1.09515
## nu (cell 1): 1.13223
## theta (batch 1): 0.0042038
## betas:     1.5090   -0.1074   -0.9420    0.5230    0.4126    1.2182    0.6040    1.0201    0.8999    0.6825   -
##
## sigma: 0.192327
## lambda (gene 1): 0.380777
## epsilon (gene 1): -0.0672733
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
```

```
## Iteration 28800 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 254.39
## delta (gene 1): 18.2935
## s (cell 1): 1.19054
## nu (cell 1): 1.19094
## theta (batch 1): 0.00100082
## betas:    1.4686  -0.1224  -0.2058  -0.4221   0.6241   0.9399   1.0717   0.7315   1.0497   0.8926  -
##
## sigma: 0.183869
## lambda (gene 1): 0.622709
## epsilon (gene 1): 0.200367
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 28840 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.897
## delta (gene 1): 12.9171
## s (cell 1): 1.14372
## nu (cell 1): 1.15002
## theta (batch 1): 0.0035947
## betas:    1.6933  -0.0206  -0.0901  -0.0599   0.5638   1.2109   0.2527   1.1657   0.5282   0.3321  -
##
## sigma: 0.188004
## lambda (gene 1): 0.373071
## epsilon (gene 1): -0.157143
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 28880 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.027
## delta (gene 1): 15.3645
## s (cell 1): 1.05699
## nu (cell 1): 1.08539
## theta (batch 1): 0.00323462
## betas:    1.4886  -0.1231  -0.7793  -0.3091   0.7717   1.1763   0.6605   0.9939   0.9562   0.6971  -
##
## sigma: 0.184951
## lambda (gene 1): 1.1162
## epsilon (gene 1): 0.0106737
## ------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 28920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.169
## delta (gene 1): 13.0733
## s (cell 1): 1.06113
## nu (cell 1): 1.09422
## theta (batch 1): 0.0038496
## betas:    1.4208  -0.1651   0.0701  -0.6616   0.8625   1.2126   0.5825   1.1705   1.1087   0.5737  -(
##
## sigma: 0.189422
## lambda (gene 1): 1.75344
## epsilon (gene 1): -0.136679
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 28960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 128.393
## delta (gene 1): 12.3769
## s (cell 1): 0.883266
## nu (cell 1): 1.0442
## theta (batch 1): 0.010336
## betas:    0.9297  -0.1770   0.6965  -0.1194   0.2842   1.9215   0.5733   1.4083   1.2244   0.8671  -(
##
## sigma: 0.168228
## lambda (gene 1): 0.823547
## epsilon (gene 1): -0.201164
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 29000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.385
## delta (gene 1): 11.5297
## s (cell 1): 0.898349
## nu (cell 1): 1.1064
## theta (batch 1): 0.0242813
```

```
## betas:      1.7538  -0.2210  -0.3168  -0.6139   0.7339   0.9039   1.0499   0.4909   1.5018   0.6727  -(
##
## sigma: 0.190002
## lambda (gene 1): 1.92287
## epsilon (gene 1): -0.278012
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 29040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.3
## delta (gene 1): 11.7976
## s (cell 1): 1.00307
## nu (cell 1): 1.08666
## theta (batch 1): 0.0162354
## betas:      0.9880  -0.1751  -0.2104   0.4255   0.7169   1.0598   1.1823   0.8975   1.5917   0.6837  -(
##
## sigma: 0.189942
## lambda (gene 1): 0.669173
## epsilon (gene 1): -0.249058
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 29080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.938
## delta (gene 1): 15.8365
## s (cell 1): 1.14124
## nu (cell 1): 1.03084
## theta (batch 1): 0.0159657
## betas:      1.7942  -0.1124   0.8442  -0.0029   0.2655   0.7571   1.1650   0.2215   1.4738   0.0758  -(
##
## sigma: 0.179887
## lambda (gene 1): 2.14153
## epsilon (gene 1): 0.0479669
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 29120 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.235
## delta (gene 1): 16.9201
## s (cell 1): 0.984049
## nu (cell 1): 1.04696
## theta (batch 1): 0.0119479
## betas:    1.2073  -0.1140  -0.1552   0.5775   0.7023   1.1026   0.9034   1.0232   1.0889   0.7698  -
##
## sigma: 0.192596
## lambda (gene 1): 2.53585
## epsilon (gene 1): 0.127633
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 221.806
## delta (gene 1): 12.8944
## s (cell 1): 1.16001
## nu (cell 1): 1.00693
## theta (batch 1): 0.0242723
## betas:    2.1344  -0.1868   0.0072  -0.3791   0.2007   0.9465   0.7100   0.4925   1.3672   0.1016  -
##
## sigma: 0.180351
## lambda (gene 1): 1.61465
## epsilon (gene 1): -0.164941
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 311.341
## delta (gene 1): 14.7525
## s (cell 1): 1.10278
## nu (cell 1): 1.07979
## theta (batch 1): 0.0316273
## betas:    0.8695  -0.0934   0.0599  -0.4583   1.1721   1.5485   0.4659   1.4419   1.0803   0.7241  -
##
## sigma: 0.181398
## lambda (gene 1): 1.62286
## epsilon (gene 1): -0.0201577
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.376
## delta (gene 1): 19.8062
## s (cell 1): 1.00404
## nu (cell 1): 1.11895
## theta (batch 1): 0.0186254
## betas:    0.4327  -0.1110  -0.6393  -0.4529   1.7069   1.3652   0.7214   1.8139   0.8934   1.2660  -(
##
## sigma: 0.189935
## lambda (gene 1): 0.49555
## epsilon (gene 1): 0.268529
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.305
## delta (gene 1): 14.7508
## s (cell 1): 1.16581
## nu (cell 1): 1.19529
## theta (batch 1): 0.0197576
## betas:    0.1949  -0.0362  -0.9578   0.8899   0.5522   1.9206   1.0961   1.0593   1.6562   0.5698  -(
##
## sigma: 0.192592
## lambda (gene 1): 1.26003
## epsilon (gene 1): -0.0340168
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.464
## delta (gene 1): 15.5226
## s (cell 1): 0.970021
## nu (cell 1): 1.02398
## theta (batch 1): 0.0255539
## betas:    1.2297  -0.0965  -1.4330   0.4894   1.1387   0.6285   1.2450   0.7485   1.2271   0.5409  -(
##
```

```
## sigma: 0.175344
## lambda (gene 1): 0.656068
## epsilon (gene 1): 0.0379147
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 29360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.138
## delta (gene 1): 8.89896
## s (cell 1): 0.983909
## nu (cell 1): 1.08006
## theta (batch 1): 0.0268359
## betas:    1.4954  -0.2008  -0.6531  -0.0678   0.6737   0.9038   0.9812   0.9613   1.1860   0.7800  -(
##
## sigma: 0.182228
## lambda (gene 1): 1.00821
## epsilon (gene 1): -0.509497
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 29400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.243
## delta (gene 1): 13.7682
## s (cell 1): 1.01257
## nu (cell 1): 1.11491
## theta (batch 1): 0.0192805
## betas:    1.6564  -0.1780  -0.7158  -0.5706   0.9508   1.1000   0.4582   1.0790   1.1535   0.4520  -(
##
## sigma: 0.197634
## lambda (gene 1): 0.981228
## epsilon (gene 1): -0.105062
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 29440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.154
```

```
## delta (gene 1): 14.1114
## s (cell 1): 0.888253
## nu (cell 1): 1.0383
## theta (batch 1): 0.0316965
## betas:    1.1900  -0.0733   0.1852  -0.0015   0.6393   0.9537   1.4173   0.3606   1.5242   0.3332  -(
##
## sigma: 0.185854
## lambda (gene 1): 0.466292
## epsilon (gene 1): -0.0589233
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 273.374
## delta (gene 1): 13.1127
## s (cell 1): 1.58673
## nu (cell 1): 1.08834
## theta (batch 1): 0.028905
## betas:    0.6323  -0.0405  -0.1472   0.2117   1.0291   1.5745   0.8105   1.2322   1.2250   0.4779  -(
##
## sigma: 0.184278
## lambda (gene 1): 2.38408
## epsilon (gene 1): -0.120786
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.357
## delta (gene 1): 16.0836
## s (cell 1): 1.29077
## nu (cell 1): 1.11482
## theta (batch 1): 0.0236536
## betas:    1.0677  -0.1553  -0.5598   0.2515   0.8847   1.2095   0.9587   0.9248   1.6517   0.2287  -(
##
## sigma: 0.174923
## lambda (gene 1): 0.970596
## epsilon (gene 1): 0.0826796
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

```
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.611
## delta (gene 1): 17.2761
## s (cell 1): 0.76473
## nu (cell 1): 1.07075
## theta (batch 1): 0.0216276
## betas:    1.3343  -0.1583  -0.4859  -0.0830   0.5950   0.9782   1.2091   0.4815   1.7914   0.1626  -(
##
## sigma: 0.183086
## lambda (gene 1): 0.809681
## epsilon (gene 1): 0.144211
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 130.758
## delta (gene 1): 12.3992
## s (cell 1): 1.15001
## nu (cell 1): 1.08867
## theta (batch 1): 0.020268
## betas:    0.6059  -0.1145  -0.7585   0.8133   0.9010   1.2840   1.2219   0.9792   1.6261   0.6646  -(
##
## sigma: 0.186296
## lambda (gene 1): 0.956118
## epsilon (gene 1): -0.189751
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 271.479
## delta (gene 1): 14.19
## s (cell 1): 1.16555
## nu (cell 1): 1.08468
## theta (batch 1): 0.0143769
## betas:    0.9663  -0.1048  -0.0866   0.3945   0.4642   1.3995   0.9877   0.9166   1.3544   0.6205  -(
##
## sigma: 0.185724
## lambda (gene 1): 1.06333
```

```
## epsilon (gene 1): -0.065258
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 29680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 254.354
## delta (gene 1): 12.7697
## s (cell 1): 0.950549
## nu (cell 1): 1.04454
## theta (batch 1): 0.0341027
## betas:     1.0396  -0.1491  -0.1249  -0.2922   0.7375   1.3413   0.9376   0.9616   1.4478   0.5831  -(
##
## sigma: 0.184333
## lambda (gene 1): 0.478691
## epsilon (gene 1): -0.171287
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 29720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.799
## delta (gene 1): 10.2991
## s (cell 1): 0.845144
## nu (cell 1): 1.03729
## theta (batch 1): 0.0558496
## betas:     1.6172  -0.2049  -0.5660  -0.5744   0.9162   0.9655   0.8261   0.8149   1.4330   0.3295  -(
##
## sigma: 0.183666
## lambda (gene 1): 0.554017
## epsilon (gene 1): -0.385292
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 29760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 305.139
## delta (gene 1): 17.1827
## s (cell 1): 1.08652
```

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## nu (cell 1): 1.06084
## theta (batch 1): 0.0161107
## betas:    1.2444  -0.0574   0.3053  -0.0346   0.6747   1.1807   0.9219   0.7026   1.3843   0.1057  -
##
## sigma: 0.182629
## lambda (gene 1): 2.12614
## epsilon (gene 1): 0.110585
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 29800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 213.639
## delta (gene 1): 18.9826
## s (cell 1): 0.997188
## nu (cell 1): 1.08583
## theta (batch 1): 0.0187006
## betas:    1.1891  -0.2217   0.3692  -0.6864   0.6035   1.4442   0.7666   1.1661   1.4326   0.6939  -
##
## sigma: 0.183062
## lambda (gene 1): 0.358581
## epsilon (gene 1): 0.245738
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 29840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.493
## delta (gene 1): 13.1562
## s (cell 1): 1.15785
## nu (cell 1): 1.10929
## theta (batch 1): 0.0165094
## betas:    1.4278  -0.1554  -0.1131   0.0006   0.3231   1.4191   0.5820   1.1291   0.9520   0.9844  -
##
## sigma: 0.187222
## lambda (gene 1): 0.68499
## epsilon (gene 1): -0.129494
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
```

```
## Iteration 29880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.653
## delta (gene 1): 15.557
## s (cell 1): 0.936774
## nu (cell 1): 1.11305
## theta (batch 1): 0.018964
## betas:    1.2566  -0.1640   0.1384   0.1864   0.7927   0.9710   1.0699   0.7718   1.4761   0.5226  -(
##
## sigma: 0.186765
## lambda (gene 1): 1.15087
## epsilon (gene 1): 0.0297471
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.377
## delta (gene 1): 15.4612
## s (cell 1): 1.07497
## nu (cell 1): 1.02321
## theta (batch 1): 0.0271972
## betas:    1.7316  -0.2226   0.1100  -0.3592   0.4868   0.8107   1.0261   0.6764   1.3383   0.7179  -(
##
## sigma: 0.182739
## lambda (gene 1): 1.01813
## epsilon (gene 1): 0.0390832
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 29960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.533
## delta (gene 1): 19.3158
## s (cell 1): 0.80385
## nu (cell 1): 1.20555
## theta (batch 1): 0.0685552
## betas:    1.2791  -0.2091   0.2803  -0.1513   0.4831   1.2781   0.9311   0.8685   1.5224   0.7045  -(
##
## sigma: 0.187347
## lambda (gene 1): 1.77403
## epsilon (gene 1): 0.249717
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 30000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.402
## delta (gene 1): 13.1231
## s (cell 1): 0.980213
## nu (cell 1): 1.07688
## theta (batch 1): 0.0269161
## betas:    0.7183  -0.1243   0.2991   0.2005   1.4016   0.7818   1.2680   1.0911   1.4217   0.5778  -(
##
## sigma: 0.181566
## lambda (gene 1): 2.01527
## epsilon (gene 1): -0.133493
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 30040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 161.98
## delta (gene 1): 13.297
## s (cell 1): 1.34339
## nu (cell 1): 1.15162
## theta (batch 1): 0.0575874
## betas:    1.1576  -0.1118  -0.0999   0.2702   0.8570   0.9472   1.1152   0.8120   1.3437   0.5274  -(
##
## sigma: 0.182453
## lambda (gene 1): 0.632824
## epsilon (gene 1): -0.116529
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 30080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.481
## delta (gene 1): 13.0199
## s (cell 1): 1.11872
## nu (cell 1): 1.08864
## theta (batch 1): 0.0216778
```

```
## betas:     1.2043  -0.1365  -0.1256  -0.1025   0.6480   1.4832   0.6817   1.0680   1.2111   0.7293  -0
##
## sigma: 0.196088
## lambda (gene 1): 2.59409
## epsilon (gene 1): -0.152121
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 30120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.337
## delta (gene 1): 11.7253
## s (cell 1): 0.993112
## nu (cell 1): 1.03268
## theta (batch 1): 0.0132148
## betas:     1.3004  -0.1090   0.4157   0.4563   0.5188   1.0901   0.9505   0.8379   1.1844   0.5731  -0
##
## sigma: 0.191151
## lambda (gene 1): 0.695536
## epsilon (gene 1): -0.25094
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 30160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.911
## delta (gene 1): 22.1986
## s (cell 1): 0.921984
## nu (cell 1): 1.07597
## theta (batch 1): 0.024345
## betas:     1.0525  -0.1215  -0.5613   0.1153   0.9432   0.7608   1.5764   0.4719   1.5320   0.7743  -1
##
## sigma: 0.192137
## lambda (gene 1): 1.03242
## epsilon (gene 1): 0.398133
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 30200 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.897
## delta (gene 1): 9.85212
## s (cell 1): 1.10082
## nu (cell 1): 1.15958
## theta (batch 1): 0.0119073
## betas:    1.0544  -0.0100   0.0808  -0.5091   1.1737   1.2576   0.6723   1.0176   1.1362   0.0861  -(
##
## sigma: 0.186823
## lambda (gene 1): 1.35093
## epsilon (gene 1): -0.415953
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 30240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 320.758
## delta (gene 1): 17.8898
## s (cell 1): 1.09068
## nu (cell 1): 1.09103
## theta (batch 1): 0.0106273
## betas:    1.2009  -0.1604  -0.0687   0.0561   0.7143   0.9060   1.1441   0.9279   1.2637   0.6762  -(
##
## sigma: 0.189797
## lambda (gene 1): 1.05513
## epsilon (gene 1): 0.175579
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 30280 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.497
## delta (gene 1): 13.7655
## s (cell 1): 0.786907
## nu (cell 1): 1.0191
## theta (batch 1): 0.0394178
## betas:    1.4808  -0.1156  -0.4949   0.1341   1.1204   0.4553   1.4916   0.1826   1.5780   0.3967  -(
##
## sigma: 0.186372
## lambda (gene 1): 0.435542
## epsilon (gene 1): -0.109724
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 30320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.392
## delta (gene 1): 12.3086
## s (cell 1): 0.980693
## nu (cell 1): 1.02146
## theta (batch 1): 0.0242332
## betas:    1.0984  -0.1076  -0.5931   0.4190   0.6484   1.4023   0.6157   1.1874   1.1845   0.5010  -(
##
## sigma: 0.176322
## lambda (gene 1): 0.864838
## epsilon (gene 1): -0.214742
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 30360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.997
## delta (gene 1): 12.5001
## s (cell 1): 1.29815
## nu (cell 1): 1.10348
## theta (batch 1): 0.0111271
## betas:    0.9097  -0.1136   0.3836   0.0934   0.7416   1.4702   0.8723   1.1372   1.2572   0.7208  -(
##
## sigma: 0.183766
## lambda (gene 1): 1.97001
## epsilon (gene 1): -0.160992
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 30400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 118.266
## delta (gene 1): 12.3044
## s (cell 1): 0.851591
## nu (cell 1): 1.07017
## theta (batch 1): 0.0366673
## betas:    1.1951  -0.2857  -0.5574  -0.0286   0.6183   1.2752   0.8079   1.1770   1.6804   0.5569   (
##
```

```
## sigma: 0.176779
## lambda (gene 1): 1.1886
## epsilon (gene 1): -0.203522
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 30440 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.883
## delta (gene 1): 16.2959
## s (cell 1): 1.00446
## nu (cell 1): 1.03456
## theta (batch 1): 0.0246101
## betas:    1.9347  -0.2159  -0.1573   0.0408   0.2550   0.8795   0.6141   1.1487   0.7125   0.8422  -(
##
## sigma: 0.181875
## lambda (gene 1): 0.449549
## epsilon (gene 1): 0.0885254
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 30480 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.205
## delta (gene 1): 15.9065
## s (cell 1): 1.11575
## nu (cell 1): 1.02731
## theta (batch 1): 0.0271888
## betas:    2.0088  -0.2271  -0.4960  -0.4444   0.4343   0.8065   0.7992   0.5762   1.4592   0.3598  -(
##
## sigma: 0.179195
## lambda (gene 1): 1.5928
## epsilon (gene 1): 0.0409168
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 30520 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 156.946
```

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## delta (gene 1): 15.1459
## s (cell 1): 1.08927
## nu (cell 1): 1.05943
## theta (batch 1): 0.0125297
## betas:     1.7223   -0.0755   -0.4091   -0.1413    0.6376    0.8916    0.8763    0.5504    1.1356    0.2594   -
##
## sigma: 0.185378
## lambda (gene 1): 0.884201
## epsilon (gene 1): 0.0185835
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 30560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.84
## delta (gene 1): 15.5443
## s (cell 1): 1.12785
## nu (cell 1): 1.06166
## theta (batch 1): 0.0116982
## betas:     0.8645   -0.0778    0.5275    0.0650    0.3150    1.9124    0.6210    1.0706    1.4252    0.3515   -
##
## sigma: 0.195677
## lambda (gene 1): 2.1864
## epsilon (gene 1): 0.0314991
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 30600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.774
## delta (gene 1): 13.2751
## s (cell 1): 0.884904
## nu (cell 1): 1.0622
## theta (batch 1): 0.00960457
## betas:     1.3228   -0.2810   -0.2911   -0.6462    1.1598    0.7365    1.0074    1.2307    1.2734    1.0616   -
##
## sigma: 0.17744
## lambda (gene 1): 0.941059
## epsilon (gene 1): -0.137325
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 30640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.055
## delta (gene 1): 12.181
## s (cell 1): 1.30925
## nu (cell 1): 1.22995
## theta (batch 1): 0.00769309
## betas:    1.5109  -0.3108  -0.2945  -0.4960   0.8668   0.8086   0.8553   1.2636   1.2890   0.9250  -(
##
## sigma: 0.180823
## lambda (gene 1): 0.973585
## epsilon (gene 1): -0.208326
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 30680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.881
## delta (gene 1): 18.1351
## s (cell 1): 1.14661
## nu (cell 1): 1.15203
## theta (batch 1): 0.00848947
## betas:    0.9845  -0.2303   0.0704  -0.1693   0.7004   1.0293   1.4527   0.7272   1.7792   0.8531  -(
##
## sigma: 0.186348
## lambda (gene 1): 2.4808
## epsilon (gene 1): 0.182717
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 30720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 199.919
## delta (gene 1): 17.4017
## s (cell 1): 1.17906
## nu (cell 1): 1.13913
## theta (batch 1): 0.00640856
## betas:    1.0660  -0.1554   0.3330   0.0852   0.7492   1.3720   0.7332   1.2002   1.2649   0.6514  -(
##
## sigma: 0.187676
## lambda (gene 1): 0.990097
```

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## epsilon (gene 1): 0.160866
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 30760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.692
## delta (gene 1): 11.4527
## s (cell 1): 1.11802
## nu (cell 1): 1.04652
## theta (batch 1): 0.0368374
## betas:    1.4628  -0.0810   0.0806   0.3429   0.4864   0.8528   1.1793   0.3552   1.5761  -0.0946  -(
##
## sigma: 0.182666
## lambda (gene 1): 2.23505
## epsilon (gene 1): -0.283154
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 30800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.288
## delta (gene 1): 17.2027
## s (cell 1): 1.12737
## nu (cell 1): 1.16954
## theta (batch 1): 0.0237583
## betas:    1.5659  -0.1046  -0.5163   0.0445   0.6779   1.1996   0.6908   0.7501   1.2787   0.2844  -(
##
## sigma: 0.183577
## lambda (gene 1): 1.3096
## epsilon (gene 1): 0.129631
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 30840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.071
## delta (gene 1): 17.238
## s (cell 1): 1.16141
```

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## nu (cell 1): 1.0479
## theta (batch 1): 0.0379785
## betas:     1.7698  -0.2043  -0.4177  -0.2636   0.3765   1.1436   0.6773   0.8124   1.2641   0.6086  -(
##
## sigma: 0.188602
## lambda (gene 1): 1.39321
## epsilon (gene 1): 0.124204
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 30880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.42
## delta (gene 1): 9.51829
## s (cell 1): 1.36884
## nu (cell 1): 1.09315
## theta (batch 1): 0.0503535
## betas:     0.9767  -0.1505   0.0216   0.1360   0.8683   1.1408   1.1534   0.7028   1.8414   0.2874  -(
##
## sigma: 0.189632
## lambda (gene 1): 1.05627
## epsilon (gene 1): -0.465957
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 30920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 285.397
## delta (gene 1): 15.9436
## s (cell 1): 1.78499
## nu (cell 1): 1.11702
## theta (batch 1): 0.0524114
## betas:     1.0500  -0.0981   0.2330  -0.4038   1.3266   1.0983   0.8787   1.0381   1.2436   0.5216  -(
##
## sigma: 0.180944
## lambda (gene 1): 0.798023
## epsilon (gene 1): 0.0572821
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
```

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## Iteration 30960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.443
## delta (gene 1): 15.2878
## s (cell 1): 1.16956
## nu (cell 1): 1.10765
## theta (batch 1): 0.052337
## betas:    1.4032  -0.2361  -0.5202  -0.0514   0.7185   1.1356   0.7846   1.1568   1.2272   0.9074  -(
##
## sigma: 0.18608
## lambda (gene 1): 0.483263
## epsilon (gene 1): 0.020043
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 106.928
## delta (gene 1): 15.8005
## s (cell 1): 1.19767
## nu (cell 1): 1.0547
## theta (batch 1): 0.0248593
## betas:    1.4741  -0.1195   0.3870  -0.8326   0.8259   1.0503   0.9069   0.7842   1.2342   0.2933  -(
##
## sigma: 0.183557
## lambda (gene 1): 0.364526
## epsilon (gene 1): 0.0560741
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.098
## delta (gene 1): 17.195
## s (cell 1): 1.27603
## nu (cell 1): 1.1855
## theta (batch 1): 0.0378231
## betas:    0.7839  -0.1068   0.1438  -0.1216   0.8606   1.2830   1.0643   1.1145   1.2659   0.7715  -(
##
## sigma: 0.181468
## lambda (gene 1): 1.77361
## epsilon (gene 1): 0.134524
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 31080 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.396
## delta (gene 1): 13.224
## s (cell 1): 1.37578
## nu (cell 1): 1.05915
## theta (batch 1): 0.0496112
## betas:    0.9153  -0.0393   0.1702   0.0026   0.4804   1.8571   0.5482   1.1612   1.1359   0.4398  -(
##
## sigma: 0.188938
## lambda (gene 1): 1.28918
## epsilon (gene 1): -0.128376
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 31120 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 146.898
## delta (gene 1): 14.3413
## s (cell 1): 1.03927
## nu (cell 1): 1.06003
## theta (batch 1): 0.0123248
## betas:    1.1016  -0.1424  -0.1641  -0.1184   0.7969   1.1898   1.1553   0.8033   1.2858   1.0474  -1
##
## sigma: 0.185387
## lambda (gene 1): 0.533859
## epsilon (gene 1): -0.0697524
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 31160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 340.209
## delta (gene 1): 12.3952
## s (cell 1): 1.17771
## nu (cell 1): 1.07906
## theta (batch 1): 0.0117546
```

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## betas:     1.3708  -0.1629  -0.4119  -0.3841   0.5853   1.3158   0.7891   0.8390   1.4390   0.5166  -(
##
## sigma: 0.184738
## lambda (gene 1): 1.96907
## epsilon (gene 1): -0.195091
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 31200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 354.226
## delta (gene 1): 14.5741
## s (cell 1): 1.05298
## nu (cell 1): 1.03858
## theta (batch 1): 0.0163188
## betas:     1.5274  -0.1457  -0.1238  -0.2066   0.4794   1.1118   0.6703   0.9865   1.1265   0.4719  -(
##
## sigma: 0.187771
## lambda (gene 1): 2.56565
## epsilon (gene 1): -0.0256931
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 31240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.796
## delta (gene 1): 13.421
## s (cell 1): 1.20402
## nu (cell 1): 1.12107
## theta (batch 1): 0.0250135
## betas:     1.4826  -0.1062   0.1553   0.0345   0.6929   1.0636   0.7255   0.9286   1.1248   0.2998  -(
##
## sigma: 0.18521
## lambda (gene 1): 0.32539
## epsilon (gene 1): -0.0913463
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 31280 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.492
## delta (gene 1): 12.5403
## s (cell 1): 1.10641
## nu (cell 1): 1.06936
## theta (batch 1): 0.0501245
## betas:    1.4183  -0.1986  -0.3415  -0.4250   0.5342   1.3079   0.7151   1.1112   1.1894   0.6690  -(
##
## sigma: 0.18032
## lambda (gene 1): 0.974875
## epsilon (gene 1): -0.165655
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 31320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 166.822
## delta (gene 1): 14.8905
## s (cell 1): 1.11779
## nu (cell 1): 1.13362
## theta (batch 1): 0.0351471
## betas:    1.7049  -0.1516  -0.2009  -0.3450   0.7882   0.9018   0.7559   0.7706   1.2027   0.4081  -(
##
## sigma: 0.183981
## lambda (gene 1): 0.645147
## epsilon (gene 1): -0.026302
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 31360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.399
## delta (gene 1): 18.3407
## s (cell 1): 0.942877
## nu (cell 1): 1.16704
## theta (batch 1): 0.0429648
## betas:    0.5671  -0.0622  -0.0312   0.6086   0.8682   1.3858   1.2176   0.7439   1.8027   0.2350  -(
##
## sigma: 0.190913
## lambda (gene 1): 1.56534
## epsilon (gene 1): 0.185772
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 121.081
## delta (gene 1): 12.8505
## s (cell 1): 1.08576
## nu (cell 1): 1.12939
## theta (batch 1): 0.0146283
## betas:    1.7197  -0.3171  -0.4904  -0.2983   0.3394   1.0420   0.8888   0.8609   1.5516   0.7303  -(
##
## sigma: 0.191871
## lambda (gene 1): 1.15689
## epsilon (gene 1): -0.170652
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 287.622
## delta (gene 1): 14.7686
## s (cell 1): 1.24715
## nu (cell 1): 1.0773
## theta (batch 1): 0.0159787
## betas:    1.5696  -0.1407  -0.0993   0.0015   0.5001   1.0394   0.8835   0.8021   1.1015   0.6632  -(
##
## sigma: 0.181353
## lambda (gene 1): 1.88802
## epsilon (gene 1): -0.0120454
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.828
## delta (gene 1): 12.2411
## s (cell 1): 1.00581
## nu (cell 1): 1.02706
## theta (batch 1): 0.0109842
## betas:    1.1630  -0.1648  -0.7983   0.3914   0.9707   0.7144   1.1150   1.1120   1.1395   0.7089  -(
##
```

```
## sigma: 0.184554
## lambda (gene 1): 0.906574
## epsilon (gene 1): -0.188453
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 31520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.281
## delta (gene 1): 16.3403
## s (cell 1): 1.06258
## nu (cell 1): 1.09581
## theta (batch 1): 0.0260594
## betas:    1.0078  -0.2578  -0.7298  -0.1823   0.8570   1.3021   0.9755   1.1083   1.6895   0.7554  -(
##
## sigma: 0.178305
## lambda (gene 1): 3.98284
## epsilon (gene 1): 0.0828158
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 31560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.169
## delta (gene 1): 14.2852
## s (cell 1): 0.917087
## nu (cell 1): 1.03604
## theta (batch 1): 0.01784
## betas:    1.9917  -0.2002  -0.6760  -0.2928   0.5813   0.4587   1.2111   0.4078   1.2817   0.4306  -(
##
## sigma: 0.183986
## lambda (gene 1): 0.840883
## epsilon (gene 1): -0.0439904
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 31600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.632
```

```
## delta (gene 1): 14.8668
## s (cell 1): 1.1552
## nu (cell 1): 1.05706
## theta (batch 1): 0.011731
## betas:    0.9611  -0.0571   0.1164   0.5017   1.1247   0.8184   1.3243   0.8296   1.0802   0.7777  -(
##
## sigma: 0.172011
## lambda (gene 1): 0.895583
## epsilon (gene 1): -0.0116149
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 31640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.196
## delta (gene 1): 13.9569
## s (cell 1): 0.760742
## nu (cell 1): 1.1607
## theta (batch 1): 0.0243675
## betas:    1.2465  -0.1832   0.1708   0.3764   0.5335   0.8709   1.2791   0.8220   1.3096   0.8090  -(
##
## sigma: 0.194963
## lambda (gene 1): 0.794904
## epsilon (gene 1): -0.0684618
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 31680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.933
## delta (gene 1): 14.8108
## s (cell 1): 1.1179
## nu (cell 1): 1.0786
## theta (batch 1): 0.00866473
## betas:    1.2735  -0.1498   0.0389   0.6383  -0.1244   1.5522   0.8995   0.7560   1.5192   0.3143  -(
##
## sigma: 0.184518
## lambda (gene 1): 1.87056
## epsilon (gene 1): -0.0103995
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

```
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 273.396
## delta (gene 1): 18.0731
## s (cell 1): 1.26604
## nu (cell 1): 1.07246
## theta (batch 1): 0.0132121
## betas:    0.9737  -0.2447   0.1622   0.2229   0.5781   0.9726   1.4751   0.7850   1.8700   0.5663   (
##
## sigma: 0.181697
## lambda (gene 1): 1.2119
## epsilon (gene 1): 0.187572
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.262
## delta (gene 1): 14.4075
## s (cell 1): 1.10621
## nu (cell 1): 1.08868
## theta (batch 1): 0.00517803
## betas:    0.7596  -0.0980   0.5340   0.6304   0.8836   1.0114   1.3680   0.8275   1.5479   0.4275  -(
##
## sigma: 0.186244
## lambda (gene 1): 1.78305
## epsilon (gene 1): -0.0324492
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 122.676
## delta (gene 1): 15.1296
## s (cell 1): 1.06173
## nu (cell 1): 1.07781
## theta (batch 1): 0.00528427
## betas:    1.5334  -0.2219   0.5771  -0.5793   0.5831   1.1173   0.9132   0.8455   1.2917   0.8981  -(
##
## sigma: 0.184774
## lambda (gene 1): 1.42163
```

```
## epsilon (gene 1): -0.00412374
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 31840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 296.344
## delta (gene 1): 13.8079
## s (cell 1): 1.11435
## nu (cell 1): 1.12629
## theta (batch 1): 0.00508117
## betas:    1.1441  -0.2088   0.1811  -0.5897   0.5279   1.4785   0.7304   1.3134   1.1789   0.8735  -(
##
## sigma: 0.189669
## lambda (gene 1): 0.809702
## epsilon (gene 1): -0.0934134
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 31880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 305.403
## delta (gene 1): 12.2978
## s (cell 1): 0.910891
## nu (cell 1): 1.0093
## theta (batch 1): 0.0126502
## betas:    0.5573  -0.1307   0.7410  -0.2988   0.9342   1.5247   1.1633   1.0124   1.6814   0.6178  -(
##
## sigma: 0.193351
## lambda (gene 1): 1.19254
## epsilon (gene 1): -0.203862
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 31920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.085
## delta (gene 1): 18.7336
## s (cell 1): 1.0769
```

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## nu (cell 1): 1.18637
## theta (batch 1): 0.0215639
## betas:    1.2445  -0.1370   0.2010  -0.0704   0.6767   1.2740   0.7684   0.9642   1.3327   0.5117  -(
##
## sigma: 0.18253
## lambda (gene 1): 0.896017
## epsilon (gene 1): 0.224863
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 31960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.654
## delta (gene 1): 14.9952
## s (cell 1): 1.08172
## nu (cell 1): 1.11916
## theta (batch 1): 0.0075803
## betas:    1.4939  -0.1154  -0.4411  -0.0549   1.1194   0.6299   1.0603   0.7433   1.1215   0.6143  -(
##
## sigma: 0.189586
## lambda (gene 1): 0.862665
## epsilon (gene 1): -0.00504638
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 32000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 206.541
## delta (gene 1): 14.5867
## s (cell 1): 1.14976
## nu (cell 1): 1.0559
## theta (batch 1): 0.00699773
## betas:    1.7507  -0.2147  -0.3435  -0.2448  -0.0204   1.6170   0.3767   1.0480   1.1617   0.6413  -(
##
## sigma: 0.194376
## lambda (gene 1): 0.310367
## epsilon (gene 1): -0.0336165
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
```

```
## Iteration 32040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.203
## delta (gene 1): 15.2617
## s (cell 1): 1.0328
## nu (cell 1): 1.08326
## theta (batch 1): 0.00371544
## betas:    1.2512  -0.0289   0.0713   0.0365   0.8125   1.1679   0.8464   0.8605   0.9206   0.6778  -
##
## sigma: 0.186585
## lambda (gene 1): 1.95576
## epsilon (gene 1): 0.000461492
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 32080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 129.625
## delta (gene 1): 16.2999
## s (cell 1): 1.11308
## nu (cell 1): 1.05532
## theta (batch 1): 0.00162229
## betas:    0.9691  -0.1153  -0.2461   0.1989   0.6165   1.4381   0.8671   1.0141   1.3561   0.6503  -(
##
## sigma: 0.181508
## lambda (gene 1): 1.02252
## epsilon (gene 1): 0.0601849
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 32120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.288
## delta (gene 1): 13.0021
## s (cell 1): 1.13476
## nu (cell 1): 1.07766
## theta (batch 1): 0.00180807
## betas:    1.8028  -0.2361  -0.6196  -0.1271   0.3905   1.1537   0.5237   1.0986   1.0644   0.7363  -(
##
## sigma: 0.183619
## lambda (gene 1): 0.535343
## epsilon (gene 1): -0.122375
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 32160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 329.221
## delta (gene 1): 13.0879
## s (cell 1): 1.08657
## nu (cell 1): 1.12328
## theta (batch 1): 0.000945483
## betas:    0.9951  -0.2478  -0.4425  -0.6652   1.0385   1.4094   0.7656   1.2822   1.6183   0.6681   (
##
## sigma: 0.183225
## lambda (gene 1): 1.87596
## epsilon (gene 1): -0.147683
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 32200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.065
## delta (gene 1): 13.6368
## s (cell 1): 1.06984
## nu (cell 1): 1.04846
## theta (batch 1): 0.000452224
## betas:    1.2623  -0.1037  -0.0244  -0.4489   0.8787   1.1359   0.6255   1.2036   0.9484   0.6407  -(
##
## sigma: 0.19567
## lambda (gene 1): 0.527669
## epsilon (gene 1): -0.0958225
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 32240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 211.779
## delta (gene 1): 14.9821
## s (cell 1): 0.993092
## nu (cell 1): 1.00196
## theta (batch 1): 0.000233643
```

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## betas:    1.3447  -0.1214  -0.4921   0.4472   0.5121   0.8341   1.3053   0.4951   1.3827   0.7041  -
##
## sigma: 0.184217
## lambda (gene 1): 1.45282
## epsilon (gene 1): -0.0209087
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 32280 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.251
## delta (gene 1): 18.8676
## s (cell 1): 1.13865
## nu (cell 1): 1.09669
## theta (batch 1): 0.000262829
## betas:    0.9826  -0.0457  -0.5139  -0.0128   0.8420   1.1898   0.9954   0.8904   1.2172   0.4150  -
##
## sigma: 0.185584
## lambda (gene 1): 0.301724
## epsilon (gene 1): 0.240346
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 32320 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 247.234
## delta (gene 1): 15.8285
## s (cell 1): 1.1661
## nu (cell 1): 1.11204
## theta (batch 1): 0.000371312
## betas:    1.3083  -0.2491  -0.6011   0.4057   0.5188   0.8914   1.1538   0.9409   1.4741   0.7662  -
##
## sigma: 0.183218
## lambda (gene 1): 2.99581
## epsilon (gene 1): 0.0713139
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 32360 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.491
## delta (gene 1): 12.6809
## s (cell 1): 1.0897
## nu (cell 1): 1.11053
## theta (batch 1): 0.000304713
## betas:    0.8328  -0.1314  -0.0891   0.5344   0.9031   0.9924   1.2467   0.9597   1.4687   0.6325  -(
##
## sigma: 0.183986
## lambda (gene 1): 0.879636
## epsilon (gene 1): -0.15311
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 32400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.536
## delta (gene 1): 15.6999
## s (cell 1): 1.16694
## nu (cell 1): 1.11374
## theta (batch 1): 0.000205111
## betas:    1.1337  -0.0885  -0.1247   0.4374   0.8553   0.8838   1.1060   0.8749   1.1863   0.5878  -(
##
## sigma: 0.181668
## lambda (gene 1): 1.292
## epsilon (gene 1): 0.0455553
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 32440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.248
## delta (gene 1): 13.5999
## s (cell 1): 1.14872
## nu (cell 1): 1.11943
## theta (batch 1): 0.000232856
## betas:    0.7892  -0.1115  -0.2258   0.3604   0.4634   1.6332   0.8874   1.2052   1.1913   0.8559  -(
##
## sigma: 0.184498
## lambda (gene 1): 2.49268
## epsilon (gene 1): -0.0822865
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 32480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.391
## delta (gene 1): 18.0068
## s (cell 1): 1.03951
## nu (cell 1): 1.05129
## theta (batch 1): 0.00071629
## betas:    1.4893  -0.1389  -0.4486   0.4051   0.1579   1.1599   1.0812   0.4591   1.5495   0.4518  -(
##
## sigma: 0.184383
## lambda (gene 1): 0.415472
## epsilon (gene 1): 0.158348
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 32520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.792
## delta (gene 1): 17.1165
## s (cell 1): 1.0854
## nu (cell 1): 1.04244
## theta (batch 1): 0.00147067
## betas:    1.1910  -0.1866  -0.7159  -0.0863   1.0959   1.1610   0.7378   1.2208   1.2956   0.6375  -(
##
## sigma: 0.186924
## lambda (gene 1): 0.843521
## epsilon (gene 1): 0.133594
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 32560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 155.158
## delta (gene 1): 13.7491
## s (cell 1): 1.13722
## nu (cell 1): 1.20065
## theta (batch 1): 0.00318664
## betas:    1.2039  -0.2653   0.1171  -0.5511   0.5587   1.0997   1.2057   0.8166   1.7127   0.9138  -(
##
```

```
## sigma: 0.1908
## lambda (gene 1): 2.68699
## epsilon (gene 1): -0.108113
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 32600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 130.437
## delta (gene 1): 16.2341
## s (cell 1): 1.10273
## nu (cell 1): 1.0268
## theta (batch 1): 0.00281812
## betas:    1.2435  -0.1586   0.1668  -0.4686   0.4379   1.4893   0.8400   0.9537   1.2138   0.9511  -
##
## sigma: 0.182754
## lambda (gene 1): 0.602096
## epsilon (gene 1): 0.0780942
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 32640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.608
## delta (gene 1): 15.4102
## s (cell 1): 1.01649
## nu (cell 1): 1.00823
## theta (batch 1): 0.0104561
## betas:    1.4402  -0.1208  -0.2163  -0.0138   0.3234   1.5145   0.7422   0.6767   1.4187   0.3743  -(
##
## sigma: 0.187229
## lambda (gene 1): 0.862365
## epsilon (gene 1): 0.0139966
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 32680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.765
```

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## delta (gene 1): 11.9157
## s (cell 1): 1.13792
## nu (cell 1): 1.08558
## theta (batch 1): 0.00484077
## betas:     0.6162  -0.0438   0.6719  -0.0467   0.8389   1.3803   1.1153   0.9806   1.3821   0.5842  -(
##
## sigma: 0.181232
## lambda (gene 1): 1.01917
## epsilon (gene 1): -0.222554
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 32720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 119.36
## delta (gene 1): 18.1599
## s (cell 1): 0.980878
## nu (cell 1): 0.990822
## theta (batch 1): 0.00689324
## betas:     1.1614  -0.0353  -0.2149   0.5806   1.1882   0.7156   1.2633   0.6483   1.1324   0.4842  -(
##
## sigma: 0.185744
## lambda (gene 1): 1.62653
## epsilon (gene 1): 0.189594
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 32760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.598
## delta (gene 1): 14.6503
## s (cell 1): 0.887735
## nu (cell 1): 1.0589
## theta (batch 1): 0.00951228
## betas:     1.4681  -0.2646  -0.6808  -0.0870   0.2357   1.3416   0.8719   0.8970   1.5032   0.8423  -(
##
## sigma: 0.189566
## lambda (gene 1): 0.322398
## epsilon (gene 1): -0.0627108
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 32800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.902
## delta (gene 1): 19.3553
## s (cell 1): 1.07886
## nu (cell 1): 1.13713
## theta (batch 1): 0.00754168
## betas:    1.1847  -0.1091   0.0440  -0.4588   0.9533   1.3519   0.5492   1.2177   1.1230   0.5159  -(
##
## sigma: 0.174504
## lambda (gene 1): 0.972545
## epsilon (gene 1): 0.260014
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 32840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.573
## delta (gene 1): 16.2676
## s (cell 1): 1.14636
## nu (cell 1): 1.18357
## theta (batch 1): 0.00984266
## betas:    0.7385  -0.1328   0.4784  -0.0309   0.2539   2.2019   0.5795   1.2945   1.2924   0.9877  -(
##
## sigma: 0.182456
## lambda (gene 1): 1.2928
## epsilon (gene 1): 0.0500605
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 32880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.397
## delta (gene 1): 17.0432
## s (cell 1): 1.0542
## nu (cell 1): 0.995844
## theta (batch 1): 0.01403
## betas:    1.4841  -0.2327  -0.3883  -0.0838   0.4171   1.1964   0.9990   0.5793   1.8243   0.3382  -(
##
## sigma: 0.185982
## lambda (gene 1): 3.32885
```

```
## epsilon (gene 1): 0.116567
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 32920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 122.905
## delta (gene 1): 12.0127
## s (cell 1): 1.02612
## nu (cell 1): 1.0734
## theta (batch 1): 0.0209342
## betas:    1.7513  -0.1631  -0.0476  -0.3021   0.7595   0.6636   1.0673   0.5694   1.2553   0.4545  -(
##
## sigma: 0.186011
## lambda (gene 1): 0.71424
## epsilon (gene 1): -0.228522
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 32960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.88
## delta (gene 1): 15.0853
## s (cell 1): 1.15803
## nu (cell 1): 1.03553
## theta (batch 1): 0.0330923
## betas:    1.4055  -0.1718  -0.2025   0.3278   0.0084   1.3070   0.9392   0.7813   1.4060   0.5176  -(
##
## sigma: 0.183003
## lambda (gene 1): 0.750604
## epsilon (gene 1): 0.0207572
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.324
## delta (gene 1): 17.7342
## s (cell 1): 0.823653
```

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## nu (cell 1): 1.03207
## theta (batch 1): 0.0522724
## betas:    1.0592  -0.2396  -0.2100   0.3088   0.5129   1.0629   1.3357   0.8151   1.7296   0.7454  -(
##
## sigma: 0.179845
## lambda (gene 1): 1.94363
## epsilon (gene 1): 0.183189
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.009
## delta (gene 1): 12.8455
## s (cell 1): 0.7899
## nu (cell 1): 1.1103
## theta (batch 1): 0.0401302
## betas:    1.2044  -0.1268   0.1109  -0.0074   0.3991   1.3513   0.8942   0.8663   1.3596   0.4264  -(
##
## sigma: 0.192974
## lambda (gene 1): 2.53646
## epsilon (gene 1): -0.169475
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 286.835
## delta (gene 1): 13.2931
## s (cell 1): 1.19046
## nu (cell 1): 1.03824
## theta (batch 1): 0.0104464
## betas:    0.9625  -0.1805   0.0574  -0.0033   0.4322   1.4680   0.9408   1.1239   1.3836   0.8108  -(
##
## sigma: 0.195964
## lambda (gene 1): 2.06296
## epsilon (gene 1): -0.128097
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
```

```
## Iteration 33120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.783
## delta (gene 1): 13.5769
## s (cell 1): 1.08435
## nu (cell 1): 1.11127
## theta (batch 1): 0.00384989
## betas:    1.2115  -0.1924  -0.6649  -0.1921   0.5633   1.2466   0.9116   1.0148   1.4944   0.4181  (
##
## sigma: 0.190652
## lambda (gene 1): 1.37756
## epsilon (gene 1): -0.0998557
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 33160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.972
## delta (gene 1): 15.4823
## s (cell 1): 1.12201
## nu (cell 1): 1.0716
## theta (batch 1): 0.00251611
## betas:    1.4940  -0.2325  -0.5294  -1.0596   0.9474   1.2721   0.7405   0.8597   1.6272   0.3635  -(
##
## sigma: 0.190128
## lambda (gene 1): 1.2808
## epsilon (gene 1): 0.0218221
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 33200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.894
## delta (gene 1): 17.5766
## s (cell 1): 1.0511
## nu (cell 1): 1.03096
## theta (batch 1): 0.0068253
## betas:    1.3177  -0.1197  -0.2939  -0.1836   1.0224   1.0287   0.7403   1.1253   1.0314   0.5399  -(
##
## sigma: 0.180973
## lambda (gene 1): 1.03462
## epsilon (gene 1): 0.138711
## ----------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 150.93
## delta (gene 1): 11.4316
## s (cell 1): 1.04818
## nu (cell 1): 1.12203
## theta (batch 1): 0.0251121
## betas:    1.6303  -0.2755  -0.6505  -0.2728   0.3780   1.1052   0.7943   0.9101   1.5617   0.5049  -(
##
## sigma: 0.185773
## lambda (gene 1): 1.5885
## epsilon (gene 1): -0.267578
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.568
## delta (gene 1): 23.1175
## s (cell 1): 0.990844
## nu (cell 1): 1.02149
## theta (batch 1): 0.0210733
## betas:    1.6795  -0.1651  -0.5604  -0.0461   0.6284   0.8340   1.1262   0.2924   1.6815   0.2530  -(
##
## sigma: 0.190989
## lambda (gene 1): 1.00488
## epsilon (gene 1): 0.405017
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.501
## delta (gene 1): 10.1344
## s (cell 1): 1.11784
## nu (cell 1): 1.16507
## theta (batch 1): 0.0432588
```

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## betas:     0.8818   -0.0776   -0.2944    0.2721    0.7315    1.3815    0.8927    1.0640    1.2573    0.5164   -(
##
## sigma: 0.178525
## lambda (gene 1): 0.443311
## epsilon (gene 1): -0.369451
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 33360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 166.841
## delta (gene 1): 15.4976
## s (cell 1): 0.974602
## nu (cell 1): 1.10344
## theta (batch 1): 0.0106659
## betas:     1.4285   -0.1405   -0.1321   -0.2481    0.6427    1.1351    0.7474    1.1054    0.9191    0.8151   -(
##
## sigma: 0.191577
## lambda (gene 1): 1.24127
## epsilon (gene 1): 0.0486434
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 33400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.339
## delta (gene 1): 14.8516
## s (cell 1): 1.12298
## nu (cell 1): 1.10563
## theta (batch 1): 0.0108325
## betas:     0.7767   -0.0510   -0.4049    0.4228    0.9287    1.3525    0.8260    1.2219    1.0887    0.7206   -(
##
## sigma: 0.186719
## lambda (gene 1): 1.85021
## epsilon (gene 1): 0.000343783
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 33440 out of 40000 has been completed.
## ------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.317
## delta (gene 1): 18.6945
## s (cell 1): 1.06753
## nu (cell 1): 1.13009
## theta (batch 1): 0.00336875
## betas:    1.0643  -0.1462  -0.8958   0.0158   0.4380   1.5333   0.8252   0.9709   1.5045   0.3906  -(
##
## sigma: 0.194092
## lambda (gene 1): 1.12449
## epsilon (gene 1): 0.225451
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.383
## delta (gene 1): 18.579
## s (cell 1): 1.0689
## nu (cell 1): 1.0995
## theta (batch 1): 0.0072471
## betas:    1.2567  -0.0842  -0.2498   0.6062   0.4567   1.2462   0.8947   0.8499   1.1680   0.5196  -(
##
## sigma: 0.182709
## lambda (gene 1): 2.01311
## epsilon (gene 1): 0.201769
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 211.157
## delta (gene 1): 13.303
## s (cell 1): 0.919483
## nu (cell 1): 1.08334
## theta (batch 1): 0.00758662
## betas:    1.6856  -0.2789  -0.2528  -0.6566   0.7897   1.0487   0.4448   1.4964   0.8143   1.1409  -(
##
## sigma: 0.17901
## lambda (gene 1): 0.266585
## epsilon (gene 1): -0.126268
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.361
## delta (gene 1): 12.6952
## s (cell 1): 0.884315
## nu (cell 1): 1.03438
## theta (batch 1): 0.011988
## betas:    0.4815  -0.0115   0.2234   0.5378   0.9103   1.6350   1.0273   0.8838   1.5227   0.5738  -
##
## sigma: 0.187905
## lambda (gene 1): 1.9537
## epsilon (gene 1): -0.191363
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.893
## delta (gene 1): 18.6752
## s (cell 1): 1.32477
## nu (cell 1): 1.15705
## theta (batch 1): 0.0083289
## betas:    1.4732  -0.1512  -0.1105  -0.5686   0.6368   1.2582   0.7741   0.8112   1.3335   0.4717  -
##
## sigma: 0.183818
## lambda (gene 1): 1.70774
## epsilon (gene 1): 0.212855
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.291
## delta (gene 1): 17.0593
## s (cell 1): 1.39151
## nu (cell 1): 1.22571
## theta (batch 1): 0.0150919
## betas:    0.6485  -0.0952   0.7158  -0.1466   1.0634   1.3167   1.0670   1.1201   1.3482   0.6973  -
##
```

```
## sigma: 0.182242
## lambda (gene 1): 1.15808
## epsilon (gene 1): 0.12546
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.791
## delta (gene 1): 15.0051
## s (cell 1): 1.09033
## nu (cell 1): 1.08083
## theta (batch 1): 0.00455118
## betas:    1.3782  -0.2022  -0.4153   0.0932   0.7592   0.6325   1.4870   0.4346   1.7804   0.3918  -(
##
## sigma: 0.184537
## lambda (gene 1): 1.02859
## epsilon (gene 1): 0.00354883
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.073
## delta (gene 1): 16.2697
## s (cell 1): 1.24195
## nu (cell 1): 1.0557
## theta (batch 1): 0.00663994
## betas:    1.6810  -0.2021  -1.0996   0.2630   0.4162   0.9516   0.9967   0.6882   1.2791   0.7140  -(
##
## sigma: 0.192295
## lambda (gene 1): 2.61602
## epsilon (gene 1): 0.0778878
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.37
```

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## delta (gene 1): 11.2322
## s (cell 1): 1.05089
## nu (cell 1): 1.08157
## theta (batch 1): 0.00304
## betas:    1.1876  -0.1236  -0.1712  -0.0677   0.7474   1.1931   0.9461   0.7641   1.5929   0.2504  -0
##
## sigma: 0.196664
## lambda (gene 1): 1.15118
## epsilon (gene 1): -0.292802
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.313
## delta (gene 1): 13.9056
## s (cell 1): 1.107
## nu (cell 1): 1.04614
## theta (batch 1): 0.00531314
## betas:    1.4687  -0.2142  -0.7051  -0.3032   0.7009   1.2903   0.7197   1.0387   1.1992   0.8647  -0
##
## sigma: 0.192834
## lambda (gene 1): 1.34387
## epsilon (gene 1): -0.0935337
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 33840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.668
## delta (gene 1): 14.2396
## s (cell 1): 1.08952
## nu (cell 1): 1.14281
## theta (batch 1): 0.00414491
## betas:    1.4588  -0.1369   0.0908  -0.2034   0.3490   1.2876   0.7572   0.9419   1.0214   0.8162  -0
##
## sigma: 0.177318
## lambda (gene 1): 0.562907
## epsilon (gene 1): -0.0669877
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.507
## delta (gene 1): 17.088
## s (cell 1): 1.1895
## nu (cell 1): 0.962455
## theta (batch 1): 0.0203279
## betas:    1.0557  -0.1032  -0.4129   0.6989   0.4183   1.2837   1.0835   0.7647   1.4764   0.3640  -(
##
## sigma: 0.193741
## lambda (gene 1): 2.74736
## epsilon (gene 1): 0.139168
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.273
## delta (gene 1): 14.3202
## s (cell 1): 1.13551
## nu (cell 1): 1.13907
## theta (batch 1): 0.0178497
## betas:    1.4549  -0.1637  -0.2458  -0.2309   0.8221   1.0874   0.5622   1.2734   0.9787   0.7147  -(
##
## sigma: 0.184316
## lambda (gene 1): 0.799922
## epsilon (gene 1): -0.0456096
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 33960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.292
## delta (gene 1): 13.8758
## s (cell 1): 1.22822
## nu (cell 1): 1.10218
## theta (batch 1): 0.00429998
## betas:    0.9995  -0.1953   0.2558  -0.1975   0.5826   1.1211   1.2274   0.8540   1.6330   0.7341  -(
##
## sigma: 0.178604
## lambda (gene 1): 0.28707
```

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## epsilon (gene 1): -0.0733413
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 149.878
## delta (gene 1): 11.232
## s (cell 1): 1.00078
## nu (cell 1): 1.02941
## theta (batch 1): 0.00633628
## betas:    1.0580  -0.0714  -0.3099  -0.2022   1.3080   1.2274   0.5903   1.3696   0.7572   0.8711  -(
##
## sigma: 0.182908
## lambda (gene 1): 1.44996
## epsilon (gene 1): -0.299549
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.342
## delta (gene 1): 13.9546
## s (cell 1): 0.998886
## nu (cell 1): 1.10121
## theta (batch 1): 0.0113084
## betas:    1.2413  -0.1691  -0.5874  -0.0754   0.5862   1.2375   0.8955   1.0000   1.2491   0.8133  -(
##
## sigma: 0.184419
## lambda (gene 1): 0.948139
## epsilon (gene 1): -0.0648134
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.71
## delta (gene 1): 16.8912
## s (cell 1): 1.29933
```

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## nu (cell 1): 1.00176
## theta (batch 1): 0.0150585
## betas:    1.3698  -0.1652  -0.8264  -0.0219   0.5095   1.3009   0.8372   0.9372   1.2936   0.5862  -(
##
## sigma: 0.183724
## lambda (gene 1): 1.47293
## epsilon (gene 1): 0.114318
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.868
## delta (gene 1): 16.9036
## s (cell 1): 0.783448
## nu (cell 1): 1.08972
## theta (batch 1): 0.0340144
## betas:    1.2349  -0.0523  -0.3973  -0.2308   1.2807   0.7177   1.2024   0.6048   1.2099   0.5280  -
##
## sigma: 0.187368
## lambda (gene 1): 0.814012
## epsilon (gene 1): 0.10711
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 127.163
## delta (gene 1): 17.6111
## s (cell 1): 1.68437
## nu (cell 1): 1.16745
## theta (batch 1): 0.044486
## betas:    1.1187  -0.1421   0.2116   0.1358   0.4579   1.3022   0.8431   1.1077   1.2379   0.7398  -(
##
## sigma: 0.186575
## lambda (gene 1): 0.406936
## epsilon (gene 1): 0.163486
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
```

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## Iteration 34200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 399.334
## delta (gene 1): 17.4726
## s (cell 1): 1.14087
## nu (cell 1): 1.12013
## theta (batch 1): 0.0161834
## betas:    2.0431  -0.2573   0.0511  -0.1931   0.0295   0.9738   0.6005   1.1504   0.7908   0.7643  -(
##
## sigma: 0.182633
## lambda (gene 1): 1.18673
## epsilon (gene 1): 0.176928
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 34240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 342.11
## delta (gene 1): 14.4332
## s (cell 1): 1.03779
## nu (cell 1): 1.07327
## theta (batch 1): 0.0370796
## betas:    1.8866  -0.2014  -0.6905  -0.2671   0.5395   0.8147   0.8524   0.8035   0.9057   1.0015  -1
##
## sigma: 0.185115
## lambda (gene 1): 0.796148
## epsilon (gene 1): -0.0592582
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 34280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.138
## delta (gene 1): 14.2259
## s (cell 1): 1.07323
## nu (cell 1): 1.09989
## theta (batch 1): 0.0198034
## betas:    1.7068  -0.1505   0.1408  -0.3996   0.3115   1.4081   0.3561   1.0727   1.0124   0.5713  -(
##
## sigma: 0.184815
## lambda (gene 1): 0.301575
## epsilon (gene 1): -0.0620951
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 34320 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.678
## delta (gene 1): 11.7941
## s (cell 1): 0.965971
## nu (cell 1): 1.06543
## theta (batch 1): 0.0120529
## betas:    1.1050  -0.0918  -0.7086   0.6016   0.5667   1.5276   0.5246   1.2548   1.0555   0.6632  -(
##
## sigma: 0.177888
## lambda (gene 1): 1.20165
## epsilon (gene 1): -0.243716
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 34360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.431
## delta (gene 1): 14.8934
## s (cell 1): 1.01048
## nu (cell 1): 1.09956
## theta (batch 1): 0.0157652
## betas:    1.5941  -0.1290  -0.9572  -0.3927   1.0329   0.8731   0.9296   0.5520   1.4421   0.2657  -(
##
## sigma: 0.197476
## lambda (gene 1): 2.31656
## epsilon (gene 1): -0.0170142
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 34400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 298.586
## delta (gene 1): 17.5257
## s (cell 1): 1.00979
## nu (cell 1): 1.09619
## theta (batch 1): 0.00677924
```

```
## betas:    1.3532  -0.1432  -1.1025   0.1673   0.7000   1.2499   0.7808   0.8898   1.2457   0.6655  -(
##
## sigma: 0.18896
## lambda (gene 1): 1.3624
## epsilon (gene 1): 0.139804
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 34440 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.876
## delta (gene 1): 13.8126
## s (cell 1): 1.20576
## nu (cell 1): 1.18417
## theta (batch 1): 0.00267031
## betas:    1.4712  -0.0839  -0.6238  -0.1081   0.5444   1.4741   0.5856   0.7490   1.3591   0.0581  -(
##
## sigma: 0.179314
## lambda (gene 1): 0.41846
## epsilon (gene 1): -0.0913148
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 34480 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 141.896
## delta (gene 1): 13.2122
## s (cell 1): 0.874879
## nu (cell 1): 0.985038
## theta (batch 1): 0.00620301
## betas:    1.2100  -0.0935  -0.5538   0.1889   0.7054   1.0881   1.0292   0.8008   1.2154   0.5957  -(
##
## sigma: 0.18623
## lambda (gene 1): 0.828698
## epsilon (gene 1): -0.139856
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 34520 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.014
## delta (gene 1): 17.3508
## s (cell 1): 1.0542
## nu (cell 1): 1.12486
## theta (batch 1): 0.0026109
## betas:    1.6167  -0.1765  -0.9476  -1.1365   1.0198   1.1240   0.6475   0.9130   1.2269   0.5305  -(
##
## sigma: 0.187041
## lambda (gene 1): 1.3038
## epsilon (gene 1): 0.140832
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 34560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.787
## delta (gene 1): 16.2231
## s (cell 1): 1.12594
## nu (cell 1): 1.17278
## theta (batch 1): 0.00222006
## betas:    0.6984  -0.1025  -0.6957  -0.0057   1.1018   1.3319   1.1256   1.0208   1.4627   0.5362  -(
##
## sigma: 0.180378
## lambda (gene 1): 0.701799
## epsilon (gene 1): 0.0799178
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 34600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 272.029
## delta (gene 1): 16.3414
## s (cell 1): 1.01096
## nu (cell 1): 1.06825
## theta (batch 1): 0.00246379
## betas:    0.3611  -0.1300  -0.7603   0.1539   1.0778   1.5368   1.1442   1.0948   1.8346   0.5229  -(
##
## sigma: 0.177764
## lambda (gene 1): 1.29933
## epsilon (gene 1): 0.080538
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 34640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.115
## delta (gene 1): 15.1413
## s (cell 1): 1.14447
## nu (cell 1): 1.12286
## theta (batch 1): 0.00994942
## betas:     1.0215    0.0070    0.4138   -0.0909    1.2384    0.7568    1.3182    0.5449    1.3154    0.3012   -
##
## sigma: 0.186472
## lambda (gene 1): 2.02738
## epsilon (gene 1): 0.0100562
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 34680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.235
## delta (gene 1): 15.4172
## s (cell 1): 1.19116
## nu (cell 1): 1.07496
## theta (batch 1): 0.00705346
## betas:     1.4824   -0.0952   -0.1371   -0.7105    1.2272    1.0058    0.7569    0.7162    1.3233    0.2652   -
##
## sigma: 0.181619
## lambda (gene 1): 1.50377
## epsilon (gene 1): 0.00648281
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 34720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.502
## delta (gene 1): 15.2866
## s (cell 1): 0.998002
## nu (cell 1): 1.04163
## theta (batch 1): 0.0116085
## betas:     0.8788   -0.0426   -0.0480   -0.3517    1.3017    1.0722    1.0810    0.8068    1.4535    0.2653   -
##
```

```
## sigma: 0.186926
## lambda (gene 1): 0.50778
## epsilon (gene 1): 0.0334643
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.295
## delta (gene 1): 13.9457
## s (cell 1): 1.34839
## nu (cell 1): 1.07902
## theta (batch 1): 0.0063063
## betas:    1.1479  -0.0862  -0.6550   0.2000   0.8344   1.1517   0.9417   0.9152   1.0851   0.8815  -
##
## sigma: 0.190138
## lambda (gene 1): 0.305974
## epsilon (gene 1): -0.0911074
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 139.59
## delta (gene 1): 16.3264
## s (cell 1): 1.06072
## nu (cell 1): 1.07016
## theta (batch 1): 0.00602405
## betas:    1.1988  -0.1712  -0.3696  -0.0875   1.0629   0.5951   1.3891   0.8975   1.1251   1.0870  -0
##
## sigma: 0.18684
## lambda (gene 1): 1.89459
## epsilon (gene 1): 0.0806361
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.286
```

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## delta (gene 1): 12.9707
## s (cell 1): 1.11029
## nu (cell 1): 1.04191
## theta (batch 1): 0.0150655
## betas:    1.5916  -0.2553   0.0971  -0.4537   0.5203   0.8637   1.1961   0.5027   1.8377   0.4029  -(
##
## sigma: 0.184315
## lambda (gene 1): 0.621488
## epsilon (gene 1): -0.166021
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 34880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 147.865
## delta (gene 1): 17.5573
## s (cell 1): 0.886483
## nu (cell 1): 1.09641
## theta (batch 1): 0.0299814
## betas:    1.5502  -0.2093  -0.0231   0.0717   0.3554   0.9838   0.9405   0.9105   1.2149   0.6991  -(
##
## sigma: 0.185814
## lambda (gene 1): 2.94284
## epsilon (gene 1): 0.147072
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 34920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 113.631
## delta (gene 1): 14.6076
## s (cell 1): 1.03284
## nu (cell 1): 1.07221
## theta (batch 1): 0.0154017
## betas:    1.6274  -0.1463  -0.4475  -0.0106   0.6419   1.0732   0.4665   1.2813   0.6437   0.9271  -(
##
## sigma: 0.189309
## lambda (gene 1): 0.644877
## epsilon (gene 1): -0.0327275
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 34960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.985
## delta (gene 1): 19.3079
## s (cell 1): 1.06528
## nu (cell 1): 1.10447
## theta (batch 1): 0.00722277
## betas:    1.5868  -0.1226   0.0446  -0.9205   1.1233   1.0597   0.6425   0.8636   1.1128   0.4851  -(
##
## sigma: 0.185239
## lambda (gene 1): 0.281083
## epsilon (gene 1): 0.225634
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 35000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.109
## delta (gene 1): 15.7832
## s (cell 1): 1.05967
## nu (cell 1): 1.1558
## theta (batch 1): 0.0262849
## betas:    1.2628  -0.1659   0.4034   0.1687   0.3629   1.2151   1.1444   0.6822   1.4844   0.6013  -(
##
## sigma: 0.178178
## lambda (gene 1): 1.50582
## epsilon (gene 1): 0.0435878
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 35040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.662
## delta (gene 1): 13.292
## s (cell 1): 0.994803
## nu (cell 1): 1.08362
## theta (batch 1): 0.041386
## betas:    1.0835  -0.0885   0.2575   0.2596   0.5557   1.4817   0.7039   1.1162   1.0575   0.7620  -(
##
## sigma: 0.184077
## lambda (gene 1): 2.11174
```

```
## epsilon (gene 1): -0.135615
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 35080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 332.065
## delta (gene 1): 12.4917
## s (cell 1): 1.29357
## nu (cell 1): 1.22164
## theta (batch 1): 0.0150096
## betas:    1.3746  -0.2389   0.7692  -0.6496   0.5627   0.9542   1.2120   0.6573   1.8356   0.4030  -(
##
## sigma: 0.189094
## lambda (gene 1): 1.32373
## epsilon (gene 1): -0.192794
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 35120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.389
## delta (gene 1): 10.6265
## s (cell 1): 1.08793
## nu (cell 1): 1.08671
## theta (batch 1): 0.0169249
## betas:    1.8662  -0.1553  -0.6699   0.3629  -0.0950   1.4602   0.4342   0.8836   1.0679   0.3716  -(
##
## sigma: 0.183395
## lambda (gene 1): 1.97198
## epsilon (gene 1): -0.340877
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 35160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 130.126
## delta (gene 1): 14.3851
## s (cell 1): 1.12136
```

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## nu (cell 1): 1.14371
## theta (batch 1): 0.0238889
## betas:    1.3715  -0.1975   0.0496  -0.6825   0.9391   1.3061   0.5685   1.1102   1.3689   0.5517  -(
##
## sigma: 0.185834
## lambda (gene 1): 0.572771
## epsilon (gene 1): -0.0605708
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 35200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.166
## delta (gene 1): 16.7251
## s (cell 1): 1.18678
## nu (cell 1): 1.20645
## theta (batch 1): 0.00409813
## betas:    1.1123  -0.2187  -0.0722  -0.1885   0.8989   1.1312   1.0898   0.8193   1.8102   0.4370  (
##
## sigma: 0.191618
## lambda (gene 1): 1.13935
## epsilon (gene 1): 0.102723
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 35240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.321
## delta (gene 1): 13.3804
## s (cell 1): 1.28961
## nu (cell 1): 1.24143
## theta (batch 1): 0.00751553
## betas:    1.4801  -0.2524   0.1366  -0.1795   0.4435   1.1466   0.8263   0.9600   1.4894   0.7484  -(
##
## sigma: 0.178355
## lambda (gene 1): 1.61803
## epsilon (gene 1): -0.131735
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
```

```
## Iteration 35280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.569
## delta (gene 1): 9.95467
## s (cell 1): 1.21645
## nu (cell 1): 1.10605
## theta (batch 1): 0.0402871
## betas:    1.6189  -0.1669  -0.0214   0.2085   0.7686   0.6636   0.9644   0.8474   1.1364   0.6607  -(
##
## sigma: 0.190658
## lambda (gene 1): 0.620659
## epsilon (gene 1): -0.421917
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 35320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 140.611
## delta (gene 1): 12.4607
## s (cell 1): 1.13532
## nu (cell 1): 1.13383
## theta (batch 1): 0.0539161
## betas:    1.0829  -0.0662  -0.2902   0.6527   0.7671   1.1299   0.9103   1.0107   1.1210   0.4418  -(
##
## sigma: 0.183477
## lambda (gene 1): 0.99625
## epsilon (gene 1): -0.187902
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 35360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.269
## delta (gene 1): 16.4322
## s (cell 1): 1.08457
## nu (cell 1): 1.0395
## theta (batch 1): 0.0221192
## betas:    1.3578  -0.1773  -0.3180  -0.7814   0.9553   1.2420   0.8347   0.7173   1.7253   0.2289  -(
##
## sigma: 0.186545
## lambda (gene 1): 0.965715
## epsilon (gene 1): 0.0800375
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.558
## delta (gene 1): 18.7845
## s (cell 1): 1.05148
## nu (cell 1): 1.07618
## theta (batch 1): 0.0132861
## betas:    0.8191  -0.1326   0.1527  -0.1611   1.1731   1.2241   0.9963   1.0486   1.5498   0.4665  -(
##
## sigma: 0.185023
## lambda (gene 1): 0.565538
## epsilon (gene 1): 0.226337
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.523
## delta (gene 1): 15.2823
## s (cell 1): 1.04034
## nu (cell 1): 1.11222
## theta (batch 1): 0.00208158
## betas:    0.9391  -0.1685  -1.2311  -0.1013   0.8159   1.3585   1.0464   1.0789   1.3495   0.8066  -(
##
## sigma: 0.190252
## lambda (gene 1): 0.213074
## epsilon (gene 1): 0.0270989
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.579
## delta (gene 1): 12.9643
## s (cell 1): 1.08456
## nu (cell 1): 1.15654
## theta (batch 1): 0.000764475
```

```
## betas:     1.0224  -0.1024   0.2272  -0.5149   1.2482   1.0171   1.2153   0.7886   1.2879   0.7798  -(
##
## sigma: 0.185567
## lambda (gene 1): 1.19352
## epsilon (gene 1): -0.153043
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.473
## delta (gene 1): 17.1674
## s (cell 1): 1.06197
## nu (cell 1): 1.08664
## theta (batch 1): 0.000707908
## betas:     1.0230  -0.2267  -0.3350  -0.7806   1.3359   0.9773   1.2239   0.8396   1.8153   0.5616  -(
##
## sigma: 0.195457
## lambda (gene 1): 1.19895
## epsilon (gene 1): 0.123435
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.46
## delta (gene 1): 14.9378
## s (cell 1): 1.0919
## nu (cell 1): 1.08464
## theta (batch 1): 0.00117938
## betas:     1.3738  -0.2793  -0.6466  -0.0772   0.5422   1.3995   0.3288   1.6625   1.0453   1.0814  -(
##
## sigma: 0.183659
## lambda (gene 1): 0.402456
## epsilon (gene 1): -0.00633263
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35600 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.507
## delta (gene 1): 12.2351
## s (cell 1): 1.2756
## nu (cell 1): 1.10305
## theta (batch 1): 0.0181503
## betas:    0.7192  -0.1009   0.3657  -0.1373   0.7933   1.5196   1.0935   0.8269   1.6258   0.6460  -(
##
## sigma: 0.183313
## lambda (gene 1): 1.07867
## epsilon (gene 1): -0.217571
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 242.759
## delta (gene 1): 11.2383
## s (cell 1): 1.21211
## nu (cell 1): 1.06154
## theta (batch 1): 0.0219782
## betas:    1.0861  -0.1958   0.0279  -0.6949   0.9543   1.2291   0.9564   0.9645   1.5929   0.6452  -(
##
## sigma: 0.194846
## lambda (gene 1): 1.09827
## epsilon (gene 1): -0.283012
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 109.09
## delta (gene 1): 14.3093
## s (cell 1): 1.0112
## nu (cell 1): 1.0646
## theta (batch 1): 0.046491
## betas:    1.1595  -0.0255  -0.5835   0.8374   0.7614   0.7110   1.3832   0.5216   1.1620   0.5705  -
##
## sigma: 0.183746
## lambda (gene 1): 1.42235
## epsilon (gene 1): -0.0574906
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 35720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.583
## delta (gene 1): 13.7438
## s (cell 1): 1.5202
## nu (cell 1): 1.04046
## theta (batch 1): 0.0301829
## betas:    1.1268  -0.1278   0.3313  -0.1713   0.6686   1.2869   0.9010   0.9315   1.2783   0.7566  -(
##
## sigma: 0.185296
## lambda (gene 1): 0.903812
## epsilon (gene 1): -0.101092
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 35760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.261
## delta (gene 1): 14.078
## s (cell 1): 0.901953
## nu (cell 1): 1.09538
## theta (batch 1): 0.0272359
## betas:    1.6614  -0.1783  -0.2715  -0.2508   0.6253   0.8234   0.8677   1.0316   0.7833   1.0014  -(
##
## sigma: 0.18086
## lambda (gene 1): 0.926143
## epsilon (gene 1): -0.0740821
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 35800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.911
## delta (gene 1): 17.7631
## s (cell 1): 1.03364
## nu (cell 1): 1.08574
## theta (batch 1): 0.0201535
## betas:    1.4649  -0.2140  -0.4708  -0.0398  -0.1237   1.5670   0.8328   0.7801   1.5412   0.4728  -(
##
```

```
## sigma: 0.182202
## lambda (gene 1): 1.18334
## epsilon (gene 1): 0.166671
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------------
## Iteration 35840 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 127.393
## delta (gene 1): 12.756
## s (cell 1): 1.20216
## nu (cell 1): 1.15806
## theta (batch 1): 0.0623823
## betas:    1.4652  -0.0820  -0.4922   0.3036   0.7775   0.8257   0.7600   1.2262   0.5004   0.9447  -
##
## sigma: 0.181231
## lambda (gene 1): 1.31049
## epsilon (gene 1): -0.157938
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------------
## Iteration 35880 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.564
## delta (gene 1): 12.4803
## s (cell 1): 0.920127
## nu (cell 1): 1.03585
## theta (batch 1): 0.121319
## betas:    1.2647  -0.1054  -0.2571   0.2380   0.8529   0.8705   0.9693   0.9630   0.9436   0.9423  -(
##
## sigma: 0.188177
## lambda (gene 1): 0.91655
## epsilon (gene 1): -0.204529
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -----------------------------------------------------------
## Iteration 35920 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.538
```

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## delta (gene 1): 14.9712
## s (cell 1): 1.25109
## nu (cell 1): 1.14779
## theta (batch 1): 0.0444844
## betas:    1.6794  -0.2517  -0.5499   0.0190   0.1111   1.2432   0.7394   1.0160   1.1248   1.0466  -(
##
## sigma: 0.186902
## lambda (gene 1): 1.24094
## epsilon (gene 1): -0.0181204
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 35960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.934
## delta (gene 1): 21.2499
## s (cell 1): 1.74125
## nu (cell 1): 1.10931
## theta (batch 1): 0.0351206
## betas:    1.1533  -0.2095  -0.1073  -0.2051   0.9331   1.0586   1.2813   0.6972   1.6421   0.7341  -(
##
## sigma: 0.180921
## lambda (gene 1): 1.69556
## epsilon (gene 1): 0.327721
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 36000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 140.102
## delta (gene 1): 17.7415
## s (cell 1): 1.04039
## nu (cell 1): 1.07052
## theta (batch 1): 0.0253129
## betas:    1.4256  -0.0470  -0.4031  -0.1794   1.4344   0.3034   1.3711   0.4076   1.2479   0.2766  -(
##
## sigma: 0.180107
## lambda (gene 1): 1.4155
## epsilon (gene 1): 0.159004
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 36040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 327.471
## delta (gene 1): 18.8503
## s (cell 1): 0.740081
## nu (cell 1): 1.06549
## theta (batch 1): 0.0393251
## betas:    1.0940  -0.0736   0.4095  -0.0640   0.6211   1.3061   1.0406   0.6634   1.4735   0.4064  -(
##
## sigma: 0.184428
## lambda (gene 1): 0.805061
## epsilon (gene 1): 0.214976
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 36080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.807
## delta (gene 1): 12.3861
## s (cell 1): 1.2195
## nu (cell 1): 1.14791
## theta (batch 1): 0.00272733
## betas:    1.5468  -0.2001  -0.7722  -0.3086   0.5344   1.1547   0.7600   0.9880   1.1084   0.9392  -(
##
## sigma: 0.183171
## lambda (gene 1): 0.777331
## epsilon (gene 1): -0.198917
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 36120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 286.986
## delta (gene 1): 14.0833
## s (cell 1): 0.965727
## nu (cell 1): 0.988764
## theta (batch 1): 0.0036679
## betas:    1.1647  -0.2262  -0.4850   0.5869   0.3142   0.9566   1.3521   0.8651   1.4246   0.9448  -(
##
## sigma: 0.186986
## lambda (gene 1): 1.56757
```

```
## epsilon (gene 1): -0.0872835
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 36160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.969
## delta (gene 1): 16.8902
## s (cell 1): 1.27032
## nu (cell 1): 1.07179
## theta (batch 1): 0.00545043
## betas:    1.0772  -0.1306  -0.1524   0.7408  -0.0751   1.5055   1.1397   0.7510   1.3513   0.8320  -(
##
## sigma: 0.182215
## lambda (gene 1): 0.990938
## epsilon (gene 1): 0.113542
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 36200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.262
## delta (gene 1): 20.3871
## s (cell 1): 1.18749
## nu (cell 1): 1.06092
## theta (batch 1): 0.0121942
## betas:    1.9954  -0.2509   0.2251  -0.2056   0.2161   0.9755   0.4593   1.3360   0.5753   1.1031  -(
##
## sigma: 0.185715
## lambda (gene 1): 1.19581
## epsilon (gene 1): 0.314439
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 36240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 285.026
## delta (gene 1): 16.5171
## s (cell 1): 0.791787
```

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## nu (cell 1): 0.999287
## theta (batch 1): 0.0522174
## betas:    0.7993  -0.1198  -0.0734   0.4104   0.8957   1.2301   0.9612   1.3373   0.9774   1.1327  -(
##
## sigma: 0.188706
## lambda (gene 1): 4.13684
## epsilon (gene 1): 0.0986543
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 36280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 199.689
## delta (gene 1): 12.4181
## s (cell 1): 0.956562
## nu (cell 1): 1.10851
## theta (batch 1): 0.0258567
## betas:    1.0893  -0.1521  -0.5477   0.2525   0.7226   1.1184   0.9903   1.0681   1.2713   0.6963  -(
##
## sigma: 0.194129
## lambda (gene 1): 0.943443
## epsilon (gene 1): -0.182358
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 36320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 327.823
## delta (gene 1): 15.8057
## s (cell 1): 1.59684
## nu (cell 1): 1.23077
## theta (batch 1): 0.0323783
## betas:    1.3212  -0.2745   0.1401  -0.3733   0.5959   1.1128   1.0143   0.9933   1.4794   1.0451  -(
##
## sigma: 0.180459
## lambda (gene 1): 0.555561
## epsilon (gene 1): 0.0404092
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
```

```
## Iteration 36360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.011
## delta (gene 1): 14.6308
## s (cell 1): 1.19559
## nu (cell 1): 1.07448
## theta (batch 1): 0.0230846
## betas:    1.4177  -0.1622  -0.5645   0.4006   0.3741   1.2192   0.9303   0.7180   1.3767   0.7144  -(
##
## sigma: 0.179755
## lambda (gene 1): 1.74661
## epsilon (gene 1): -0.0459424
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 36400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 165.945
## delta (gene 1): 15.9765
## s (cell 1): 1.31367
## nu (cell 1): 1.04929
## theta (batch 1): 0.0654772
## betas:    1.3372  -0.1363   0.0286   0.0221   0.8760   0.9441   0.9979   0.8811   1.0764   0.9839  -1
##
## sigma: 0.180813
## lambda (gene 1): 0.399557
## epsilon (gene 1): 0.0452673
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 36440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.57
## delta (gene 1): 13.017
## s (cell 1): 1.29618
## nu (cell 1): 1.11577
## theta (batch 1): 0.0198831
## betas:    0.7936  -0.1508  -0.4473  -0.0506   0.9961   1.2127   1.0561   1.2540   1.1240   1.1658  -(
##
## sigma: 0.186422
## lambda (gene 1): 0.972892
## epsilon (gene 1): -0.171
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 36480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.281
## delta (gene 1): 20.8482
## s (cell 1): 1.01494
## nu (cell 1): 1.09997
## theta (batch 1): 0.00923986
## betas:    1.4520  -0.1155  -0.6845   0.3117   0.2919   1.1969   0.8308   0.7935   1.2171   0.4432  -(
##
## sigma: 0.189022
## lambda (gene 1): 1.64719
## epsilon (gene 1): 0.324638
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 36520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.422
## delta (gene 1): 13.814
## s (cell 1): 1.20683
## nu (cell 1): 1.12236
## theta (batch 1): 0.0254131
## betas:    1.0229  -0.1506   0.5232   0.1051   0.3366   1.4507   0.9306   1.0187   1.3326   0.8106  -(
##
## sigma: 0.182512
## lambda (gene 1): 1.237
## epsilon (gene 1): -0.103376
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 36560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.536
## delta (gene 1): 12.7347
## s (cell 1): 0.846826
## nu (cell 1): 1.09281
## theta (batch 1): 0.0379021
```

```
## betas:     1.0230  -0.0774    0.3770    0.1157    0.7276    1.3566    0.7229    1.1767    1.0796    0.6797  -(
##
## sigma: 0.194791
## lambda (gene 1): 1.11578
## epsilon (gene 1): -0.161705
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 36600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.017
## delta (gene 1): 15.4223
## s (cell 1): 0.954291
## nu (cell 1): 1.08725
## theta (batch 1): 0.0113559
## betas:     1.7681    0.0106    0.1724    0.3269    0.2275    1.1164    0.8050    0.3538    1.0028    0.1193  -
##
## sigma: 0.1845
## lambda (gene 1): 1.30481
## epsilon (gene 1): 0.00962267
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 36640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.954
## delta (gene 1): 10.9711
## s (cell 1): 0.97129
## nu (cell 1): 1.11921
## theta (batch 1): 0.0074957
## betas:     1.7044  -0.1837   -0.1189   -0.4809    0.4930    1.0938    0.6355    0.9752    1.0683    0.7146  -(
##
## sigma: 0.185998
## lambda (gene 1): 1.28961
## epsilon (gene 1): -0.315494
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 36680 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 150.571
## delta (gene 1): 12.3106
## s (cell 1): 0.916934
## nu (cell 1): 1.1137
## theta (batch 1): 0.0219283
## betas:    1.7344  -0.2030   0.3660  -0.6671   0.5777   1.2931   0.4816   1.0118   1.0785   0.7553  -(
##
## sigma: 0.188957
## lambda (gene 1): 0.678749
## epsilon (gene 1): -0.230562
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 36720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.279
## delta (gene 1): 13.4255
## s (cell 1): 0.930822
## nu (cell 1): 1.07682
## theta (batch 1): 0.0265132
## betas:    1.2117  -0.1190   0.5943   0.3495   0.6056   0.9817   1.2057   0.5798   1.5262   0.4709  -(
##
## sigma: 0.174001
## lambda (gene 1): 0.568573
## epsilon (gene 1): -0.13872
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 36760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 142.445
## delta (gene 1): 16.5812
## s (cell 1): 1.20605
## nu (cell 1): 1.03097
## theta (batch 1): 0.00663571
## betas:    1.3599  -0.1309   0.1098   0.3123   0.3404   1.2202   0.8193   0.9499   1.2527   0.2958  -(
##
## sigma: 0.188817
## lambda (gene 1): 1.1967
## epsilon (gene 1): 0.125039
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 36800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.024
## delta (gene 1): 9.00464
## s (cell 1): 1.06831
## nu (cell 1): 1.09493
## theta (batch 1): 0.00774281
## betas:    1.1029  -0.0339  -0.3760   0.1826   0.7012   1.1839   1.3243   0.3060   1.5673   0.3171  -
##
## sigma: 0.187903
## lambda (gene 1): 0.223041
## epsilon (gene 1): -0.521115
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 36840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.972
## delta (gene 1): 13.7555
## s (cell 1): 1.03202
## nu (cell 1): 1.10499
## theta (batch 1): 0.0308844
## betas:    0.3756  -0.1034  -0.4859   0.7790   1.0091   1.6235   0.9098   1.3591   1.5200   0.6608  -
##
## sigma: 0.184309
## lambda (gene 1): 1.42657
## epsilon (gene 1): -0.105888
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 36880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.606
## delta (gene 1): 10.7535
## s (cell 1): 0.786578
## nu (cell 1): 0.972303
## theta (batch 1): 0.0442792
## betas:    1.3792  -0.1744  -0.6089  -0.1141   0.9302   0.7349   1.0205   1.1195   0.8023   1.3874  -
##
```

```
## sigma: 0.184533
## lambda (gene 1): 0.658775
## epsilon (gene 1): -0.359111
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 36920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.919
## delta (gene 1): 12.9215
## s (cell 1): 0.936234
## nu (cell 1): 1.16323
## theta (batch 1): 0.0138891
## betas:    1.8076  -0.2059  -0.7516  -0.4195   0.6657   1.0117   0.6341   0.9389   1.1331   0.6133  -(
##
## sigma: 0.183729
## lambda (gene 1): 1.2347
## epsilon (gene 1): -0.161827
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 36960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 193.137
## delta (gene 1): 16.547
## s (cell 1): 0.906599
## nu (cell 1): 1.1613
## theta (batch 1): 0.019375
## betas:    0.6275  -0.1389   0.2721  -0.0060   0.4174   1.6720   1.1844   0.9280   1.6367   0.7595  -(
##
## sigma: 0.186143
## lambda (gene 1): 1.45224
## epsilon (gene 1): 0.0833778
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 37000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.06
```

```
## delta (gene 1): 13.2788
## s (cell 1): 1.0927
## nu (cell 1): 1.12865
## theta (batch 1): 0.0134093
## betas:    1.5747  -0.2108  -0.4459   0.3811   0.4827   0.8385   0.9913   0.7958   1.3813   0.5363  -(
##
## sigma: 0.179708
## lambda (gene 1): 0.872203
## epsilon (gene 1): -0.129416
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 37040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.258
## delta (gene 1): 16.7881
## s (cell 1): 1.15531
## nu (cell 1): 1.03212
## theta (batch 1): 0.0113847
## betas:    0.8876  -0.1219   0.0576   0.4226   0.7197   1.3114   0.9870   1.0291   1.4224   0.5324  -(
##
## sigma: 0.185778
## lambda (gene 1): 2.57326
## epsilon (gene 1): 0.102188
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 37080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 115.094
## delta (gene 1): 17.4085
## s (cell 1): 1.21451
## nu (cell 1): 1.05192
## theta (batch 1): 0.0136892
## betas:    1.4399  -0.2040   0.2485  -0.7094   1.0079   0.9705   0.7900   1.0522   1.2516   0.7212  -(
##
## sigma: 0.190708
## lambda (gene 1): 1.35643
## epsilon (gene 1): 0.147022
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 37120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 155.333
## delta (gene 1): 17.7892
## s (cell 1): 1.15514
## nu (cell 1): 1.19055
## theta (batch 1): 0.00935935
## betas:    0.9832  -0.0224   0.3616   0.1843   1.0205   0.9199   1.2172   0.7187   1.1554   0.5989  -0
##
## sigma: 0.182227
## lambda (gene 1): 0.649637
## epsilon (gene 1): 0.146096
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 37160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 346.312
## delta (gene 1): 16.7751
## s (cell 1): 1.296
## nu (cell 1): 1.08257
## theta (batch 1): 0.00908716
## betas:    1.3951  -0.1345  -0.6574  -0.5318   0.8952   1.2373   0.6710   1.0017   1.1010   0.6443  -0
##
## sigma: 0.177544
## lambda (gene 1): 1.23495
## epsilon (gene 1): 0.106527
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 37200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.417
## delta (gene 1): 13.2527
## s (cell 1): 1.08955
## nu (cell 1): 1.01426
## theta (batch 1): 0.00785719
## betas:    1.4053  -0.2233  -0.5155  -0.3009   0.6753   1.3470   0.5620   1.2325   1.2676   0.6516  -0
##
## sigma: 0.191757
## lambda (gene 1): 0.411588
```

```
## epsilon (gene 1): -0.13898
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 37240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.949
## delta (gene 1): 14.1662
## s (cell 1): 1.02337
## nu (cell 1): 1.05506
## theta (batch 1): 0.00699005
## betas:    1.4122  -0.2272  -0.5527  -0.0593   0.3404   1.3748   0.7432   0.9926   1.4542   0.6141  -(
##
## sigma: 0.185043
## lambda (gene 1): 0.831248
## epsilon (gene 1): -0.0537508
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 37280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.695
## delta (gene 1): 13.3143
## s (cell 1): 1.00508
## nu (cell 1): 1.09712
## theta (batch 1): 0.0151962
## betas:    1.9560  -0.2089  -0.3921  -0.1683   0.2868   1.0980   0.5429   0.9061   1.1316   0.3977  -(
##
## sigma: 0.187196
## lambda (gene 1): 1.04296
## epsilon (gene 1): -0.118763
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 37320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.775
## delta (gene 1): 12.9993
## s (cell 1): 1.02344
```

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## nu (cell 1): 1.06987
## theta (batch 1): 0.00684601
## betas:    1.1420  -0.0224  -0.2354   0.0835   0.9025   1.4416   0.7722   0.7584   1.2693   0.2393  -(
##
## sigma: 0.186161
## lambda (gene 1): 0.866444
## epsilon (gene 1): -0.158813
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 37360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.489
## delta (gene 1): 19.9051
## s (cell 1): 1.30691
## nu (cell 1): 1.27239
## theta (batch 1): 0.00610592
## betas:    1.2945   0.0022  -0.7475   1.1111   0.2623   1.3082   0.7950   0.7543   0.8937   0.5420  -
##
## sigma: 0.189688
## lambda (gene 1): 1.07755
## epsilon (gene 1): 0.266791
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 37400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 325.965
## delta (gene 1): 15.4643
## s (cell 1): 1.11535
## nu (cell 1): 1.12597
## theta (batch 1): 0.00146233
## betas:    1.0041  -0.0615  -0.4116  -0.0934   1.1946   1.1612   0.8660   1.0096   1.1717   0.5814  -(
##
## sigma: 0.187486
## lambda (gene 1): 1.40762
## epsilon (gene 1): 0.00668413
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
```

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## Iteration 37440 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.246
## delta (gene 1): 12.0863
## s (cell 1): 0.983394
## nu (cell 1): 1.04113
## theta (batch 1): 0.001071
## betas:    1.0098  -0.1540  -0.3832  -0.4789   1.0572   1.1668   1.0260   1.0471   1.3218   0.6907  -(
##
## sigma: 0.177623
## lambda (gene 1): 0.652361
## epsilon (gene 1): -0.212506
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 37480 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 120.113
## delta (gene 1): 12.0086
## s (cell 1): 1.13189
## nu (cell 1): 1.12091
## theta (batch 1): 0.00145894
## betas:    1.5282  -0.0953  -0.4021  -0.6463   0.8277   1.4413   0.4118   1.0478   0.9292   0.6140  -
##
## sigma: 0.182911
## lambda (gene 1): 2.50189
## epsilon (gene 1): -0.226552
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 37520 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 169.917
## delta (gene 1): 15.241
## s (cell 1): 0.888094
## nu (cell 1): 1.00992
## theta (batch 1): 0.00595665
## betas:    1.3684  -0.2247  -0.2402  -0.8110   0.6527   1.0281   1.1335   0.7271   1.6013   0.6215  -(
##
## sigma: 0.177056
## lambda (gene 1): 0.566874
## epsilon (gene 1): 0.00582171
## ------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 37560 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 345.659
## delta (gene 1): 11.5042
## s (cell 1): 1.04565
## nu (cell 1): 1.06839
## theta (batch 1): 0.00473937
## betas:    0.9213  -0.1028  -0.5224   0.6734   0.5038   1.6248   0.6814   1.1507   1.2854   0.6416  -
##
## sigma: 0.191188
## lambda (gene 1): 0.326222
## epsilon (gene 1): -0.289753
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 37600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.392
## delta (gene 1): 14.6239
## s (cell 1): 1.0465
## nu (cell 1): 1.01561
## theta (batch 1): 0.0164174
## betas:    1.9849  -0.1672  -0.1286  -0.8735   0.5583   0.6816   1.0227   0.5061   1.0257   0.6503  -
##
## sigma: 0.180793
## lambda (gene 1): 1.13442
## epsilon (gene 1): -0.0460039
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 37640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.825
## delta (gene 1): 14.8748
## s (cell 1): 1.2856
## nu (cell 1): 1.06547
## theta (batch 1): 0.0246701
```

```
## betas:    1.5782  -0.1279   0.1941   0.1182   0.3199   1.2423   0.8344   0.6272   1.3142   0.4531  -(
##
## sigma: 0.179871
## lambda (gene 1): 0.716217
## epsilon (gene 1): -0.0271563
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 37680 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.925
## delta (gene 1): 13.9644
## s (cell 1): 0.923599
## nu (cell 1): 1.02114
## theta (batch 1): 0.0140011
## betas:    1.0966  -0.0574   0.2198  -0.6489   1.3133   1.0732   0.8775   1.0264   0.9198   0.7419  -(
##
## sigma: 0.189815
## lambda (gene 1): 1.04514
## epsilon (gene 1): -0.100748
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 37720 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.91
## delta (gene 1): 18.0948
## s (cell 1): 1.21177
## nu (cell 1): 1.16208
## theta (batch 1): 0.0201512
## betas:    1.1439  -0.0852  -0.1342  -0.1677   1.5641   0.6286   1.2033   0.8013   1.2058   0.5162  -(
##
## sigma: 0.186033
## lambda (gene 1): 0.381571
## epsilon (gene 1): 0.178396
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 37760 out of 40000 has been completed.
## ------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.999
## delta (gene 1): 11.5153
## s (cell 1): 1.02498
## nu (cell 1): 1.07554
## theta (batch 1): 0.0486132
## betas:    1.5179  -0.1536   0.1900  -0.4377   0.5615   1.2799   0.8053   0.8368   1.1631   0.5969  -(
##
## sigma: 0.193167
## lambda (gene 1): 1.58215
## epsilon (gene 1): -0.277903
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 37800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.313
## delta (gene 1): 25.3676
## s (cell 1): 0.832758
## nu (cell 1): 1.01631
## theta (batch 1): 0.0527292
## betas:    1.5515  -0.1552  -0.1051   0.1240   0.0624   1.4452   0.5327   0.9829   1.2388   0.3659  -(
##
## sigma: 0.182977
## lambda (gene 1): 1.37988
## epsilon (gene 1): 0.5204
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 37840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.335
## delta (gene 1): 15.4896
## s (cell 1): 1.3722
## nu (cell 1): 1.02759
## theta (batch 1): 0.0707124
## betas:    1.1881  -0.1126  -0.6668   0.5029   0.2001   1.2278   1.0822   0.7598   1.2508   0.7347  -(
##
## sigma: 0.18632
## lambda (gene 1): 1.08709
## epsilon (gene 1): -0.00772113
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 37880 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 199.12
## delta (gene 1): 17.193
## s (cell 1): 1.22551
## nu (cell 1): 1.02604
## theta (batch 1): 0.0427644
## betas:    1.0565  -0.0095  -0.1335   0.0985   1.1509   1.1052   0.8642   0.8706   1.1185   0.4511  -
##
## sigma: 0.177983
## lambda (gene 1): 1.95072
## epsilon (gene 1): 0.122423
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 37920 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.6
## delta (gene 1): 11.5728
## s (cell 1): 1.09942
## nu (cell 1): 1.02471
## theta (batch 1): 0.0181959
## betas:    1.0989  -0.0307  -0.8502   0.1392   0.8458   1.2812   0.9054   0.7771   1.1773   0.4521  -(
##
## sigma: 0.185691
## lambda (gene 1): 1.85862
## epsilon (gene 1): -0.274666
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------------
## Iteration 37960 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.215
## delta (gene 1): 15.0833
## s (cell 1): 1.07512
## nu (cell 1): 1.13445
## theta (batch 1): 0.00540895
## betas:    1.0506  -0.0793  -0.5160   0.3234   0.5915   1.2702   1.0198   0.7753   1.4374   0.2935  -(
##
```

```
## sigma: 0.179616
## lambda (gene 1): 0.715099
## epsilon (gene 1): 0.00368731
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.201
## delta (gene 1): 15.6582
## s (cell 1): 1.1572
## nu (cell 1): 1.10469
## theta (batch 1): 0.0078233
## betas:    1.3808  -0.1334  -0.4919  -0.2151   0.8282   0.9728   1.0115   0.8098   1.2657   0.4600  -(
##
## sigma: 0.1974
## lambda (gene 1): 1.2424
## epsilon (gene 1): 0.0576323
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.143
## delta (gene 1): 16.58
## s (cell 1): 1.0367
## nu (cell 1): 1.10102
## theta (batch 1): 0.0138555
## betas:    0.4363  -0.0092  -0.0051   0.2393   1.1242   1.7274   0.6835   1.3308   1.3153   0.2914  -(
##
## sigma: 0.182037
## lambda (gene 1): 2.68043
## epsilon (gene 1): 0.0976505
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 136.368
```

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## delta (gene 1): 15.4923
## s (cell 1): 0.771906
## nu (cell 1): 1.08517
## theta (batch 1): 0.0170538
## betas:    1.3423  -0.0804   0.0938  -0.9700   1.2634   1.0121   0.6651   1.0936   0.9378   0.4947  -
##
## sigma: 0.191456
## lambda (gene 1): 0.941772
## epsilon (gene 1): 0.023115
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.076
## delta (gene 1): 13.65
## s (cell 1): 0.964713
## nu (cell 1): 0.974007
## theta (batch 1): 0.00570923
## betas:    1.8171  -0.0629  -0.3873   0.1293   0.3936   1.1617   0.5770   0.5897   1.0717   0.2768  -
##
## sigma: 0.187306
## lambda (gene 1): 0.945564
## epsilon (gene 1): -0.0933319
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.229
## delta (gene 1): 13.1929
## s (cell 1): 1.05711
## nu (cell 1): 1.10722
## theta (batch 1): 0.0069839
## betas:    0.7182  -0.0684   0.4002   0.3873   0.7488   1.4666   0.9633   1.0027   1.5290   0.3177  -
##
## sigma: 0.18031
## lambda (gene 1): 0.469578
## epsilon (gene 1): -0.118439
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 274.347
## delta (gene 1): 15.9923
## s (cell 1): 0.940505
## nu (cell 1): 1.08203
## theta (batch 1): 0.00742181
## betas:    1.3784  -0.1229  -0.5734   0.3620   0.2746   1.3477   0.7028   0.9218   1.2361   0.4215  -
##
## sigma: 0.184727
## lambda (gene 1): 1.65327
## epsilon (gene 1): 0.0577265
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.131
## delta (gene 1): 12.4557
## s (cell 1): 1.3704
## nu (cell 1): 1.0212
## theta (batch 1): 0.0262343
## betas:    1.4700  -0.1045  -0.9696  -0.0955   0.6262   1.2474   0.6614   0.8928   1.1664   0.3283  -
##
## sigma: 0.190819
## lambda (gene 1): 0.823092
## epsilon (gene 1): -0.194506
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 254.256
## delta (gene 1): 17.8049
## s (cell 1): 1.1316
## nu (cell 1): 1.13502
## theta (batch 1): 0.0158617
## betas:    1.2336  -0.1191   0.0196  -0.1967   0.8292   0.7758   1.2308   0.8017   1.1425   0.7681  -
##
## sigma: 0.174515
## lambda (gene 1): 0.31843
```

```
## epsilon (gene 1): 0.175507
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 38320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.393
## delta (gene 1): 15.0268
## s (cell 1): 1.37303
## nu (cell 1): 1.14229
## theta (batch 1): 0.0219327
## betas:    1.0283  -0.1356  -0.2496   0.2981   0.9947   1.1077   1.1299   0.8065   1.4703   0.6312  -(
##
## sigma: 0.177243
## lambda (gene 1): 0.69715
## epsilon (gene 1): -0.0067294
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 38360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.955
## delta (gene 1): 14.3578
## s (cell 1): 1.14245
## nu (cell 1): 1.05247
## theta (batch 1): 0.02748
## betas:    1.2995  -0.0971  -0.1813  -0.0196   0.7204   1.1530   0.9316   0.7785   1.1856   0.7003  -
##
## sigma: 0.188548
## lambda (gene 1): 0.44303
## epsilon (gene 1): -0.0607265
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 38400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.25
## delta (gene 1): 13.6447
## s (cell 1): 0.865985
```

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## nu (cell 1): 1.01005
## theta (batch 1): 0.0213018
## betas:    1.5811  -0.2066  -0.1174  -0.1606   0.8150   0.9664   0.9365   0.6006   1.6748   0.3009  -(
##
## sigma: 0.188217
## lambda (gene 1): 0.817965
## epsilon (gene 1): -0.108716
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 38440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.757
## delta (gene 1): 15.9556
## s (cell 1): 1.0508
## nu (cell 1): 1.11511
## theta (batch 1): 0.00982928
## betas:    1.1664  -0.1117  -0.1169   0.3545   0.2449   1.3982   0.8995   0.9154   1.2242   0.6654  -(
##
## sigma: 0.176438
## lambda (gene 1): 0.630008
## epsilon (gene 1): 0.0702997
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 38480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.388
## delta (gene 1): 12.9781
## s (cell 1): 1.22491
## nu (cell 1): 1.12955
## theta (batch 1): 0.004822
## betas:    1.1211  -0.1358   0.7173   0.3798   0.5948   1.1860   0.8770   1.1118   1.1433   0.7935  -(
##
## sigma: 0.182469
## lambda (gene 1): 1.18153
## epsilon (gene 1): -0.13517
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
```

```
## Iteration 38520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 317.691
## delta (gene 1): 19.293
## s (cell 1): 1.07534
## nu (cell 1): 1.11994
## theta (batch 1): 0.00781157
## betas:    1.4630  -0.2320  -0.2676   0.0909   0.7449   1.0308   0.6518   1.3779   0.8726   1.1612  -(
##
## sigma: 0.182201
## lambda (gene 1): 2.38452
## epsilon (gene 1): 0.255259
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.325
## delta (gene 1): 16.3043
## s (cell 1): 1.37655
## nu (cell 1): 1.13169
## theta (batch 1): 0.00458521
## betas:    1.4811  -0.2600  -0.0145   0.2864   0.1449   1.0961   0.9455   1.0613   1.1885   1.0839  -(
##
## sigma: 0.184501
## lambda (gene 1): 0.711449
## epsilon (gene 1): 0.0688909
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.26
## delta (gene 1): 13.3647
## s (cell 1): 1.09932
## nu (cell 1): 1.03912
## theta (batch 1): 0.00781443
## betas:    1.4445  -0.2360  -0.2664  -0.1565   1.0024   0.5712   1.1413   0.9722   1.2804   0.7243   (
##
## sigma: 0.18195
## lambda (gene 1): 1.57805
## epsilon (gene 1): -0.130641
## ----------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.313
## delta (gene 1): 11.0099
## s (cell 1): 1.12048
## nu (cell 1): 1.15848
## theta (batch 1): 0.0226691
## betas:    1.6389  -0.1574  -0.7049   0.2705   0.8039   0.6946   0.9129   0.8891   0.9887   0.7186   -0
##
## sigma: 0.186774
## lambda (gene 1): 1.11962
## epsilon (gene 1): -0.313937
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.095
## delta (gene 1): 15.5331
## s (cell 1): 0.857291
## nu (cell 1): 1.18099
## theta (batch 1): 0.0224382
## betas:    1.6505  -0.1050  -0.4967   0.1355   0.4778   1.1021   0.6588   0.8898   0.8958   0.6469   -
##
## sigma: 0.178504
## lambda (gene 1): 1.22872
## epsilon (gene 1): 0.0124587
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.536
## delta (gene 1): 11.6184
## s (cell 1): 1.32961
## nu (cell 1): 1.00946
## theta (batch 1): 0.0351764
```

```
## betas:     1.0044  -0.1360  -0.0668  -0.0571   0.7481   1.2644   0.9366   1.0329   1.4252   0.5109  -(
##
## sigma: 0.181155
## lambda (gene 1): 0.200798
## epsilon (gene 1): -0.256451
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 125.374
## delta (gene 1): 19.1823
## s (cell 1): 1.02699
## nu (cell 1): 1.07161
## theta (batch 1): 0.0616694
## betas:     0.8952  -0.0833   0.3107  -0.1355   1.2210   0.7539   1.4686   0.6528   1.3931   0.7281  -(
##
## sigma: 0.181433
## lambda (gene 1): 2.34634
## epsilon (gene 1): 0.230039
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 129.672
## delta (gene 1): 14.6598
## s (cell 1): 1.22669
## nu (cell 1): 1.06939
## theta (batch 1): 0.0217745
## betas:     1.3071  -0.1800  -0.4699   0.0716   0.4619   0.9847   1.0569   0.8879   1.3543   0.6545  -(
##
## sigma: 0.19632
## lambda (gene 1): 0.646057
## epsilon (gene 1): -0.0337627
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38840 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.619
## delta (gene 1): 12.6157
## s (cell 1): 1.37168
## nu (cell 1): 1.18555
## theta (batch 1): 0.0203602
## betas:     0.9355  -0.0480  -0.6705   0.7474   0.5773   1.5087   0.8799   1.0178   0.8831   1.2065  -
##
## sigma: 0.194934
## lambda (gene 1): 1.78315
## epsilon (gene 1): -0.19868
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.16
## delta (gene 1): 15.5665
## s (cell 1): 1.0278
## nu (cell 1): 0.971912
## theta (batch 1): 0.0111012
## betas:     1.0960  -0.2270   0.1987  -0.7773   0.6699   1.3168   1.0695   0.7064   2.0345   0.3770  -
##
## sigma: 0.190782
## lambda (gene 1): 1.25286
## epsilon (gene 1): 0.0235091
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 38920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 199.576
## delta (gene 1): 18.4401
## s (cell 1): 1.31031
## nu (cell 1): 1.08938
## theta (batch 1): 0.0185719
## betas:     1.2300  -0.2755  -0.3683  -1.0567   1.5958   0.5439   1.3172   0.9426   1.6069   0.7836
##
## sigma: 0.192348
## lambda (gene 1): 1.93564
## epsilon (gene 1): 0.201153
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
```

```
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 38960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.157
## delta (gene 1): 15.9417
## s (cell 1): 1.78552
## nu (cell 1): 1.18603
## theta (batch 1): 0.0624327
## betas:    1.3284  -0.1483  -0.2596  -0.0348   0.7565   0.7471   1.3204   0.6088   1.4917   0.3425  -(
##
## sigma: 0.183252
## lambda (gene 1): 1.21056
## epsilon (gene 1): 0.0336999
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 39000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.278
## delta (gene 1): 16.6146
## s (cell 1): 1.10713
## nu (cell 1): 1.09508
## theta (batch 1): 0.0487088
## betas:    1.3288  -0.1330  -0.1535   0.0395   0.4154   1.2707   0.6489   1.2058   0.9915   0.6424  -(
##
## sigma: 0.183272
## lambda (gene 1): 0.733239
## epsilon (gene 1): 0.090517
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 39040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.206
## delta (gene 1): 17.5304
## s (cell 1): 1.26799
## nu (cell 1): 1.09361
## theta (batch 1): 0.0466946
## betas:    0.9838  -0.0060   0.0888   0.4221   0.7339   1.2910   0.8548   1.1099   0.7182   0.8593  -
##
```

```
## sigma: 0.186752
## lambda (gene 1): 0.677345
## epsilon (gene 1): 0.15905
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 39080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.341
## delta (gene 1): 15.9383
## s (cell 1): 1.10057
## nu (cell 1): 1.14918
## theta (batch 1): 0.0194628
## betas:    0.7991  -0.1138  -0.7978   0.3637   1.3502   1.0034   1.1010   1.0739   1.3120   0.8772  -0
##
## sigma: 0.178802
## lambda (gene 1): 1.00055
## epsilon (gene 1): 0.0426222
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 39120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.82
## delta (gene 1): 12.9172
## s (cell 1): 0.97986
## nu (cell 1): 1.0949
## theta (batch 1): 0.00863719
## betas:    0.6455  -0.0456   0.2267   0.2140   1.2718   0.9059   1.3153   0.9503   1.1845   1.0099  -
##
## sigma: 0.191181
## lambda (gene 1): 2.22982
## epsilon (gene 1): -0.17634
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 39160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.993
```

```
## delta (gene 1): 15.6914
## s (cell 1): 1.02121
## nu (cell 1): 1.10196
## theta (batch 1): 0.0115236
## betas:     1.3902  -0.0517  -0.2390   0.2583   0.2546   1.6876   0.4811   0.9240   1.0173   0.3621  -(
##
## sigma: 0.176592
## lambda (gene 1): 0.376953
## epsilon (gene 1): 0.0384515
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 39200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.174
## delta (gene 1): 16.4045
## s (cell 1): 1.22973
## nu (cell 1): 1.05214
## theta (batch 1): 0.01665
## betas:     1.4311  -0.1736  -0.2525  -0.5540   0.7985   1.0906   0.9392   0.7249   1.5206   0.4213  -(
##
## sigma: 0.182281
## lambda (gene 1): 3.26011
## epsilon (gene 1): 0.0830526
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 39240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.111
## delta (gene 1): 14.7366
## s (cell 1): 1.96261
## nu (cell 1): 1.12936
## theta (batch 1): 0.0646265
## betas:     1.0663  -0.1389   0.0804  -0.1381   0.4113   1.6090   0.8158   1.0093   1.4465   0.4011  -(
##
## sigma: 0.187235
## lambda (gene 1): 1.4366
## epsilon (gene 1): -0.0134693
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
```

```
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 39280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.386
## delta (gene 1): 14.0073
## s (cell 1): 0.841868
## nu (cell 1): 1.09231
## theta (batch 1): 0.0556005
## betas:    1.3455  -0.1181  -0.1120   0.3475   0.4187   1.1856   0.8592   0.9389   1.1137   0.5670  -(
##
## sigma: 0.173902
## lambda (gene 1): 0.669726
## epsilon (gene 1): -0.073302
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 39320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.349
## delta (gene 1): 11.0394
## s (cell 1): 0.977175
## nu (cell 1): 1.01667
## theta (batch 1): 0.0295419
## betas:    0.8611  -0.2497   0.2194   0.0299   0.5487   1.3586   1.2428   0.8554   2.0764   0.4410   (
##
## sigma: 0.196824
## lambda (gene 1): 1.6053
## epsilon (gene 1): -0.324436
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 39360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 188.855
## delta (gene 1): 14.0883
## s (cell 1): 0.745499
## nu (cell 1): 1.0463
## theta (batch 1): 0.0215818
## betas:    1.1759  -0.1942   0.2342  -0.2118   0.5606   1.0853   1.0145   1.0991   1.1956   0.9796  -(
##
## sigma: 0.185765
## lambda (gene 1): 1.79894
```

```
## epsilon (gene 1): -0.0909135
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 39400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 335.932
## delta (gene 1): 17.1189
## s (cell 1): 1.10704
## nu (cell 1): 1.1123
## theta (batch 1): 0.00902983
## betas:    1.1728  -0.1584  -0.1865   0.2063   0.8360   0.9501   1.0863   1.0406   1.1001   1.0067  -
##
## sigma: 0.180355
## lambda (gene 1): 1.24659
## epsilon (gene 1): 0.161125
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 39440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.28
## delta (gene 1): 14.102
## s (cell 1): 1.08507
## nu (cell 1): 1.06292
## theta (batch 1): 0.0131129
## betas:    1.5975  -0.1549  -0.8343  -0.5675   1.2340   0.9460   0.5780   0.9620   1.2252   0.4961  -
##
## sigma: 0.195132
## lambda (gene 1): 0.797815
## epsilon (gene 1): -0.0668932
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 39480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.48
## delta (gene 1): 13.8306
## s (cell 1): 1.09254
```

```
## nu (cell 1): 1.16187
## theta (batch 1): 0.0115803
## betas:    1.1426  -0.0933  -0.5425   0.3395   0.6066   1.2151   0.9982   0.7853   1.3482   0.4271  -(
##
## sigma: 0.179933
## lambda (gene 1): 2.3179
## epsilon (gene 1): -0.0920659
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 39520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 412.045
## delta (gene 1): 16.6522
## s (cell 1): 1.23239
## nu (cell 1): 1.04378
## theta (batch 1): 0.0237732
## betas:    0.6304  -0.0690  -0.4527   0.5423   0.7094   1.4573   1.1973   0.9380   1.2919   0.9311  -(
##
## sigma: 0.185505
## lambda (gene 1): 0.919574
## epsilon (gene 1): 0.0559366
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 39560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.16
## delta (gene 1): 15.5122
## s (cell 1): 1.25477
## nu (cell 1): 1.03135
## theta (batch 1): 0.016819
## betas:    1.0922  -0.2029   0.0213  -0.2694   0.8527   1.0094   1.1509   1.0520   1.3124   0.9569  -(
##
## sigma: 0.182734
## lambda (gene 1): 1.33457
## epsilon (gene 1): 0.0325033
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
```

```
## Iteration 39600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.568
## delta (gene 1): 15.217
## s (cell 1): 0.869719
## nu (cell 1): 1.08512
## theta (batch 1): 0.0101808
## betas:    1.3085  -0.1429  -0.2407  -0.2161   0.2293   1.4618   0.7314   1.0629   1.0732   0.8620  -(
##
## sigma: 0.186121
## lambda (gene 1): 1.06398
## epsilon (gene 1): 0.00155972
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 39640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 136.253
## delta (gene 1): 13.9985
## s (cell 1): 1.13787
## nu (cell 1): 1.18582
## theta (batch 1): 0.0296099
## betas:    1.0242  -0.0637   0.1618   0.1703   0.5566   1.3731   1.2939   0.2648   1.9188   0.0353  -(
##
## sigma: 0.188321
## lambda (gene 1): 0.878707
## epsilon (gene 1): -0.0857367
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 39680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.111
## delta (gene 1): 14.2043
## s (cell 1): 1.21256
## nu (cell 1): 1.11594
## theta (batch 1): 0.0262997
## betas:    1.1134  -0.0239  -0.5644   0.4635   0.9003   0.9008   1.2612   0.5278   1.3856   0.1369  -(
##
## sigma: 0.185783
## lambda (gene 1): 1.16741
## epsilon (gene 1): -0.0636487
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 39720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.613
## delta (gene 1): 12.9993
## s (cell 1): 1.15834
## nu (cell 1): 1.07894
## theta (batch 1): 0.0384097
## betas:    0.9403  -0.0739   0.3485   0.0320   0.8068   1.4124   0.9244   0.9140   1.3020   0.6563  -(
##
## sigma: 0.185136
## lambda (gene 1): 1.18268
## epsilon (gene 1): -0.159378
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 39760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.385
## delta (gene 1): 15.4251
## s (cell 1): 1.26547
## nu (cell 1): 0.958766
## theta (batch 1): 0.0845893
## betas:    1.6156  -0.2477  -1.0900   0.0389   0.2613   1.2749   0.8123   0.8254   1.4496   0.6698  -(
##
## sigma: 0.182183
## lambda (gene 1): 1.20108
## epsilon (gene 1): 0.0298432
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 39800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 287.942
## delta (gene 1): 14.4178
## s (cell 1): 1.14597
## nu (cell 1): 1.08228
## theta (batch 1): 0.0557934
```

```
## betas:      1.0083  -0.1156  -0.8862   0.4531   0.7891   1.2356   0.9102   1.1296   1.1527   0.8048  -(
##
## sigma: 0.18967
## lambda (gene 1): 1.9063
## epsilon (gene 1): -0.0442603
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 39840 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.985
## delta (gene 1): 18.129
## s (cell 1): 1.01499
## nu (cell 1): 1.10082
## theta (batch 1): 0.0281606
## betas:      1.3379  -0.0602  -0.4621   0.0702   1.2146   0.6712   1.1121   0.7638   0.9832   0.6202  -(
##
## sigma: 0.187937
## lambda (gene 1): 1.09517
## epsilon (gene 1): 0.180773
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 39880 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.754
## delta (gene 1): 16.8951
## s (cell 1): 0.925678
## nu (cell 1): 1.03853
## theta (batch 1): 0.0102669
## betas:      1.4680  -0.1042  -0.3183  -0.0252   0.0873   1.4965   0.7736   0.7005   1.2458   0.5130  -1
##
## sigma: 0.190769
## lambda (gene 1): 0.862444
## epsilon (gene 1): 0.117428
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 39920 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.293
## delta (gene 1): 15.4289
## s (cell 1): 1.17742
## nu (cell 1): 1.16148
## theta (batch 1): 0.00481519
## betas:    1.2208  -0.2549  -0.2953   0.2031   0.0044   1.5797   0.8417   1.0187   1.6391   0.6525  -(
##
## sigma: 0.184586
## lambda (gene 1): 1.29773
## epsilon (gene 1): 0.0243882
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 39960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 342.115
## delta (gene 1): 17.994
## s (cell 1): 1.24296
## nu (cell 1): 1.09704
## theta (batch 1): 0.00643076
## betas:    1.4892  -0.1280  -0.4133  -0.3409   0.9414   1.0755   0.5751   1.0896   1.0416   0.5265  -(
##
## sigma: 0.18912
## lambda (gene 1): 1.76714
## epsilon (gene 1): 0.182622
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
##
## -------------------------------------------------------
## -------------------------------------------------------
## All 40000 MCMC iterations have been completed.
## -------------------------------------------------------
## -------------------------------------------------------
##
## -------------------------------------------------------
## Please see below a summary of the overall acceptance rates.
## -------------------------------------------------------
##
## Minimum acceptance rate among mu[i]'s: 0.0655
## Average acceptance rate among mu[i]'s: 0.408119
## Maximum acceptance rate among mu[i]'s: 0.81495
##
##
## Minimum acceptance rate among delta[i]'s: 0.34265
```

```
## Average acceptance rate among delta[i]'s: 0.450455
## Maximum acceptance rate among delta[i]'s: 0.556
##
##
## Minimum acceptance rate among nu[jk]'s: 0.34895
## Average acceptance rate among nu[jk]'s: 0.438415
## Maximum acceptance rate among nu[jk]'s: 0.5046
##
##
## Minimum acceptance rate among theta[k]'s: 0.4354
## Average acceptance rate among theta[k]'s: 0.4354
## Maximum acceptance rate among theta[k]'s: 0.4354
##
##
## -------------------------------------------------------
##


## ----------------------------------------------------------------
## MCMC running time
## ----------------------------------------------------------------
## user: 23642.736
## system: 18906.969
## elapsed: 5651.652


## ----------------------------------------------------------------
## Output
## ----------------------------------------------------------------


## ----------------------------------------------------------------
## BASiCS_Chain object stored as chain_naive.Rds file in
## 'rds/' directory ...
## ----------------------------------------------------------------


## ----------------------------------------------------------------
## BASiCS version 2.14.0 : horizontal integration (no-spikes case)
## ----------------------------------------------------------------


## Randomly, 1 out of 1034
## genes was left as reference at each iteration
## List of reference genes and frequencies stored as a .txt file in
## 'rds/' directory ...
## ----------------------------------------------------------------
```

```r
set.seed(43)
chain_active <- BASiCS_MCMC(
  Data = sce_active,
  PrintProgress = TRUE,
  N = 40000,
  Thin = 20,
  Burn = 20000,
  Regression = TRUE,
  Threads = 4,
```

```
  StoreChains = TRUE,
  StoreDir = "rds/",
  RunName = "active",
  WithSpikes = FALSE
)
```

```
## Warning in .BASiCS_MCMC_InputCheck(Data, N, Thin, Burn, Regression, WithSpikes, : 'Data' should conta
## Please assign the batch information to:
##
##          'colData(Data)$BatchInfo = BatchInfo'.

## Warning in .BASiCS_MCMC_InputCheck(Data, N, Thin, Burn, Regression, WithSpikes, : Some genes have zer
## If comparing 2 groups, use 'PriorDelta = 'log-normal' in BASiCS_MCMC.
## If not, please remove those genes.


## Running no spikes BASiCS sampler (regression case) ...


## --------------------------------------------------------
## MCMC sampler has been started: 40000 iterations to go.
## --------------------------------------------------------
## --------------------------------------------------------
## Iteration 0 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 547.651
## delta (gene 1): 7.62199
## s (cell 1): 0.940873
## nu (cell 1): 0.940414
## theta (batch 1): 0.630466
## betas:    0.1268  -0.0043  -0.9941   0.9031   1.6246  -2.4835   1.0851   3.3797  -1.5228   0.9357   (
##
## sigma: 0.466348
## lambda (gene 1): 1.41763
## epsilon (gene 1): 0.826117
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -4
## LSdelta (gene 1): -2
## LSnu (cell 1): -10
## LStheta (batch 1): -4
## --------------------------------------------------------
## Iteration 40 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 673.118
## delta (gene 1): 12.7764
## s (cell 1): 1.61115
## nu (cell 1): 0.970123
## theta (batch 1): 0.336375
## betas:    0.7261  -0.1573  -0.5908  -0.2451   1.4554   1.4741   0.5044   1.7330   0.8038   0.6840  -(
##
## sigma: 0.259078
## lambda (gene 1): 0.309412
```

```
## epsilon (gene 1): 0.737214
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -4
## LSdelta (gene 1): -2
## LSnu (cell 1): -10
## LStheta (batch 1): -4
## -------------------------------------------------------
## Iteration 80 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 426.957
## delta (gene 1): 11.0358
## s (cell 1): 1.699
## nu (cell 1): 0.991988
## theta (batch 1): 0.148458
## betas:    1.1617  -0.2826  -0.8343  -0.4088   1.2590   1.4791   0.4541   1.5383   1.2979   0.3235
##
## sigma: 0.240598
## lambda (gene 1): 0.482145
## epsilon (gene 1): 0.748018
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.9
## LStheta (batch 1): -3.9
## -------------------------------------------------------
## Iteration 120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 649.599
## delta (gene 1): 10.1574
## s (cell 1): 1.33028
## nu (cell 1): 1.04896
## theta (batch 1): 0.109456
## betas:    1.4876  -0.2284  -0.3436  -0.2225   1.1770   0.6151   1.0997   1.0288   0.9823   0.5840  -(
##
## sigma: 0.243027
## lambda (gene 1): 1.90831
## epsilon (gene 1): 0.271019
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.8
## LStheta (batch 1): -3.8
## -------------------------------------------------------
## Iteration 160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.269
## delta (gene 1): 16.1571
## s (cell 1): 0.973173
```

```
## nu (cell 1): 1.04154
## theta (batch 1): 0.0669254
## betas:     0.9711  -0.2624   0.4346   0.3285  -0.0578   1.4840   1.2326   1.0189   1.4119   0.8628
##
## sigma: 0.231896
## lambda (gene 1): 2.26943
## epsilon (gene 1): 0.355776
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -9.7
## LStheta (batch 1): -3.7
## -------------------------------------------------------
## Iteration 200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 337.785
## delta (gene 1): 9.36802
## s (cell 1): 1.01703
## nu (cell 1): 1.07752
## theta (batch 1): 0.04604
## betas:     1.5788  -0.1572   0.6517  -0.1711   0.3072   0.6869   1.4088   0.5109   1.0261   0.5556
##
## sigma: 0.248697
## lambda (gene 1): 0.946903
## epsilon (gene 1): -0.0433498
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.6
## LStheta (batch 1): -3.6
## -------------------------------------------------------
## Iteration 240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 375.02
## delta (gene 1): 6.98817
## s (cell 1): 0.839107
## nu (cell 1): 1.01918
## theta (batch 1): 0.0482644
## betas:     1.4438  -0.2236   0.7667  -0.4251   0.0601   0.9442   1.5390   0.4445   1.4274   0.4932
##
## sigma: 0.233602
## lambda (gene 1): 1.21781
## epsilon (gene 1): -0.344694
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.6
## LStheta (batch 1): -3.6
## -------------------------------------------------------
```

```
## Iteration 280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 605.041
## delta (gene 1): 9.16075
## s (cell 1): 0.786837
## nu (cell 1): 0.961736
## theta (batch 1): 0.0640691
## betas:    1.1466  -0.3414   0.2119  -0.0006  -0.2931   1.3218   1.3561   1.1805   1.0923   1.4082   (
##
## sigma: 0.214915
## lambda (gene 1): 1.61175
## epsilon (gene 1): 0.0338868
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.5
## LStheta (batch 1): -3.5
## -------------------------------------------------------
## Iteration 320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 401.519
## delta (gene 1): 7.91966
## s (cell 1): 1.49737
## nu (cell 1): 1.05726
## theta (batch 1): 0.110004
## betas:    1.3417  -0.3193   0.1329   0.0673  -0.3556   1.1365   0.9918   1.3909   0.8953   1.2492   (
##
## sigma: 0.219018
## lambda (gene 1): 0.809604
## epsilon (gene 1): -0.170325
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -9.4
## LStheta (batch 1): -3.4
## -------------------------------------------------------
## Iteration 360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.854
## delta (gene 1): 9.28036
## s (cell 1): 1.17488
## nu (cell 1): 1.00738
## theta (batch 1): 0.0668811
## betas:    1.3948  -0.3076   0.4996  -0.3012  -0.4836   1.2729   1.2577   0.8325   1.1186   1.6232   -(
##
## sigma: 0.235081
## lambda (gene 1): 0.285043
## epsilon (gene 1): 0.453842
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.3
## LStheta (batch 1): -3.3
## -------------------------------------------------------
## Iteration 400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 364.708
## delta (gene 1): 10.8997
## s (cell 1): 1.13962
## nu (cell 1): 1.04388
## theta (batch 1): 0.0590526
## betas:    1.5006  -0.2305   0.6370  -0.4948  -0.4628   1.3053   1.0617   0.9464   0.8331   1.2150  -0
##
## sigma: 0.260175
## lambda (gene 1): 1.67742
## epsilon (gene 1): 0.194684
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -9.2
## LStheta (batch 1): -3.2
## -------------------------------------------------------
## Iteration 440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 613.934
## delta (gene 1): 10.2499
## s (cell 1): 1.39531
## nu (cell 1): 1.05149
## theta (batch 1): 0.0567434
## betas:    1.1463  -0.1314   0.8654   0.4280  -0.2863   1.0163   1.3595   0.9069   0.9053   0.8007  -0
##
## sigma: 0.232789
## lambda (gene 1): 0.922693
## epsilon (gene 1): 0.173939
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -9.2
## LStheta (batch 1): -3.2
## -------------------------------------------------------
## Iteration 480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 606.507
## delta (gene 1): 9.05976
## s (cell 1): 1.1392
## nu (cell 1): 1.10836
## theta (batch 1): 0.0577789
```

```
## betas:     1.1317  -0.2584    0.5614    0.3411  -0.6355    1.2039    1.5670    0.7546    1.2932    1.0807  (
##
## sigma: 0.230639
## lambda (gene 1): 0.750387
## epsilon (gene 1): 0.404012
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -9.1
## LStheta (batch 1): -3.1
## -------------------------------------------------------
## Iteration 520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 601.996
## delta (gene 1): 11.0004
## s (cell 1): 0.868456
## nu (cell 1): 1.01538
## theta (batch 1): 0.0118432
## betas:     1.5035  -0.2064    0.5855    0.1724  -0.4002    0.9270    1.3154    0.7501    0.9633    0.9548  -(
##
## sigma: 0.241033
## lambda (gene 1): 1.13888
## epsilon (gene 1): 0.314089
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -9
## LStheta (batch 1): -3
## -------------------------------------------------------
## Iteration 560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 601.08
## delta (gene 1): 10.1238
## s (cell 1): 1.03016
## nu (cell 1): 0.998897
## theta (batch 1): 0.00924538
## betas:     1.7559  -0.1949    0.6754    0.6587  -0.4833    0.4661    1.2606    0.5313    1.3226    0.2541  (
##
## sigma: 0.234004
## lambda (gene 1): 0.913464
## epsilon (gene 1): 0.50883
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -8.9
## LStheta (batch 1): -2.9
## -------------------------------------------------------
## Iteration 600 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 311.342
## delta (gene 1): 10.8058
## s (cell 1): 1.00664
## nu (cell 1): 1.00226
## theta (batch 1): 0.00459101
## betas:    1.2876  -0.3216   0.4203  -0.2955  -0.1974   1.0361   1.4485   0.6513   1.6739   0.7737   (
##
## sigma: 0.258841
## lambda (gene 1): 0.671214
## epsilon (gene 1): 0.0145224
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -8.8
## LStheta (batch 1): -2.8
## -------------------------------------------------------
## Iteration 640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 588.231
## delta (gene 1): 11.7416
## s (cell 1): 1.05105
## nu (cell 1): 1.04496
## theta (batch 1): 0.00246337
## betas:    1.6156  -0.2556  -0.6148   0.5133  -0.1669   0.6757   1.4217   0.6682   1.1301   0.8386  -(
##
## sigma: 0.24005
## lambda (gene 1): 0.953298
## epsilon (gene 1): 0.142416
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -8.8
## LStheta (batch 1): -2.8
## -------------------------------------------------------
## Iteration 680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 387.164
## delta (gene 1): 10.1091
## s (cell 1): 0.997582
## nu (cell 1): 1.03126
## theta (batch 1): 0.00132754
## betas:    1.8096  -0.2644  -0.8085  -0.2877  -0.3600   1.4208   0.9561   0.7110   1.0434   0.7486  -(
##
## sigma: 0.237649
## lambda (gene 1): 1.44107
## epsilon (gene 1): 0.478588
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.7
```

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## LSdelta (gene 1): -1.7
## LSnu (cell 1): -8.7
## LStheta (batch 1): -2.7
## ---------------------------------------------------------
## Iteration 720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 308.794
## delta (gene 1): 11.0464
## s (cell 1): 1.07433
## nu (cell 1): 1.04772
## theta (batch 1): 0.00461726
## betas:    1.1461  -0.2667   0.0699  -0.2161   0.2290   0.7211   1.4925   1.0487   1.1265   1.1184   (
##
## sigma: 0.242362
## lambda (gene 1): 0.253441
## epsilon (gene 1): 0.702545
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -8.6
## LStheta (batch 1): -2.6
## ---------------------------------------------------------
## Iteration 760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 416.872
## delta (gene 1): 9.39743
## s (cell 1): 1.1663
## nu (cell 1): 1.11011
## theta (batch 1): 0.00683719
## betas:    1.6507  -0.2510  -0.3082  -0.5072   0.1823   0.7497   1.2290   0.8777   0.7990   1.1028  -(
##
## sigma: 0.242997
## lambda (gene 1): 0.259685
## epsilon (gene 1): 0.148864
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -8.5
## LStheta (batch 1): -2.5
## ---------------------------------------------------------
## Iteration 800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 532.138
## delta (gene 1): 9.62589
## s (cell 1): 1.19659
## nu (cell 1): 1.09905
## theta (batch 1): 0.0375668
## betas:    0.9519  -0.2762   0.6105  -0.2588   0.0299   1.2489   1.3889   1.0111   1.2964   1.1897   (
##
```

```
## sigma: 0.265508
## lambda (gene 1): 1.37891
## epsilon (gene 1): 0.323635
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -8.4
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 570.37
## delta (gene 1): 9.87722
## s (cell 1): 0.975185
## nu (cell 1): 1.03761
## theta (batch 1): 0.0249237
## betas:    1.4993  -0.3027   0.6624  -0.7311  -0.2753   1.4072   1.0024   1.0104   0.9966   1.2545  -(
##
## sigma: 0.239886
## lambda (gene 1): 1.04364
## epsilon (gene 1): 0.369192
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -8.4
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 467.621
## delta (gene 1): 7.99331
## s (cell 1): 1.3634
## nu (cell 1): 1.00628
## theta (batch 1): 0.0449083
## betas:    0.8848  -0.1993   0.2311   0.4956  -0.3152   0.9946   1.3272   1.2976   0.8548   1.3758  -(
##
## sigma: 0.245459
## lambda (gene 1): 1.47049
## epsilon (gene 1): 0.234567
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -8.3
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 399.908
```

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## delta (gene 1): 11.0469
## s (cell 1): 0.80128
## nu (cell 1): 1.08079
## theta (batch 1): 0.0804123
## betas:    0.5518  -0.1448   0.3289   0.0975   0.5400   0.9814   1.9944   0.4732   1.5401   1.1296  -(
##
## sigma: 0.252362
## lambda (gene 1): 0.524874
## epsilon (gene 1): 0.720583
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -8.2
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 356.981
## delta (gene 1): 11.6747
## s (cell 1): 0.965094
## nu (cell 1): 1.13468
## theta (batch 1): 0.0841979
## betas:    0.7355  -0.1222   0.3820  -0.6080   0.3474   1.3952   1.4920   0.7380   1.3064   0.9075  -(
##
## sigma: 0.252199
## lambda (gene 1): 0.754913
## epsilon (gene 1): 0.384753
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -8.1
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 1000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 355.833
## delta (gene 1): 9.42334
## s (cell 1): 0.98832
## nu (cell 1): 1.12154
## theta (batch 1): 0.0802935
## betas:    0.9220  -0.2041  -0.2391  -0.3166  -0.0346   1.5369   1.3833   0.7244   1.3234   1.0259  -(
##
## sigma: 0.264658
## lambda (gene 1): 0.262648
## epsilon (gene 1): -0.0415381
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -8
```

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## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 1040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.17
## delta (gene 1): 10.4376
## s (cell 1): 1.25461
## nu (cell 1): 1.04306
## theta (batch 1): 0.0714204
## betas:    1.2630  -0.2347  -0.1197  -0.4822  -0.2845   1.2710   1.5346   0.4485   1.6093   0.5782  (
##
## sigma: 0.249575
## lambda (gene 1): 1.92773
## epsilon (gene 1): 0.0972582
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 1080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 383.054
## delta (gene 1): 7.4964
## s (cell 1): 1.08746
## nu (cell 1): 1.06207
## theta (batch 1): 0.00731285
## betas:    1.3815  -0.3252  -1.5793   0.2142  -0.5360   0.9863   1.5859   0.6713   1.4350   0.9376  (
##
## sigma: 0.248472
## lambda (gene 1): 1.06512
## epsilon (gene 1): 0.183101
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -7.9
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 1120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 445.424
## delta (gene 1): 8.30156
## s (cell 1): 1.00905
## nu (cell 1): 1.02505
## theta (batch 1): 0.0378075
## betas:    0.9336  -0.0544  -0.5980   0.1136   0.7943   1.1830   1.2235   0.8235   1.0366   0.3792  -(
##
## sigma: 0.249186
## lambda (gene 1): 2.13217
```

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## epsilon (gene 1): 0.185261
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -7.8
## LStheta (batch 1): -1.8
## ------------------------------------------------------------
## Iteration 1160 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.524
## delta (gene 1): 9.90572
## s (cell 1): 1.26324
## nu (cell 1): 1.06923
## theta (batch 1): 0.010702
## betas:    0.9523  -0.1381  -0.6382  -0.3798   0.9596   1.0015   1.0062   1.4773   0.5781   1.1028
##
## sigma: 0.263372
## lambda (gene 1): 2.70294
## epsilon (gene 1): 0.341713
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -7.7
## LStheta (batch 1): -1.7
## ------------------------------------------------------------
## Iteration 1200 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.51
## delta (gene 1): 8.41167
## s (cell 1): 1.20341
## nu (cell 1): 1.07861
## theta (batch 1): 0.0204482
## betas:    0.9321  -0.2707  -0.9074  -0.2312   0.2006   1.0313   1.6742   0.6441   1.7326   0.7022
##
## sigma: 0.266443
## lambda (gene 1): 0.352848
## epsilon (gene 1): -0.214571
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -7.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 1240 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 527.308
## delta (gene 1): 14.7445
## s (cell 1): 1.51451
```

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## nu (cell 1): 1.09828
## theta (batch 1): 0.0857066
## betas:    1.3676  -0.1030  -0.2325  -0.5884   0.3135   1.4091   0.8319   0.7775   0.9190   0.7912  -
##
## sigma: 0.254558
## lambda (gene 1): 0.445607
## epsilon (gene 1): 0.32886
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -7.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 1280 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 565.645
## delta (gene 1): 8.12476
## s (cell 1): 1.50166
## nu (cell 1): 1.01761
## theta (batch 1): 0.0614302
## betas:    1.7681  -0.2234  -0.9440  -1.0398   0.1715   1.3344   0.8933   0.6866   0.9919   0.7790  -
##
## sigma: 0.245933
## lambda (gene 1): 0.560161
## epsilon (gene 1): -0.172832
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -7.5
## LStheta (batch 1): -1.7
## ------------------------------------------------------------
## Iteration 1320 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 364.137
## delta (gene 1): 10.9956
## s (cell 1): 1.54537
## nu (cell 1): 1.09236
## theta (batch 1): 0.0383479
## betas:    1.0542  -0.2037  -0.9066   0.2843  -0.6868   1.6750   1.5383   0.2644   1.9826   0.1503   
##
## sigma: 0.248577
## lambda (gene 1): 0.493079
## epsilon (gene 1): 0.411262
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -7.4
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
```

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## Iteration 1360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 532.62
## delta (gene 1): 12.1727
## s (cell 1): 1.29791
## nu (cell 1): 1.05145
## theta (batch 1): 0.0119283
## betas:    0.9745  -0.1810  -0.4841  -0.3068   0.1581   1.7380   0.8041   1.4613   0.6379   1.2641  -(
##
## sigma: 0.255944
## lambda (gene 1): 1.22278
## epsilon (gene 1): 0.850597
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -7.3
## LStheta (batch 1): -1.7
## --------------------------------------------------------
## Iteration 1400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 659.178
## delta (gene 1): 10.4555
## s (cell 1): 1.08585
## nu (cell 1): 1.07544
## theta (batch 1): 0.0164387
## betas:    1.2368  -0.1171  -0.3827  -0.1218   0.0569   1.4120   0.9288   0.8691   1.0041   0.6426  -(
##
## sigma: 0.27431
## lambda (gene 1): 1.36107
## epsilon (gene 1): 0.605021
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -7.2
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 1440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 686.756
## delta (gene 1): 14.306
## s (cell 1): 0.960016
## nu (cell 1): 1.0177
## theta (batch 1): 0.0196224
## betas:    0.6480  -0.1828  -0.9861  -0.5431   0.2960   1.3475   1.7328   0.5730   1.7153   0.7588   (
##
## sigma: 0.249736
## lambda (gene 1): 0.623838
## epsilon (gene 1): 0.935055
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -7.2
## LStheta (batch 1): -1.6
## -----------------------------------------------------
## Iteration 1480 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 454.98
## delta (gene 1): 9.59838
## s (cell 1): 1.04118
## nu (cell 1): 1.0497
## theta (batch 1): 0.0149388
## betas:    1.0361  -0.0754  -0.8094  -0.2835   0.2216   1.0801   1.5333   0.6628   0.7405   1.2472  -
##
## sigma: 0.258882
## lambda (gene 1): 2.14096
## epsilon (gene 1): 0.196905
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -7.1
## LStheta (batch 1): -1.5
## -----------------------------------------------------
## Iteration 1520 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 472.361
## delta (gene 1): 9.56565
## s (cell 1): 0.995217
## nu (cell 1): 0.988332
## theta (batch 1): 0.0065879
## betas:    0.9761  -0.1118  -0.7261  -0.8397   0.3451   1.2173   1.4291   0.6896   1.1257   0.9364  -
##
## sigma: 0.259972
## lambda (gene 1): 1.67819
## epsilon (gene 1): 0.389891
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -7
## LStheta (batch 1): -1.6
## -----------------------------------------------------
## Iteration 1560 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 446.404
## delta (gene 1): 10.0281
## s (cell 1): 1.29393
## nu (cell 1): 1.02805
## theta (batch 1): 0.0349765
```

```
## betas:     0.6044  -0.0834  -0.1267  -0.1796   0.2832   1.5936   1.4484   0.6100   1.6703   0.2095   (
##
## sigma: 0.256315
## lambda (gene 1): 2.65922
## epsilon (gene 1): -0.0817178
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -6.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 1600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 293.027
## delta (gene 1): 9.63418
## s (cell 1): 1.75213
## nu (cell 1): 1.05111
## theta (batch 1): 0.0820902
## betas:     0.6447  -0.1375  -0.1189  -0.6983   0.4876   1.5721   1.2135   0.9617   1.2803   1.1263  -(
##
## sigma: 0.268905
## lambda (gene 1): 0.395248
## epsilon (gene 1): -0.129567
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.8
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 1640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 463.24
## delta (gene 1): 8.7595
## s (cell 1): 1.02113
## nu (cell 1): 1.03429
## theta (batch 1): 0.0869522
## betas:     1.4779  -0.2354  -0.7720  -0.9039  -0.2212   1.5591   0.3624   1.5399   0.7054   0.9656   (
##
## sigma: 0.239035
## lambda (gene 1): 0.790575
## epsilon (gene 1): -0.208637
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.8
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 1680 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 664.772
## delta (gene 1): 12.0748
## s (cell 1): 0.884938
## nu (cell 1): 1.04803
## theta (batch 1): 0.123931
## betas:    1.4150  -0.1916  -0.3716  -0.7066  -0.0668   1.1133   1.2444   0.6582   1.0213   1.0488  -(
##
## sigma: 0.269025
## lambda (gene 1): 0.994375
## epsilon (gene 1): 0.187752
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -6.7
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 1720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 268.419
## delta (gene 1): 8.58488
## s (cell 1): 0.785578
## nu (cell 1): 1.04799
## theta (batch 1): 0.0454115
## betas:    1.3658  -0.0644  -0.4793  -0.1457   0.4818   1.0971   1.1442   0.6003   0.8456   0.6028  -:
##
## sigma: 0.247762
## lambda (gene 1): 0.348685
## epsilon (gene 1): 0.45158
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 1760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 768.282
## delta (gene 1): 9.53633
## s (cell 1): 1.22309
## nu (cell 1): 1.08211
## theta (batch 1): 0.0205463
## betas:    0.9896  -0.1458   0.3122  -0.4502   0.0265   1.3306   1.3541   0.7167   1.1796   1.0438  -(
##
## sigma: 0.251691
## lambda (gene 1): 0.318113
## epsilon (gene 1): 0.621646
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
```

```
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -6.5
## LStheta (batch 1): -1.7
## ----------------------------------------------------------
## Iteration 1800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 740.744
## delta (gene 1): 8.84772
## s (cell 1): 1.00937
## nu (cell 1): 1.02094
## theta (batch 1): 0.0458634
## betas:    1.2290  -0.2144  -0.4243  -0.3655   0.5564   0.6557   1.2213   1.2038   0.6946   1.2220   (
##
## sigma: 0.26573
## lambda (gene 1): 1.08027
## epsilon (gene 1): 0.471302
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -6.4
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 1840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 529.722
## delta (gene 1): 11.2479
## s (cell 1): 1.05116
## nu (cell 1): 1.09079
## theta (batch 1): 0.0348429
## betas:    1.3456  -0.2607  -0.6363  -0.4187  -0.2980   1.3435   1.1716   0.9498   1.0349   1.2742  -(
##
## sigma: 0.253267
## lambda (gene 1): 0.224063
## epsilon (gene 1): 0.75436
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -6.4
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 1880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 467.27
## delta (gene 1): 8.84983
## s (cell 1): 1.08668
## nu (cell 1): 1.03066
## theta (batch 1): 0.0101972
## betas:    0.9804  -0.1352  -0.5763  -0.4810   0.9629   0.8163   1.5207   0.9123   0.8178   1.1191  -(
##
```

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## sigma: 0.24884
## lambda (gene 1): 1.73914
## epsilon (gene 1): 0.359958
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -6.3
## LStheta (batch 1): -1.5
## ------------------------------------------------------
## Iteration 1920 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 514.993
## delta (gene 1): 10.6461
## s (cell 1): 1.04581
## nu (cell 1): 1.12324
## theta (batch 1): 0.0599593
## betas:    1.1312  -0.1521  -0.8295  -0.2775  -0.1652   2.4175   0.3180   1.1640   1.1618   0.4887  -(
##
## sigma: 0.259353
## lambda (gene 1): 1.45991
## epsilon (gene 1): 0.760244
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.2
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 1960 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 404.975
## delta (gene 1): 10.1033
## s (cell 1): 0.977628
## nu (cell 1): 1.04004
## theta (batch 1): 0.0902719
## betas:    1.0100  -0.1283  -0.2287  -0.7995   0.6119   1.1500   1.3597   0.8389   1.0171   0.9097  -(
##
## sigma: 0.252787
## lambda (gene 1): 1.99476
## epsilon (gene 1): 0.419862
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -6.1
## LStheta (batch 1): -1.7
## ------------------------------------------------------
## Iteration 2000 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.416
```

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## delta (gene 1): 12.0462
## s (cell 1): 0.880605
## nu (cell 1): 1.02932
## theta (batch 1): 0.0647511
## betas:    1.1307  -0.1627  -0.5617  -0.5200   0.2300   0.8622   1.7962   0.2876   1.4224   0.8589  -(
##
## sigma: 0.278965
## lambda (gene 1): 0.45719
## epsilon (gene 1): 0.0110703
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 2040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 333.122
## delta (gene 1): 11.4465
## s (cell 1): 0.800339
## nu (cell 1): 1.02177
## theta (batch 1): 0.0496527
## betas:    0.7697  -0.2513  -0.7085  -0.1507   0.0950   1.5617   1.3678   0.9763   1.5098   0.8694  (
##
## sigma: 0.244685
## lambda (gene 1): 2.25818
## epsilon (gene 1): 0.0181077
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 2080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 621.398
## delta (gene 1): 10.6225
## s (cell 1): 1.0854
## nu (cell 1): 0.995338
## theta (batch 1): 0.076517
## betas:    0.4362  -0.2081  -0.2026  -0.5145   0.4654   1.5634   1.4307   1.0381   1.7301   0.7112  (
##
## sigma: 0.264145
## lambda (gene 1): 1.28151
## epsilon (gene 1): 0.213931
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.9
```

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## LStheta (batch 1): -1.7
## --------------------------------------------------------
## Iteration 2120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 505.146
## delta (gene 1): 9.42191
## s (cell 1): 1.37904
## nu (cell 1): 1.06272
## theta (batch 1): 0.0316757
## betas:    1.3989  -0.2411  -1.2453   0.2721   0.3146   0.8150   1.3899   0.7216   1.2776   0.5962
##
## sigma: 0.266187
## lambda (gene 1): 1.28357
## epsilon (gene 1): 0.609856
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.8
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 2160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 500.153
## delta (gene 1): 8.54507
## s (cell 1): 1.21147
## nu (cell 1): 1.1024
## theta (batch 1): 0.0830615
## betas:    1.6185  -0.2422   0.0299  -0.4447  -0.1230   1.0234   1.0527   0.8826   0.9532   0.8952
##
## sigma: 0.270077
## lambda (gene 1): 1.56408
## epsilon (gene 1): 0.264042
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.7
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 2200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 450.96
## delta (gene 1): 18.0984
## s (cell 1): 0.827589
## nu (cell 1): 1.05139
## theta (batch 1): 0.0577471
## betas:    1.6195  -0.1848   0.0082  -0.6871   0.7066   0.7153   1.2200   0.5599   1.1432   0.4575
##
## sigma: 0.279917
## lambda (gene 1): 0.550541
```

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## epsilon (gene 1): 0.825596
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 2240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 460.703
## delta (gene 1): 13.5048
## s (cell 1): 1.05095
## nu (cell 1): 1.05679
## theta (batch 1): 0.0362314
## betas:     1.0187  -0.2425   0.2521  -0.2207   0.1402   1.5718   1.1744   0.7925   1.6698   0.5545   (
##
## sigma: 0.259978
## lambda (gene 1): 0.717205
## epsilon (gene 1): 0.576799
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 2280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 291.49
## delta (gene 1): 13.1534
## s (cell 1): 0.754134
## nu (cell 1): 1.01529
## theta (batch 1): 0.0704154
## betas:     1.4976  -0.2780  -0.0232  -0.2196   0.0090   0.9012   1.1717   1.0733   0.7773   1.4093  -(
##
## sigma: 0.254979
## lambda (gene 1): 2.06384
## epsilon (gene 1): 0.376089
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.5
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 2320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 458.884
## delta (gene 1): 9.51478
## s (cell 1): 1.08853
```

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## nu (cell 1): 1.08305
## theta (batch 1): 0.0123227
## betas:    0.9009  -0.3189   0.3333  -0.2054  -0.0151   1.0979   1.7417   0.7817   1.5734   1.3537  -(
##
## sigma: 0.255231
## lambda (gene 1): 2.46788
## epsilon (gene 1): 0.0873581
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 2360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 750.169
## delta (gene 1): 11.2049
## s (cell 1): 0.826035
## nu (cell 1): 1.09039
## theta (batch 1): 0.0418383
## betas:    1.3388  -0.2217   0.5088   0.5300  -1.0314   1.5484   0.8254   1.2157   0.9193   0.9055  -(
##
## sigma: 0.250137
## lambda (gene 1): 0.5633
## epsilon (gene 1): 0.356021
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 2400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 646.2
## delta (gene 1): 11.7257
## s (cell 1): 1.1858
## nu (cell 1): 1.10188
## theta (batch 1): 0.0493332
## betas:    1.5478  -0.3497   0.1134  -0.3949  -0.1211   0.8363   1.3880   0.6557   1.3426   1.2948  -(
##
## sigma: 0.270207
## lambda (gene 1): 2.14212
## epsilon (gene 1): 0.142723
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
```

```
## Iteration 2440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 458.178
## delta (gene 1): 9.4005
## s (cell 1): 1.00255
## nu (cell 1): 1.06323
## theta (batch 1): 0.0185471
## betas:    1.2552  -0.2917  -0.7999   0.4664   0.3350   0.6361   1.5023   0.8874   1.1996   1.1279   (
##
## sigma: 0.258372
## lambda (gene 1): 1.92098
## epsilon (gene 1): -0.0514423
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 2480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 773.096
## delta (gene 1): 12.3045
## s (cell 1): 0.886372
## nu (cell 1): 1.0013
## theta (batch 1): 0.0166481
## betas:    1.4138  -0.2291   0.2216  -0.3915  -0.2853   1.0575   1.6472  -0.0204   2.0958   0.1262   (
##
## sigma: 0.258126
## lambda (gene 1): 1.18515
## epsilon (gene 1): -0.161966
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 2520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 495.962
## delta (gene 1): 12.6272
## s (cell 1): 0.995588
## nu (cell 1): 1.02793
## theta (batch 1): 0.0275249
## betas:    1.3978  -0.2649  -0.6000  -0.6860   0.5446   0.8093   1.2551   0.9716   0.9709   1.1398   -(
##
## sigma: 0.263083
## lambda (gene 1): 1.75818
## epsilon (gene 1): 0.487491
## ---------------------------------------------------------
```

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## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 2560 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.911
## delta (gene 1): 11.3774
## s (cell 1): 0.577446
## nu (cell 1): 1.04973
## theta (batch 1): 0.0869977
## betas:    1.1019  -0.2073  -0.9461  -0.3472  -0.0303   1.9602   0.7398   1.1023   1.1449   0.9760  -(
##
## sigma: 0.262777
## lambda (gene 1): 1.0616
## epsilon (gene 1): 0.339409
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.7
## ------------------------------------------------------
## Iteration 2600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 620.305
## delta (gene 1): 11.1002
## s (cell 1): 1.11209
## nu (cell 1): 1.02255
## theta (batch 1): 0.0759421
## betas:    1.1019  -0.2553  -0.2656  -0.1765  -0.1547   1.1453   1.4381   0.6687   1.5706   0.7726   (
##
## sigma: 0.278025
## lambda (gene 1): 0.948452
## epsilon (gene 1): 0.65933
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 2640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 608.877
## delta (gene 1): 10.968
## s (cell 1): 1.4667
## nu (cell 1): 1.07516
## theta (batch 1): 0.060227
```

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## betas:    0.5174  -0.2419   0.4109  -0.2129   0.1151   1.4130   1.4951   0.9704   1.6958   0.9419   (
##
## sigma: 0.254383
## lambda (gene 1): 0.578107
## epsilon (gene 1): 0.633097
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 2680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 471.657
## delta (gene 1): 12.4054
## s (cell 1): 1.19869
## nu (cell 1): 1.07138
## theta (batch 1): 0.0331413
## betas:    0.8266  -0.1544  -0.5616   0.3457   0.8046   0.4031   1.8073   0.8618   1.0904   1.0675  -(
##
## sigma: 0.267905
## lambda (gene 1): 0.593239
## epsilon (gene 1): 0.113158
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 2720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 406.234
## delta (gene 1): 11.7024
## s (cell 1): 0.546886
## nu (cell 1): 1.00186
## theta (batch 1): 0.12694
## betas:    1.0369  -0.2435  -0.8506  -0.3174   0.6044   0.7154   1.4565   1.1022   0.9345   1.4398  -(
##
## sigma: 0.262135
## lambda (gene 1): 0.961874
## epsilon (gene 1): 0.507114
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 2760 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 447.589
## delta (gene 1): 10.6184
## s (cell 1): 1.17944
## nu (cell 1): 1.09163
## theta (batch 1): 0.0713373
## betas:   -0.0351  -0.1014  -0.1851   0.8116   0.2327   1.6055   1.8647   0.9035   1.6183   0.8876   (
##
## sigma: 0.27043
## lambda (gene 1): 1.28784
## epsilon (gene 1): 0.365724
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 2800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 594.936
## delta (gene 1): 9.54897
## s (cell 1): 0.963779
## nu (cell 1): 1.04074
## theta (batch 1): 0.0382469
## betas:    0.3959  -0.1390  -0.3079   0.0154   0.6621   1.3262   1.2386   1.5087   0.8080   1.4015   -(
##
## sigma: 0.286158
## lambda (gene 1): 0.431434
## epsilon (gene 1): 0.714964
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 2840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.613
## delta (gene 1): 8.59768
## s (cell 1): 0.947971
## nu (cell 1): 1.11538
## theta (batch 1): 0.0164284
## betas:    1.1229  -0.2597  -0.8502  -0.3068   0.1468   0.9766   1.5529   0.7264   1.3731   1.1381   -(
##
## sigma: 0.261755
## lambda (gene 1): 0.768663
## epsilon (gene 1): 0.67063
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
```

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## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 2880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 653.353
## delta (gene 1): 7.80853
## s (cell 1): 1.49752
## nu (cell 1): 1.08535
## theta (batch 1): 0.0400204
## betas:    1.1014  -0.3031  -0.6495  -0.4983   0.3207   1.1265   1.3297   0.8697   1.5970   0.8751  (
##
## sigma: 0.261935
## lambda (gene 1): 0.551915
## epsilon (gene 1): -0.462622
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 2920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 484.527
## delta (gene 1): 10.4901
## s (cell 1): 0.827817
## nu (cell 1): 1.03766
## theta (batch 1): 0.0769393
## betas:    0.9241  -0.1303  -0.2059   0.4061  -0.1870   1.4952   1.3921   0.7675   1.0651   1.1082  -(
##
## sigma: 0.260149
## lambda (gene 1): 2.20343
## epsilon (gene 1): 0.486142
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 2960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 543.247
## delta (gene 1): 9.55616
## s (cell 1): 1.18732
## nu (cell 1): 1.08843
## theta (batch 1): 0.0577749
## betas:    1.2521  -0.2691  -0.8424  -0.1267  -0.1326   1.1417   1.2043   1.0354   0.9880   1.2393  (
##
```

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## sigma: 0.260273
## lambda (gene 1): 0.822534
## epsilon (gene 1): 0.265472
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 3000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 376.88
## delta (gene 1): 9.5985
## s (cell 1): 0.971719
## nu (cell 1): 1.05984
## theta (batch 1): 0.0169677
## betas:    1.7937  -0.1979  -1.1796  -0.0220   0.1154   0.6822   1.1092   0.7335   0.8368   0.8203  -(
##
## sigma: 0.277784
## lambda (gene 1): 1.20981
## epsilon (gene 1): 0.0434899
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 3040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 419.679
## delta (gene 1): 13.5098
## s (cell 1): 0.97882
## nu (cell 1): 1.00299
## theta (batch 1): 0.0156111
## betas:    0.3022  -0.1801   0.1965   0.5179   0.1680   1.4247   1.4567   1.2862   1.3297   1.1793   (
##
## sigma: 0.258035
## lambda (gene 1): 0.581792
## epsilon (gene 1): 0.417238
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 3080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 487.963
```

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## delta (gene 1): 8.12457
## s (cell 1): 0.97204
## nu (cell 1): 1.01496
## theta (batch 1): 0.0399354
## betas:    1.3014  -0.1853   0.4453  -1.5891   0.3843   1.2243   1.3477   0.5668   1.2048   0.9463  -(
##
## sigma: 0.274938
## lambda (gene 1): 1.84327
## epsilon (gene 1): -0.0235991
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## --------------------------------------------------------
## Iteration 3120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 713.723
## delta (gene 1): 9.50861
## s (cell 1): 1.13034
## nu (cell 1): 1.03998
## theta (batch 1): 0.0252676
## betas:    0.7985  -0.2166  -0.4581  -0.4431   0.5728   1.1239   1.4715   0.8516   1.4163   1.0137   (
##
## sigma: 0.253307
## lambda (gene 1): 2.08656
## epsilon (gene 1): 0.131969
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 3160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 504.345
## delta (gene 1): 8.91491
## s (cell 1): 1.27791
## nu (cell 1): 1.02721
## theta (batch 1): 0.0174957
## betas:    0.6729  -0.2339   0.5707  -0.6879   0.5543   1.0120   1.4141   1.0850   1.5609   0.6349   (
##
## sigma: 0.25983
## lambda (gene 1): 0.36537
## epsilon (gene 1): 0.187769
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
```

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## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 3200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 640.248
## delta (gene 1): 9.64755
## s (cell 1): 1.18814
## nu (cell 1): 0.98036
## theta (batch 1): 0.0266312
## betas:    0.8820  -0.1030   0.4021  -0.0731   0.8226   1.0821   1.2555   1.0244   0.8219   1.0725  -(
##
## sigma: 0.288046
## lambda (gene 1): 1.11252
## epsilon (gene 1): 0.494686
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 3240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 563.822
## delta (gene 1): 11.3603
## s (cell 1): 1.09142
## nu (cell 1): 1.12294
## theta (batch 1): 0.0571623
## betas:    1.7331  -0.3263  -0.4394  -0.3489   0.0202   0.8792   1.0253   1.0078   0.9438   1.2281  -(
##
## sigma: 0.262516
## lambda (gene 1): 1.19513
## epsilon (gene 1): 0.696213
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 3280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 519.683
## delta (gene 1): 9.74032
## s (cell 1): 1.1649
## nu (cell 1): 1.00299
## theta (batch 1): 0.058469
## betas:    1.7512  -0.2698  -0.0188  -0.4594  -0.1226   1.6716   0.3605   1.2478   0.9071   0.5801   (
##
## sigma: 0.262987
## lambda (gene 1): 0.658215
```

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## epsilon (gene 1): -0.082034
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ------------------------------------------------------
## Iteration 3320 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 642.937
## delta (gene 1): 8.57865
## s (cell 1): 1.07811
## nu (cell 1): 1.02696
## theta (batch 1): 0.0828778
## betas:    0.9263  -0.2225   0.5948   0.0353  -0.1178   1.2043   1.2430   1.0626   1.4011   0.6733
##
## sigma: 0.268341
## lambda (gene 1): 2.00089
## epsilon (gene 1): -0.0398843
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.2
## ------------------------------------------------------
## Iteration 3360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 349.014
## delta (gene 1): 11.5102
## s (cell 1): 1.0494
## nu (cell 1): 1.05836
## theta (batch 1): 0.0317677
## betas:    1.8000  -0.2558   0.2674  -0.3645  -0.5488   1.4023   0.9444   0.6202   1.1798   0.6390  -(
##
## sigma: 0.252442
## lambda (gene 1): 1.61967
## epsilon (gene 1): 0.818391
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.1
## ------------------------------------------------------
## Iteration 3400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 624.249
## delta (gene 1): 10.2707
## s (cell 1): 1.05952
```

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## nu (cell 1): 1.13647
## theta (batch 1): 0.0235268
## betas:    1.2193  -0.2471   0.1442   0.1864  -0.1035   1.0204   1.6634   0.4788   1.4036   0.9651  -(
##
## sigma: 0.282141
## lambda (gene 1): 0.80035
## epsilon (gene 1): 0.533205
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## -------------------------------------------------------
## Iteration 3440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 394.358
## delta (gene 1): 10.0396
## s (cell 1): 0.877003
## nu (cell 1): 1.00821
## theta (batch 1): 0.0373278
## betas:    0.5817  -0.2587   0.9164  -0.1794  -0.1897   2.0969   0.7219   1.7359   1.1379   1.2665   (
##
## sigma: 0.247936
## lambda (gene 1): 1.51517
## epsilon (gene 1): 0.587324
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## -------------------------------------------------------
## Iteration 3480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.987
## delta (gene 1): 13.0182
## s (cell 1): 1.04911
## nu (cell 1): 1.08989
## theta (batch 1): 0.0536701
## betas:    1.3122  -0.2397   0.0293  -0.1392  -0.3211   1.3610   0.7676   1.3118   1.0665   0.4696   (
##
## sigma: 0.266796
## lambda (gene 1): 0.870036
## epsilon (gene 1): 0.628791
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.3
## -------------------------------------------------------
```

```
## Iteration 3520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.156
## delta (gene 1): 13.2345
## s (cell 1): 0.983218
## nu (cell 1): 1.09195
## theta (batch 1): 0.0276129
## betas:    1.4712  -0.2310   0.2199  -0.1076  -0.7604   1.1438   1.6315   0.4515   1.0875   1.1315  -(
##
## sigma: 0.261886
## lambda (gene 1): 0.884261
## epsilon (gene 1): 0.817358
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## ---------------------------------------------------------
## Iteration 3560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 488.55
## delta (gene 1): 11.1114
## s (cell 1): 0.75438
## nu (cell 1): 1.01718
## theta (batch 1): 0.0221607
## betas:    1.2021  -0.1931   0.2521   0.5962  -0.8785   1.8913   1.0344   0.6758   1.4427   0.5511  -(
##
## sigma: 0.267781
## lambda (gene 1): 1.247
## epsilon (gene 1): 0.519277
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 3600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 424.982
## delta (gene 1): 10.3675
## s (cell 1): 1.05822
## nu (cell 1): 1.06902
## theta (batch 1): 0.00713147
## betas:    1.0881  -0.1615   0.3760  -0.2560   0.5030   1.0561   1.1649   1.1946   0.6110   1.4434  -(
##
## sigma: 0.297451
## lambda (gene 1): 1.22061
## epsilon (gene 1): 0.213898
## ---------------------------------------------------------
```

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## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.2
## ------------------------------------------------------
## Iteration 3640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 749.158
## delta (gene 1): 12.0982
## s (cell 1): 1.07092
## nu (cell 1): 1.1199
## theta (batch 1): 0.0173068
## betas:    1.6482  -0.3158   0.1217  -0.7145   0.8854   0.2197   1.2897   1.1601   0.6597   1.4434  -(
##
## sigma: 0.269751
## lambda (gene 1): 1.09175
## epsilon (gene 1): 0.415333
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.2
## ------------------------------------------------------
## Iteration 3680 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 462.923
## delta (gene 1): 12.1234
## s (cell 1): 1.15147
## nu (cell 1): 1.00613
## theta (batch 1): 0.0139978
## betas:    1.3486  -0.2088   1.1533   0.0913  -0.2853   0.5475   1.6282   0.6823   1.0744   1.0737  -(
##
## sigma: 0.265751
## lambda (gene 1): 0.806682
## epsilon (gene 1): 0.385575
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## ------------------------------------------------------
## Iteration 3720 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 456.774
## delta (gene 1): 12.572
## s (cell 1): 0.985299
## nu (cell 1): 1.06878
## theta (batch 1): 0.0099928
```

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## betas:    1.2154  -0.3025   0.4121   0.3302  -0.1646   1.0766   1.3377   0.9612   1.2842   1.2674  -(
##
## sigma: 0.263522
## lambda (gene 1): 0.834748
## epsilon (gene 1): 0.424964
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.2
## ------------------------------------------------------
## Iteration 3760 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 417.007
## delta (gene 1): 9.32144
## s (cell 1): 1.03586
## nu (cell 1): 1.04748
## theta (batch 1): 0.00780922
## betas:    1.6742  -0.3139   0.7555   0.4894  -0.9992   0.9389   1.2399   0.7910   1.0999   1.1378  -(
##
## sigma: 0.256002
## lambda (gene 1): 0.484112
## epsilon (gene 1): 0.241728
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ------------------------------------------------------
## Iteration 3800 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 447.448
## delta (gene 1): 11.631
## s (cell 1): 1.07638
## nu (cell 1): 1.07893
## theta (batch 1): 0.0042547
## betas:    1.8402  -0.2506   0.1547  -0.0120  -0.2501   0.3766   1.4055   0.5722   1.0532   0.6484   (
##
## sigma: 0.277944
## lambda (gene 1): 0.19539
## epsilon (gene 1): 0.398982
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ------------------------------------------------------
## Iteration 3840 out of 40000 has been completed.
## ------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 616.757
## delta (gene 1): 10.5444
## s (cell 1): 1.08207
## nu (cell 1): 1.07132
## theta (batch 1): 0.0084073
## betas:    1.4411  -0.2481   0.0384  -0.3092   0.2321   0.8653   1.3120   0.7780   1.2073   0.8603  -(
##
## sigma: 0.255173
## lambda (gene 1): 1.56422
## epsilon (gene 1): 0.32173
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 3880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 514.365
## delta (gene 1): 11.9513
## s (cell 1): 1.08248
## nu (cell 1): 1.12773
## theta (batch 1): 0.0293831
## betas:    1.2379  -0.2600   0.1982  -0.1316  -0.7085   1.7150   1.0504   0.8401   1.4821   0.8374  -(
##
## sigma: 0.248451
## lambda (gene 1): 0.817246
## epsilon (gene 1): 0.480691
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 3920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 518.144
## delta (gene 1): 9.01002
## s (cell 1): 1.07107
## nu (cell 1): 1.0989
## theta (batch 1): 0.0140715
## betas:    1.6688  -0.3469  -0.2409  -0.8279   0.5231   0.3533   1.4518   0.8127   1.2734   0.7673   (
##
## sigma: 0.254063
## lambda (gene 1): 1.98589
## epsilon (gene 1): -0.113433
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
```

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## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 3960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 379.412
## delta (gene 1): 11.5668
## s (cell 1): 1.14239
## nu (cell 1): 1.0743
## theta (batch 1): 0.00480426
## betas:    1.3702  -0.3413  -0.7048  -0.6351   0.4144   0.9384   1.2392   0.8509   1.5654   0.9559  -0
##
## sigma: 0.269832
## lambda (gene 1): 0.191491
## epsilon (gene 1): 0.423392
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 4000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 500.79
## delta (gene 1): 11.0552
## s (cell 1): 1.09712
## nu (cell 1): 1.18269
## theta (batch 1): 0.0103654
## betas:    0.9251  -0.2447   0.1658  -0.3047   0.3311   1.1581   1.3916   0.8412   1.6198   0.6639   (
##
## sigma: 0.294176
## lambda (gene 1): 1.5065
## epsilon (gene 1): 0.471641
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 4040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 448.153
## delta (gene 1): 12.1986
## s (cell 1): 1.00079
## nu (cell 1): 1.02385
## theta (batch 1): 0.0310296
## betas:    0.7337  -0.0551   0.2907  -0.0548   1.1367   0.7395   1.4060   1.2064   0.4886   1.3786  -
##
```

```
## sigma: 0.265392
## lambda (gene 1): 0.463019
## epsilon (gene 1): 0.555412
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 4080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 585.933
## delta (gene 1): 10.7971
## s (cell 1): 0.884814
## nu (cell 1): 1.06525
## theta (batch 1): 0.0342821
## betas:    1.4655  -0.1850   0.6485  -0.5824  -0.4440   2.0099   0.4000   1.1020   1.0493   0.5293  -0
##
## sigma: 0.265423
## lambda (gene 1): 1.27078
## epsilon (gene 1): -0.13469
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 4120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 868.004
## delta (gene 1): 12.5089
## s (cell 1): 0.819763
## nu (cell 1): 1.06493
## theta (batch 1): 0.0701592
## betas:    1.5461  -0.2258  -0.2135  -0.7066   0.1831   1.2676   0.8191   1.0244   0.9056   0.9270  -0
##
## sigma: 0.261597
## lambda (gene 1): 0.324106
## epsilon (gene 1): 0.626262
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 4160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 413.538
```

```
## delta (gene 1): 11.3643
## s (cell 1): 1.00925
## nu (cell 1): 1.09639
## theta (batch 1): 0.0377931
## betas:    1.0552  -0.2017   0.4196  -0.7892   0.5988   1.2207   1.2273   0.6452   1.7844   0.2194  (
##
## sigma: 0.264776
## lambda (gene 1): 0.170121
## epsilon (gene 1): 0.341952
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## --------------------------------------------------------
## Iteration 4200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 435.99
## delta (gene 1): 8.6954
## s (cell 1): 1.19391
## nu (cell 1): 1.08343
## theta (batch 1): 0.0180732
## betas:    1.1625  -0.2798  -0.4691  -0.3694   0.1554   1.1532   1.2431   0.8645   1.4564   0.8930  (
##
## sigma: 0.279633
## lambda (gene 1): 1.90917
## epsilon (gene 1): 0.0417082
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 4240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 334.35
## delta (gene 1): 14.7201
## s (cell 1): 1.54682
## nu (cell 1): 0.999646
## theta (batch 1): 0.06165
## betas:    1.5417  -0.2589  -0.1122  -0.2878  -0.9161   1.5792   1.0407   0.6687   1.4730   0.3360  (
##
## sigma: 0.270494
## lambda (gene 1): 1.07735
## epsilon (gene 1): 0.606828
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 4280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.302
## delta (gene 1): 11.2231
## s (cell 1): 1.07253
## nu (cell 1): 1.05959
## theta (batch 1): 0.030799
## betas:    1.2907  -0.2008  -0.3487  -0.1075   0.1204   0.9315   1.1242   0.9784   1.1767   0.6218   (
##
## sigma: 0.267918
## lambda (gene 1): 0.403785
## epsilon (gene 1): 0.129066
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 4320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 446.21
## delta (gene 1): 9.81321
## s (cell 1): 0.983497
## nu (cell 1): 1.05331
## theta (batch 1): 0.025193
## betas:    1.7595  -0.1858  -0.2441  -0.4318  -0.1356   0.9946   0.9988   0.7577   0.8790   0.6862  -(
##
## sigma: 0.258006
## lambda (gene 1): 1.80022
## epsilon (gene 1): 0.252362
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 4360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 677.796
## delta (gene 1): 10.5242
## s (cell 1): 1.02746
## nu (cell 1): 1.04977
## theta (batch 1): 0.0219874
## betas:    1.3986  -0.2656  -0.1141  -0.5567   0.4529   0.7844   1.2608   0.9895   0.9387   1.3158  -(
##
## sigma: 0.248228
## lambda (gene 1): 0.177905
```

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## epsilon (gene 1): 0.368192
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 4400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 439.478
## delta (gene 1): 16.7363
## s (cell 1): 0.996254
## nu (cell 1): 1.01657
## theta (batch 1): 0.00860945
## betas:    1.3699  -0.2071   0.3494   0.4861  -0.3803   1.1372   1.0249   1.0724   0.9041   0.9137   (
##
## sigma: 0.294165
## lambda (gene 1): 1.11998
## epsilon (gene 1): 0.734647
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 4440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 323.684
## delta (gene 1): 7.82482
## s (cell 1): 1.37697
## nu (cell 1): 1.08818
## theta (batch 1): 0.0272491
## betas:    1.0793  -0.2917  -0.0727   0.7659  -0.3386   0.3392   1.9782   0.6379   1.5103   1.0765   (
##
## sigma: 0.255151
## lambda (gene 1): 2.36475
## epsilon (gene 1): -0.0103331
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 4480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 551.333
## delta (gene 1): 12.3572
## s (cell 1): 1.08169
```

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## nu (cell 1): 1.07544
## theta (batch 1): 0.00897318
## betas:    1.3802  -0.3645   0.0767  -0.2646  -0.2981   1.4146   1.0337   0.9634   1.7295   0.4547   (
##
## sigma: 0.25688
## lambda (gene 1): 1.84157
## epsilon (gene 1): 0.505101
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## ------------------------------------------------------------
## Iteration 4520 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 549.977
## delta (gene 1): 8.7797
## s (cell 1): 0.690532
## nu (cell 1): 0.991123
## theta (batch 1): 0.052847
## betas:    2.1515  -0.2464  -0.3118   0.0332  -0.5887   1.2346   0.4977   0.8918   0.9177   0.3433   -(
##
## sigma: 0.256581
## lambda (gene 1): 2.53747
## epsilon (gene 1): 0.440336
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ------------------------------------------------------------
## Iteration 4560 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 573.419
## delta (gene 1): 8.31946
## s (cell 1): 1.14921
## nu (cell 1): 1.03151
## theta (batch 1): 0.0442575
## betas:    1.5706  -0.3580   0.4647  -0.2419  -0.6504   0.8893   1.6049   0.5111   1.7038   0.6302   (
##
## sigma: 0.260133
## lambda (gene 1): 0.384819
## epsilon (gene 1): 0.642995
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## ------------------------------------------------------------
```

```
## Iteration 4600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 412.153
## delta (gene 1): 10.2251
## s (cell 1): 1.10736
## nu (cell 1): 1.07732
## theta (batch 1): 0.0083716
## betas:    0.3443  -0.2370   0.3663   0.5569   0.2109   1.6971   0.9856   1.7799   1.0762   1.3232
##
## sigma: 0.294305
## lambda (gene 1): 0.604261
## epsilon (gene 1): 0.265642
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 4640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 487.51
## delta (gene 1): 10.8664
## s (cell 1): 1.42747
## nu (cell 1): 1.00676
## theta (batch 1): 0.0432204
## betas:    1.7384  -0.2922  -0.0773  -1.4278   0.9649   0.6372   0.8015   1.1918   0.8262   0.9509
##
## sigma: 0.264555
## lambda (gene 1): 1.56789
## epsilon (gene 1): 0.33421
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 4680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 525.297
## delta (gene 1): 10.3218
## s (cell 1): 1.31291
## nu (cell 1): 1.05928
## theta (batch 1): 0.0462523
## betas:    1.5275  -0.1629  -0.3269   0.3878  -0.2944   0.6146   1.6073   0.3137   1.2627   0.5811
##
## sigma: 0.273573
## lambda (gene 1): 1.37269
## epsilon (gene 1): 0.218925
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ------------------------------------------------------
## Iteration 4720 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 587.277
## delta (gene 1): 9.68333
## s (cell 1): 1.25402
## nu (cell 1): 1.082
## theta (batch 1): 0.0223835
## betas:    1.3966  -0.3043   0.4873  -0.4313  -0.2302   0.7258   1.6723   0.4170   1.6653   0.8901  -(
##
## sigma: 0.257112
## lambda (gene 1): 1.67611
## epsilon (gene 1): 0.00302692
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ------------------------------------------------------
## Iteration 4760 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 397.939
## delta (gene 1): 10.3458
## s (cell 1): 1.08949
## nu (cell 1): 1.09845
## theta (batch 1): 0.00399149
## betas:    1.2364  -0.1296   0.5393   0.0197   0.6010   0.8250   1.2490   0.8727   0.8509   0.8106  -(
##
## sigma: 0.269776
## lambda (gene 1): 0.485157
## epsilon (gene 1): 0.47427
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ------------------------------------------------------
## Iteration 4800 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.778
## delta (gene 1): 8.58065
## s (cell 1): 0.991587
## nu (cell 1): 1.03991
## theta (batch 1): 0.00208992
```

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## betas:    1.0728  -0.2234   0.3172  -0.2549   0.6478   0.8920   1.4995   0.5911   1.6742   0.5590   (
##
## sigma: 0.282972
## lambda (gene 1): 0.878506
## epsilon (gene 1): -0.0114766
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 4840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 585.193
## delta (gene 1): 12.2454
## s (cell 1): 1.13973
## nu (cell 1): 1.00462
## theta (batch 1): 0.0128153
## betas:    1.7528  -0.2929   0.3273  -0.0283  -0.6144   0.8922   1.3124   0.6006   1.1746   0.9057  -(
##
## sigma: 0.258891
## lambda (gene 1): 0.658865
## epsilon (gene 1): 0.370754
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 4880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 708.114
## delta (gene 1): 8.67552
## s (cell 1): 1.08601
## nu (cell 1): 1.1079
## theta (batch 1): 0.0152282
## betas:    2.0883  -0.3572   0.3092  -0.8036  -0.4335   0.7622   1.0381   0.6886   1.1889   0.8534   (
##
## sigma: 0.263231
## lambda (gene 1): 1.59656
## epsilon (gene 1): 0.580393
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 4920 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 461.304
## delta (gene 1): 10.5052
## s (cell 1): 1.13485
## nu (cell 1): 1.08796
## theta (batch 1): 0.00173614
## betas:    0.9669  -0.1966   1.2379  -0.0425  -0.3296   0.8476   1.9177   0.5478   1.2609   1.2602  -(
##
## sigma: 0.274924
## lambda (gene 1): 1.17279
## epsilon (gene 1): -0.0954979
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 4960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 400.734
## delta (gene 1): 11.4837
## s (cell 1): 1.01073
## nu (cell 1): 1.04843
## theta (batch 1): 0.008802
## betas:    1.8541  -0.2847   0.9139  -0.3812  -0.9117   1.2282   1.1347   0.4785   1.3568   0.6632  -(
##
## sigma: 0.263117
## lambda (gene 1): 0.796292
## epsilon (gene 1): 0.574259
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 5000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 624.583
## delta (gene 1): 7.15484
## s (cell 1): 1.15655
## nu (cell 1): 1.08572
## theta (batch 1): 0.0218904
## betas:    1.5279  -0.2867  -0.4589   0.0150   0.2719   0.5854   1.3343   0.8713   1.0514   1.2003  -(
##
## sigma: 0.275408
## lambda (gene 1): 0.917836
## epsilon (gene 1): 0.196249
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
```

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## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 5040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 343.912
## delta (gene 1): 12.0014
## s (cell 1): 1.33017
## nu (cell 1): 1.06757
## theta (batch 1): 0.0306991
## betas:    1.1252  -0.1536   0.5550  -0.0870   0.3904   1.0681   1.1183   1.0199   1.0401   0.7415  -(
##
## sigma: 0.249999
## lambda (gene 1): 0.465969
## epsilon (gene 1): 0.735322
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 5080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 813.611
## delta (gene 1): 9.95196
## s (cell 1): 1.13966
## nu (cell 1): 1.10084
## theta (batch 1): 0.0472635
## betas:    1.0902  -0.2726  -0.1443  -0.0630   0.6797   0.9030   1.0916   1.2555   1.3291   0.7019   (
##
## sigma: 0.25773
## lambda (gene 1): 1.36837
## epsilon (gene 1): 0.00597343
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 5120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 499.761
## delta (gene 1): 9.79246
## s (cell 1): 0.981276
## nu (cell 1): 0.996739
## theta (batch 1): 0.0157068
## betas:    1.1766  -0.2995  -0.2416  -0.2789  -0.3510   1.8307   0.7717   1.0742   1.5654   0.7894   (
##
```

```
## sigma: 0.265532
## lambda (gene 1): 0.485245
## epsilon (gene 1): 0.316723
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 5160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 544.099
## delta (gene 1): 7.61097
## s (cell 1): 0.960468
## nu (cell 1): 1.00885
## theta (batch 1): 0.0145283
## betas:    0.6119  -0.1871   0.6252   0.1149  -0.2232   1.2771   1.8573   0.6997   1.4170   1.1916  -(
##
## sigma: 0.265888
## lambda (gene 1): 1.03126
## epsilon (gene 1): -0.1086
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## ----------------------------------------------------------
## Iteration 5200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 545.374
## delta (gene 1): 8.87893
## s (cell 1): 1.0223
## nu (cell 1): 1.00246
## theta (batch 1): 0.00478614
## betas:    2.0958  -0.1541  -0.2469  -0.6249   0.0575   1.1770   0.2985   1.1377   0.2639   0.5807  -(
##
## sigma: 0.275116
## lambda (gene 1): 1.44474
## epsilon (gene 1): 0.252338
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 5240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 498.041
```

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## delta (gene 1): 12.2252
## s (cell 1): 1.15916
## nu (cell 1): 1.11982
## theta (batch 1): 0.00382128
## betas:    1.2050  -0.2636   0.0234  -0.0386  -0.0964   1.2300   1.4328   0.6301   1.3907   1.1450  -(
##
## sigma: 0.254523
## lambda (gene 1): 0.399934
## epsilon (gene 1): 0.59843
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 5280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 636.209
## delta (gene 1): 12.7897
## s (cell 1): 1.03257
## nu (cell 1): 1.03555
## theta (batch 1): 0.0105065
## betas:    0.7243  -0.1956   0.3620  -0.6886   0.9834   0.9937   1.5186   0.9975   1.3372   0.8257   (
##
## sigma: 0.275537
## lambda (gene 1): 0.695325
## epsilon (gene 1): 0.271638
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 5320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 569.353
## delta (gene 1): 8.18521
## s (cell 1): 1.29703
## nu (cell 1): 1.04106
## theta (batch 1): 0.0361299
## betas:    1.3449  -0.2321  -0.2105  -0.3099  -0.0780   0.8415   1.5093   0.6520   1.1650   1.1214  -(
##
## sigma: 0.25456
## lambda (gene 1): 1.61914
## epsilon (gene 1): 0.259912
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
```

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## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 5360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 531.407
## delta (gene 1): 9.54193
## s (cell 1): 0.958014
## nu (cell 1): 1.08819
## theta (batch 1): 0.0627336
## betas:    1.1574  -0.0541  -0.0018  -0.6969   0.6106   1.1197   0.8243   1.2763   0.4885   0.8767  -(
##
## sigma: 0.270295
## lambda (gene 1): 2.08802
## epsilon (gene 1): 0.216312
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## ----------------------------------------------------------
## Iteration 5400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 286.779
## delta (gene 1): 9.94119
## s (cell 1): 1.3274
## nu (cell 1): 1.09805
## theta (batch 1): 0.0630889
## betas:    0.6577  -0.2253  -0.5811   0.1322   0.1664   1.5183   1.4427   0.9377   1.4795   1.0011   (
##
## sigma: 0.281043
## lambda (gene 1): 1.56451
## epsilon (gene 1): 0.0286653
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 5440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.222
## delta (gene 1): 13.6217
## s (cell 1): 1.05553
## nu (cell 1): 1.121
## theta (batch 1): 0.0443134
## betas:    1.0146  -0.0990   0.0755  -0.0179   0.6037   0.9961   1.5644   0.6227   0.8641   1.2064  -1
##
## sigma: 0.259789
## lambda (gene 1): 0.562715
```

```
## epsilon (gene 1): 0.358539
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 5480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 481.468
## delta (gene 1): 7.76696
## s (cell 1): 1.39139
## nu (cell 1): 1.14827
## theta (batch 1): 0.0613345
## betas:    1.1255  -0.1933   0.4299  -0.2150   0.4488  -0.1015   2.3471   0.4772   1.0966   1.2030  -0
##
## sigma: 0.26192
## lambda (gene 1): 2.20715
## epsilon (gene 1): 0.242954
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 5520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 457.886
## delta (gene 1): 10.3259
## s (cell 1): 1.30834
## nu (cell 1): 1.10389
## theta (batch 1): 0.0384237
## betas:    1.3929  -0.2483   0.2981  -0.6382   0.2375   1.0797   1.2993   0.6866   1.2984   0.7707  -0
##
## sigma: 0.26277
## lambda (gene 1): 2.28886
## epsilon (gene 1): 0.603616
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 5560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 516.437
## delta (gene 1): 7.20583
## s (cell 1): 0.943845
```

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## nu (cell 1): 1.08786
## theta (batch 1): 0.0114895
## betas:     1.6001  -0.2557  -0.6241   0.0420  -0.3447   0.8573   1.4938   0.3248   1.4597   0.8297  -(
##
## sigma: 0.26272
## lambda (gene 1): 1.68695
## epsilon (gene 1): 0.045873
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## ----------------------------------------------------------
## Iteration 5600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 593.517
## delta (gene 1): 7.00642
## s (cell 1): 0.9493
## nu (cell 1): 1.07232
## theta (batch 1): 0.0329703
## betas:     0.9095  -0.3070  -0.5843   0.1694  -0.2402   1.0991   1.6219   0.8579   1.5092   1.3004   (
##
## sigma: 0.290341
## lambda (gene 1): 0.886622
## epsilon (gene 1): 0.138221
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 5640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 430.166
## delta (gene 1): 7.42069
## s (cell 1): 0.934076
## nu (cell 1): 1.06779
## theta (batch 1): 0.036134
## betas:     1.2789  -0.1834   0.1719  -0.6158   0.3646   1.1413   0.9312   0.9071   1.2265   0.6093   (
##
## sigma: 0.268477
## lambda (gene 1): 1.50228
## epsilon (gene 1): 0.21496
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
```

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## Iteration 5680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 463.281
## delta (gene 1): 9.65816
## s (cell 1): 1.10157
## nu (cell 1): 1.01478
## theta (batch 1): 0.0753062
## betas:    1.3274  -0.1895  -0.0836  -0.6374   0.4847   1.2591   0.9293   0.7606   1.4725   0.1185  (
##
## sigma: 0.257919
## lambda (gene 1): 1.51905
## epsilon (gene 1): 0.383571
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 5720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 592.331
## delta (gene 1): 9.06475
## s (cell 1): 0.906137
## nu (cell 1): 1.04667
## theta (batch 1): 0.0770094
## betas:    1.2256  -0.2333  -0.3473  -0.5858   0.2249   0.4091   1.6341   0.8247   1.1164   1.1676  -(
##
## sigma: 0.268895
## lambda (gene 1): 0.958581
## epsilon (gene 1): 0.501621
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 5760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.972
## delta (gene 1): 8.9206
## s (cell 1): 1.25592
## nu (cell 1): 1.04194
## theta (batch 1): 0.147299
## betas:    1.6827  -0.2593  -0.5684   0.4191  -1.0420   1.3363   0.9309   0.9242   1.0120   0.7981  -(
##
## sigma: 0.26955
## lambda (gene 1): 0.860311
## epsilon (gene 1): 0.510553
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ------------------------------------------------------
## Iteration 5800 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 955.152
## delta (gene 1): 9.8553
## s (cell 1): 0.680517
## nu (cell 1): 1.03163
## theta (batch 1): 0.0364578
## betas:    1.0690  -0.2644   0.0992  -0.0339  -0.2113   0.7373   1.6845   0.9937   0.9697   1.5684  -(
##
## sigma: 0.280321
## lambda (gene 1): 0.692371
## epsilon (gene 1): 0.882249
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ------------------------------------------------------
## Iteration 5840 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 585.589
## delta (gene 1): 8.25234
## s (cell 1): 0.92839
## nu (cell 1): 1.04479
## theta (batch 1): 0.0458573
## betas:    0.3488  -0.1897   0.3096   0.0427   0.1177   1.3686   1.7243   0.9780   1.4189   1.2949   (
##
## sigma: 0.258801
## lambda (gene 1): 0.976828
## epsilon (gene 1): 0.701159
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ------------------------------------------------------
## Iteration 5880 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 851.799
## delta (gene 1): 11.2052
## s (cell 1): 1.40891
## nu (cell 1): 1.0474
## theta (batch 1): 0.0943319
```

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## betas:     1.2002  -0.1373  -0.0909   0.1179  -0.1851   1.2483   1.4244   0.7034   0.9637   0.8123  -(
##
## sigma: 0.269154
## lambda (gene 1): 1.3687
## epsilon (gene 1): 0.487848
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 5920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 588.761
## delta (gene 1): 9.34387
## s (cell 1): 1.50809
## nu (cell 1): 1.08409
## theta (batch 1): 0.0480087
## betas:     1.4020  -0.3294  -0.4404  -0.9615  -0.1391   1.5226   1.0665   0.6826   1.8058   0.5618   (
##
## sigma: 0.256978
## lambda (gene 1): 1.15083
## epsilon (gene 1): 0.0720551
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 5960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 499.436
## delta (gene 1): 11.3811
## s (cell 1): 0.875426
## nu (cell 1): 1.06586
## theta (batch 1): 0.109444
## betas:     0.7947  -0.2101   0.2253  -0.3099   0.0323   1.5861   1.1489   1.0681   1.2962   1.1565  -(
##
## sigma: 0.270869
## lambda (gene 1): 0.872447
## epsilon (gene 1): 0.374925
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 6000 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 609.167
## delta (gene 1): 12.0132
## s (cell 1): 0.671482
## nu (cell 1): 1.02713
## theta (batch 1): 0.0726761
## betas:    0.5638  -0.1303   0.1130   0.2090   0.5002   1.0479   1.5865   1.1610   0.8474   1.3666  -(
##
## sigma: 0.268466
## lambda (gene 1): 2.23464
## epsilon (gene 1): 0.248456
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 6040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 448.909
## delta (gene 1): 12.1423
## s (cell 1): 0.926145
## nu (cell 1): 1.07346
## theta (batch 1): 0.0246122
## betas:    1.0123  -0.1059  -0.4813  -0.1308   0.6539   1.1302   1.2013   0.9891   0.8249   0.9463  -(
##
## sigma: 0.259336
## lambda (gene 1): 0.844104
## epsilon (gene 1): 0.282931
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 6080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 564.321
## delta (gene 1): 8.82553
## s (cell 1): 1.13951
## nu (cell 1): 1.10027
## theta (batch 1): 0.0129447
## betas:    1.6437  -0.1678  -0.4426  -0.0219  -0.0851   1.1634   0.7695   1.0318   0.6888   0.6833  -(
##
## sigma: 0.254176
## lambda (gene 1): 0.840728
## epsilon (gene 1): 0.375183
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
```

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## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 6120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 363.205
## delta (gene 1): 9.11525
## s (cell 1): 1.36672
## nu (cell 1): 0.988386
## theta (batch 1): 0.0541985
## betas:    0.8470  -0.2329  -0.0017   0.1572   0.0130   1.0968   1.5858   0.8680   1.3988   1.1224  -(
##
## sigma: 0.256979
## lambda (gene 1): 1.52825
## epsilon (gene 1): -0.281513
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 6160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 527.091
## delta (gene 1): 9.19651
## s (cell 1): 1.46917
## nu (cell 1): 0.993518
## theta (batch 1): 0.0429302
## betas:    1.7656  -0.2316  -0.0528  -0.8610  -0.3279   1.5533   0.3694   1.3457   0.5000   1.1256  -(
##
## sigma: 0.279031
## lambda (gene 1): 0.734636
## epsilon (gene 1): 0.610525
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 6200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 305.83
## delta (gene 1): 10.5438
## s (cell 1): 0.895884
## nu (cell 1): 1.08523
## theta (batch 1): 0.0116927
## betas:    1.1845  -0.2347   0.1683  -0.4393  -0.2986   1.2263   1.5049   0.4923   1.6120   0.6367   (
##
```

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## sigma: 0.291338
## lambda (gene 1): 1.94004
## epsilon (gene 1): 0.513502
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 6240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 375.141
## delta (gene 1): 10.4272
## s (cell 1): 1.21944
## nu (cell 1): 1.02775
## theta (batch 1): 0.0345394
## betas:    1.5595  -0.3902  -0.3442  -1.1387   0.1793   1.0849   1.3458   0.5763   1.6800   1.0033
##
## sigma: 0.271617
## lambda (gene 1): 1.48506
## epsilon (gene 1): 0.533285
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 6280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 556.482
## delta (gene 1): 10.8492
## s (cell 1): 0.706088
## nu (cell 1): 1.00341
## theta (batch 1): 0.0232756
## betas:    0.7146  -0.2670   0.3426   0.6015  -0.1615   0.7473   1.9835   0.7060   1.4517   1.6978  -0
##
## sigma: 0.274661
## lambda (gene 1): 0.53161
## epsilon (gene 1): 0.735171
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 6320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 643.969
```

```
## delta (gene 1): 9.08931
## s (cell 1): 1.27361
## nu (cell 1): 1.10511
## theta (batch 1): 0.0109286
## betas:    1.2065  -0.3965   0.4907  -0.6092  -0.2258   1.2854   1.0219   1.4364   1.1701   1.4561
##
## sigma: 0.257743
## lambda (gene 1): 0.206082
## epsilon (gene 1): 0.209577
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 6360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 623.972
## delta (gene 1): 9.1984
## s (cell 1): 1.23958
## nu (cell 1): 1.08164
## theta (batch 1): 0.0359638
## betas:    1.1764  -0.2612   0.2039   0.4643  -0.5599   0.9274   1.7030   0.4386   1.8142   0.5418
##
## sigma: 0.262388
## lambda (gene 1): 0.495227
## epsilon (gene 1): 0.47001
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 6400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 343.764
## delta (gene 1): 8.769
## s (cell 1): 1.15609
## nu (cell 1): 1.02144
## theta (batch 1): 0.017289
## betas:    1.3069  -0.2588   0.6947  -0.3334   0.1486   0.9274   1.1037   0.8605   1.3625   0.8826
##
## sigma: 0.269242
## lambda (gene 1): 0.983146
## epsilon (gene 1): 0.514175
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
```

```
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 6440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 529.582
## delta (gene 1): 10.8796
## s (cell 1): 0.844285
## nu (cell 1): 1.0071
## theta (batch 1): 0.0170009
## betas:    1.7961  -0.1002   1.2238   0.1997  -0.4317   0.9289   0.9947   0.6875   0.7172   0.5390  -(
##
## sigma: 0.238032
## lambda (gene 1): 1.23981
## epsilon (gene 1): 0.744592
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 6480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 537.314
## delta (gene 1): 10.3009
## s (cell 1): 1.2876
## nu (cell 1): 1.09039
## theta (batch 1): 0.0914569
## betas:    0.9871  -0.2330   0.1053   0.4913   0.1802   1.1592   1.2214   1.1745   1.1159   1.0435  -(
##
## sigma: 0.254604
## lambda (gene 1): 0.418444
## epsilon (gene 1): 0.0505152
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 6520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 676.638
## delta (gene 1): 12.1905
## s (cell 1): 0.96028
## nu (cell 1): 1.0564
## theta (batch 1): 0.0750901
## betas:    0.9611  -0.2202   1.0076   0.1968  -0.2324   1.4156   1.2038   1.0565   1.2662   0.8301  -(
##
## sigma: 0.256761
## lambda (gene 1): 0.795867
```

```
## epsilon (gene 1): 0.44848
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ------------------------------------------------------
## Iteration 6560 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 501.542
## delta (gene 1): 7.56557
## s (cell 1): 0.74806
## nu (cell 1): 1.12397
## theta (batch 1): 0.0483549
## betas:    1.6456  -0.2534   1.0051  -0.1202  -1.0097   1.7727   0.8483   0.7214   1.2197   0.7900  -0
##
## sigma: 0.267149
## lambda (gene 1): 1.17032
## epsilon (gene 1): 0.302523
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ------------------------------------------------------
## Iteration 6600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 500.261
## delta (gene 1): 9.70713
## s (cell 1): 1.66978
## nu (cell 1): 1.03662
## theta (batch 1): 0.0439848
## betas:    1.2946  -0.2729   0.2449  -0.3799   0.6714   1.0087   1.3168   0.6717   1.6090   0.4332   (
##
## sigma: 0.29204
## lambda (gene 1): 1.46582
## epsilon (gene 1): 0.234352
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 6640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 392.867
## delta (gene 1): 10.626
## s (cell 1): 0.915826
```

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## nu (cell 1): 1.0752
## theta (batch 1): 0.0100075
## betas:    2.0126  -0.1476   0.3157   0.0647  -0.3481   1.0496   1.0295   0.3949   0.8411   0.4388  -(
##
## sigma: 0.25772
## lambda (gene 1): 1.5664
## epsilon (gene 1): 0.32392
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 6680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 844.527
## delta (gene 1): 11.3522
## s (cell 1): 0.929691
## nu (cell 1): 1.01971
## theta (batch 1): 0.0208852
## betas:    1.3208  -0.2594  -0.0732   0.4649  -0.7534   1.0464   1.8342   0.2178   1.6251   0.9094  -(
##
## sigma: 0.274165
## lambda (gene 1): 0.700521
## epsilon (gene 1): 0.4972
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 6720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 381.222
## delta (gene 1): 11.3156
## s (cell 1): 1.51986
## nu (cell 1): 1.0511
## theta (batch 1): 0.0202471
## betas:    1.5013  -0.3158  -0.0653  -0.8622  -0.0786   1.2997   1.2804   0.4933   1.6198   0.9178  -(
##
## sigma: 0.280725
## lambda (gene 1): 0.57446
## epsilon (gene 1): 0.259952
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## -------------------------------------------------------
```

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## Iteration 6760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 314.884
## delta (gene 1): 14.8196
## s (cell 1): 0.977596
## nu (cell 1): 1.00061
## theta (batch 1): 0.00874323
## betas:    1.1575  -0.1936   0.1918  -0.7409   0.1613   2.0518   0.3538   1.4377   0.9122   0.9453  -(
##
## sigma: 0.26576
## lambda (gene 1): 1.7829
## epsilon (gene 1): 0.417485
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 6800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 516.718
## delta (gene 1): 11.1137
## s (cell 1): 1.1236
## nu (cell 1): 1.11335
## theta (batch 1): 0.00437819
## betas:    0.8677  -0.1040   0.6173  -0.6357   0.6980   0.8690   1.5568   0.7830   1.0372   1.0197  -(
##
## sigma: 0.275434
## lambda (gene 1): 0.734406
## epsilon (gene 1): 0.383965
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 6840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 455.606
## delta (gene 1): 9.7106
## s (cell 1): 1.07124
## nu (cell 1): 1.05591
## theta (batch 1): 0.00254635
## betas:    0.7479  -0.0927  -0.3114   0.3049   0.2775   1.4349   1.1113   1.0137   1.2370   0.5786  -(
##
## sigma: 0.257926
## lambda (gene 1): 1.73255
## epsilon (gene 1): 0.300648
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 6880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 440.982
## delta (gene 1): 9.33897
## s (cell 1): 1.15586
## nu (cell 1): 1.03296
## theta (batch 1): 0.0132624
## betas:    0.7363  -0.0882  -0.2385  -0.1007   0.7051   1.1285   1.2771   1.0628   0.9597   0.9159  -(
##
## sigma: 0.255222
## lambda (gene 1): 1.32268
## epsilon (gene 1): -0.153483
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 6920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 576.011
## delta (gene 1): 11.906
## s (cell 1): 1.44865
## nu (cell 1): 1.04223
## theta (batch 1): 0.0179699
## betas:    1.1084  -0.2199  -0.3360  -0.2825   0.0958   0.6784   1.7131   0.6302   1.4362   0.9173  -(
##
## sigma: 0.269641
## lambda (gene 1): 1.34276
## epsilon (gene 1): 0.841858
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 6960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 772.673
## delta (gene 1): 12.6665
## s (cell 1): 0.510587
## nu (cell 1): 0.993436
## theta (batch 1): 0.157591
```

```
## betas:    1.6879  -0.2209  -0.1624  -0.3987   0.0630   0.4260   1.6012   0.5366   0.8350   1.2896  -
##
## sigma: 0.249756
## lambda (gene 1): 0.946869
## epsilon (gene 1): 0.62222
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ------------------------------------------------------
## Iteration 7000 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 470.591
## delta (gene 1): 13.5869
## s (cell 1): 1.05469
## nu (cell 1): 1.08693
## theta (batch 1): 0.0505371
## betas:    0.8336  -0.2117  -0.0548  -0.6826   0.5814   0.6390   1.8000   0.6418   1.5458   0.9050
##
## sigma: 0.276176
## lambda (gene 1): 1.28684
## epsilon (gene 1): 0.571636
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 7040 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 499.303
## delta (gene 1): 9.12079
## s (cell 1): 1.67355
## nu (cell 1): 1.0441
## theta (batch 1): 0.0873825
## betas:    1.5612  -0.3724  -0.5127  -1.2699   0.2428   0.8175   1.1025   1.0648   1.2695   1.0044
##
## sigma: 0.262534
## lambda (gene 1): 1.64531
## epsilon (gene 1): 0.209347
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 7080 out of 40000 has been completed.
## ------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 491.626
## delta (gene 1): 12.2451
## s (cell 1): 1.54317
## nu (cell 1): 0.994843
## theta (batch 1): 0.0173094
## betas:    1.1869  -0.1036   0.8671  -0.3972   0.0613   1.3078   1.0461   0.8147   1.1468   0.5152  -(
##
## sigma: 0.256642
## lambda (gene 1): 0.6871
## epsilon (gene 1): 1.09582
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 7120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 876.929
## delta (gene 1): 12.3123
## s (cell 1): 0.931602
## nu (cell 1): 1.08086
## theta (batch 1): 0.0166963
## betas:    1.3953  -0.2914   0.4564  -0.2339  -0.2689   0.8890   1.5178   0.5541   1.5755   0.6734   (
##
## sigma: 0.266122
## lambda (gene 1): 0.841106
## epsilon (gene 1): 0.949948
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 7160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 576.142
## delta (gene 1): 9.3896
## s (cell 1): 0.992351
## nu (cell 1): 1.04104
## theta (batch 1): 0.00799323
## betas:    0.8345  -0.2821   0.9965  -0.2808   0.1648   1.1530   1.4943   0.9952   1.4483   1.2225  -(
##
## sigma: 0.257104
## lambda (gene 1): 1.92373
## epsilon (gene 1): 0.250626
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
```

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## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 7200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 625.742
## delta (gene 1): 11.9565
## s (cell 1): 1.01415
## nu (cell 1): 1.02449
## theta (batch 1): 0.00585867
## betas:    2.1366  -0.2921   0.3610  -0.7515  -0.0242   0.6552   0.9656   0.6817   0.9608   0.8194  -(
##
## sigma: 0.273805
## lambda (gene 1): 0.846994
## epsilon (gene 1): 0.69716
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 7240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.236
## delta (gene 1): 8.58566
## s (cell 1): 1.0282
## nu (cell 1): 1.0683
## theta (batch 1): 0.00488962
## betas:    1.9601  -0.2346  -0.3518  -0.1333  -0.9627   1.4530   0.7774   0.6124   1.0498   0.7322  -(
##
## sigma: 0.263541
## lambda (gene 1): 0.98513
## epsilon (gene 1): 0.419429
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 7280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 320.82
## delta (gene 1): 8.36767
## s (cell 1): 1.10596
## nu (cell 1): 1.20184
## theta (batch 1): 0.00542461
## betas:    0.9755  -0.1116  -0.3153   0.7464   0.2193   1.0523   1.4599   0.7535   1.1663   0.4914  -(
##
```

```
## sigma: 0.263428
## lambda (gene 1): 0.690703
## epsilon (gene 1): -0.12786
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 7320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 865.965
## delta (gene 1): 7.83391
## s (cell 1): 0.916961
## nu (cell 1): 0.984922
## theta (batch 1): 0.0110444
## betas:    1.5337  -0.2201  -0.2818  -1.0883   0.6549   0.8806   0.9910   0.9793   0.8743   0.9985  -(
##
## sigma: 0.255132
## lambda (gene 1): 0.530519
## epsilon (gene 1): 0.366726
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 7360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 749.118
## delta (gene 1): 10.2466
## s (cell 1): 1.27759
## nu (cell 1): 1.13318
## theta (batch 1): 0.0172936
## betas:    0.6029  -0.1649  -0.3036   0.5996  -0.5784   2.0850   0.6776   1.8324   0.4893   1.7440  -(
##
## sigma: 0.27308
## lambda (gene 1): 0.679222
## epsilon (gene 1): 6.50301e-05
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 7400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 388.259
```

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## delta (gene 1): 10.8974
## s (cell 1): 0.829224
## nu (cell 1): 1.09377
## theta (batch 1): 0.044913
## betas:    1.4732  -0.1575   0.0310  -0.1041  -0.4798   1.1572   0.9851   0.8874   0.9251   0.6976  -(
##
## sigma: 0.287947
## lambda (gene 1): 1.90962
## epsilon (gene 1): 0.240634
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 7440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 552.433
## delta (gene 1): 9.4423
## s (cell 1): 1.00427
## nu (cell 1): 1.00069
## theta (batch 1): 0.0585595
## betas:    1.1958  -0.2044   0.3622  -0.4480  -0.3259   1.0866   1.4677   0.5828   1.4773   0.6959  -(
##
## sigma: 0.258063
## lambda (gene 1): 0.585426
## epsilon (gene 1): 0.0801525
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 7480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 276.573
## delta (gene 1): 11.5537
## s (cell 1): 0.99744
## nu (cell 1): 1.07104
## theta (batch 1): 0.0301222
## betas:    1.3522  -0.1236  -0.3118  -0.1787  -0.1155   1.4208   1.0546   0.5824   1.3036   0.3241  -(
##
## sigma: 0.259157
## lambda (gene 1): 0.648
## epsilon (gene 1): 0.593627
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.3
## LSnu (cell 1): -5.1
```

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## LStheta (batch 1): -1.3
## --------------------------------------------------------
## Iteration 7520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 883.454
## delta (gene 1): 11.0081
## s (cell 1): 0.980953
## nu (cell 1): 1.03147
## theta (batch 1): 0.0119856
## betas:    0.6110  -0.1174   0.0767   0.2626  -0.0222   2.0272   0.9297   1.0916   1.3615   0.5607  -(
##
## sigma: 0.25375
## lambda (gene 1): 2.28526
## epsilon (gene 1): 0.442927
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 7560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 467.986
## delta (gene 1): 11.787
## s (cell 1): 1.01964
## nu (cell 1): 1.09948
## theta (batch 1): 0.00831044
## betas:    0.7938  -0.1969   0.1517  -0.4508   0.3118   1.5767   1.0557   1.1348   1.3373   0.7428   (
##
## sigma: 0.253561
## lambda (gene 1): 2.162
## epsilon (gene 1): 0.323637
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 7600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 379.572
## delta (gene 1): 8.95708
## s (cell 1): 0.873022
## nu (cell 1): 1.08164
## theta (batch 1): 0.0187958
## betas:    1.1230  -0.1740   0.3219  -0.5299   0.6055   0.8197   1.4599   0.7123   1.1632   0.9670  -(
##
## sigma: 0.288097
## lambda (gene 1): 1.72096
```

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## epsilon (gene 1): 0.590435
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 7640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 622.417
## delta (gene 1): 6.93019
## s (cell 1): 1.13526
## nu (cell 1): 1.05323
## theta (batch 1): 0.0238359
## betas:    1.1782  -0.2936   0.1588   0.0082  -0.7927   1.8345   0.8376   1.1104   1.4265   0.9049
##
## sigma: 0.252832
## lambda (gene 1): 0.42926
## epsilon (gene 1): 0.352209
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 7680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 417.629
## delta (gene 1): 9.20911
## s (cell 1): 0.647432
## nu (cell 1): 1.07865
## theta (batch 1): 0.081061
## betas:    0.5939  -0.2828   0.0330   0.0602   0.4182   1.1534   1.3275   1.2286   1.5284   1.2957  -0
##
## sigma: 0.268792
## lambda (gene 1): 0.639463
## epsilon (gene 1): 0.0354999
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 7720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 398.07
## delta (gene 1): 11.6286
## s (cell 1): 1.50434
```

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## nu (cell 1): 1.0613
## theta (batch 1): 0.0755819
## betas:    1.9158  -0.3516  -0.4488  -0.7532  -0.0338   1.0661   0.7553   0.9742   1.1185   0.9026   (
##
## sigma: 0.248479
## lambda (gene 1): 0.691533
## epsilon (gene 1): 0.430222
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 7760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 664.67
## delta (gene 1): 8.38536
## s (cell 1): 0.896097
## nu (cell 1): 1.01984
## theta (batch 1): 0.0359232
## betas:    0.5574  -0.1901   0.1391   0.1821   0.2136   1.6064   1.1986   1.0555   1.6390   0.7352   (
##
## sigma: 0.257341
## lambda (gene 1): 0.0913974
## epsilon (gene 1): 0.29765
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 7800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 401.019
## delta (gene 1): 9.05183
## s (cell 1): 1.61678
## nu (cell 1): 1.10593
## theta (batch 1): 0.0177488
## betas:    0.8244  -0.2419   0.4730  -0.4164   0.0220   1.2378   1.5856   0.6536   1.7245   0.8112   (
##
## sigma: 0.289172
## lambda (gene 1): 0.678939
## epsilon (gene 1): 0.0305071
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
```

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## Iteration 7840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 476.055
## delta (gene 1): 10.7448
## s (cell 1): 1.19836
## nu (cell 1): 1.09614
## theta (batch 1): 0.0180109
## betas:    1.9639  -0.2932  -0.3813  -1.1284  -0.5471   1.5737   0.6020   0.7632   1.1734   0.6558  -(
##
## sigma: 0.240912
## lambda (gene 1): 1.46749
## epsilon (gene 1): 0.248761
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 7880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 316.489
## delta (gene 1): 10.9198
## s (cell 1): 0.906829
## nu (cell 1): 1.08165
## theta (batch 1): 0.0107161
## betas:    1.3743  -0.2467  -0.0683  -0.7247   0.7269   0.8242   1.0718   1.1111   1.0123   0.8674   (
##
## sigma: 0.271297
## lambda (gene 1): 0.99482
## epsilon (gene 1): 0.304514
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 7920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 475.146
## delta (gene 1): 15.0699
## s (cell 1): 1.09997
## nu (cell 1): 1.07609
## theta (batch 1): 0.010333
## betas:    1.6052  -0.1862   0.6905  -1.1034   0.2918   0.4151   1.4248   0.6957   0.8865   0.9385  -(
##
## sigma: 0.261914
## lambda (gene 1): 0.798735
## epsilon (gene 1): 0.590395
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 7960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 490.933
## delta (gene 1): 9.75155
## s (cell 1): 1.22336
## nu (cell 1): 1.07853
## theta (batch 1): 0.00905605
## betas:    1.1719  -0.2175   0.2317   0.6403  -0.9387   1.5060   1.2851   0.6747   1.4202   0.8550  -(
##
## sigma: 0.267302
## lambda (gene 1): 0.390365
## epsilon (gene 1): 0.40001
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 8000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 533.818
## delta (gene 1): 12.2635
## s (cell 1): 1.11804
## nu (cell 1): 1.07081
## theta (batch 1): 0.011682
## betas:    0.6336  -0.0338   0.5650   0.7951   0.4314   1.0577   1.9083   0.4074   1.0944   1.1217  -
##
## sigma: 0.290979
## lambda (gene 1): 0.401181
## epsilon (gene 1): 0.596718
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 8040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 410.458
## delta (gene 1): 9.17482
## s (cell 1): 0.932931
## nu (cell 1): 1.02473
## theta (batch 1): 0.0600327
```

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## betas:    1.2942  -0.2528   0.9671  -0.0258  -0.5405   1.5236   1.1680   0.7220   1.4813   0.6178   (
##
## sigma: 0.259423
## lambda (gene 1): 1.64145
## epsilon (gene 1): 0.336457
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 8080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 585.561
## delta (gene 1): 9.96004
## s (cell 1): 0.879816
## nu (cell 1): 1.06084
## theta (batch 1): 0.0124687
## betas:    1.5088  -0.2406   0.1106  -0.2875   0.1344   0.8810   1.1335   0.6671   1.5000   0.4786   -(
##
## sigma: 0.261967
## lambda (gene 1): 1.63771
## epsilon (gene 1): 0.319348
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 8120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 523.579
## delta (gene 1): 9.13283
## s (cell 1): 0.908896
## nu (cell 1): 1.1033
## theta (batch 1): 0.0563812
## betas:    1.1100  -0.2121   0.0527  -0.2251   0.3418   1.2387   0.7828   1.5750   0.5609   1.4445   -(
##
## sigma: 0.249545
## lambda (gene 1): 0.269528
## epsilon (gene 1): 0.632638
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 8160 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.833
## delta (gene 1): 9.48901
## s (cell 1): 0.978698
## nu (cell 1): 1.09525
## theta (batch 1): 0.028883
## betas:    0.9544  -0.3412   0.3429  -0.9191   0.2693   1.6517   1.0131   1.0586   1.8405   0.7832  (
##
## sigma: 0.25366
## lambda (gene 1): 0.921685
## epsilon (gene 1): 0.202647
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.7
## --------------------------------------------------------
## Iteration 8200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 446.902
## delta (gene 1): 13.2758
## s (cell 1): 1.18143
## nu (cell 1): 1.07092
## theta (batch 1): 0.0191496
## betas:    0.9756  -0.2178   0.4157   0.2788  -0.2498   1.5464   1.0351   1.0414   1.2961   0.9095  -(
##
## sigma: 0.280273
## lambda (gene 1): 0.969846
## epsilon (gene 1): 0.48888
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 8240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 593.889
## delta (gene 1): 12.226
## s (cell 1): 1.38552
## nu (cell 1): 1.06563
## theta (batch 1): 0.0652153
## betas:    1.6000  -0.2939   0.1645  -1.2194   0.2091   1.2282   0.6274   1.3619   0.8176   1.1085  -(
##
## sigma: 0.262405
## lambda (gene 1): 1.76651
## epsilon (gene 1): 0.420499
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
```

```
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 8280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 537.602
## delta (gene 1): 9.44405
## s (cell 1): 0.876581
## nu (cell 1): 1.10561
## theta (batch 1): 0.0453021
## betas:    1.5027  -0.3089  -0.1636   0.0431  -0.2732   0.5550   1.8981   0.1839   1.8200   0.5879
##
## sigma: 0.255882
## lambda (gene 1): 2.42683
## epsilon (gene 1): 0.177989
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 8320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 618.003
## delta (gene 1): 12.3176
## s (cell 1): 1.08086
## nu (cell 1): 1.07479
## theta (batch 1): 0.022619
## betas:    1.1263  -0.2282  -0.1391  -0.2043  -0.0326   1.3207   1.1636   1.0126   1.1665   0.9729
##
## sigma: 0.25337
## lambda (gene 1): 1.17816
## epsilon (gene 1): 0.110276
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 8360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 483.223
## delta (gene 1): 10.2628
## s (cell 1): 0.848031
## nu (cell 1): 1.07095
## theta (batch 1): 0.0324427
## betas:    0.8635  -0.2195   0.3902  -0.2933   0.0072   2.1541   0.5001   1.5664   0.9546   1.2466
##
```

```
## sigma: 0.260782
## lambda (gene 1): 0.297275
## epsilon (gene 1): 0.286722
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 8400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 268.633
## delta (gene 1): 13.6842
## s (cell 1): 1.55179
## nu (cell 1): 0.99122
## theta (batch 1): 0.0597554
## betas:    0.4538  -0.1416  -0.1111   0.0860   0.7816   1.6721   1.1638   1.1564   1.2299   1.0793  -(
##
## sigma: 0.272868
## lambda (gene 1): 1.42941
## epsilon (gene 1): 0.115971
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 8440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 480.674
## delta (gene 1): 11.035
## s (cell 1): 0.67869
## nu (cell 1): 1.10161
## theta (batch 1): 0.0261454
## betas:    0.6265  -0.0976  -0.6534   0.4183   0.8048   1.2338   1.2745   1.2031   0.8798   1.1744  -(
##
## sigma: 0.248409
## lambda (gene 1): 0.988798
## epsilon (gene 1): -0.0641683
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 8480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.538
```

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## delta (gene 1): 9.24873
## s (cell 1): 1.36715
## nu (cell 1): 1.06561
## theta (batch 1): 0.0552128
## betas:    1.3459  -0.1824  -0.0446  -0.7970  -0.0045   1.0088   0.9885   1.0881   1.0019   0.5894   (
##
## sigma: 0.267659
## lambda (gene 1): 0.932098
## epsilon (gene 1): 0.325797
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 8520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 742.474
## delta (gene 1): 9.2119
## s (cell 1): 0.91523
## nu (cell 1): 1.04017
## theta (batch 1): 0.0759435
## betas:    0.7312  -0.0432   0.8406   0.0691  -0.0560   1.6664   1.1343   1.0447   0.8465   0.9303   -(
##
## sigma: 0.256433
## lambda (gene 1): 0.888169
## epsilon (gene 1): 0.195199
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 8560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 656.925
## delta (gene 1): 11.579
## s (cell 1): 1.39992
## nu (cell 1): 1.18861
## theta (batch 1): 0.00833555
## betas:    1.5561  -0.2192  -0.2151  -0.5204  -0.3865   1.3550   0.8926   0.8846   1.0230   0.9027   -(
##
## sigma: 0.256371
## lambda (gene 1): 1.69743
## epsilon (gene 1): 0.547555
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
```

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## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 8600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 364.541
## delta (gene 1): 8.63472
## s (cell 1): 1.26925
## nu (cell 1): 1.10162
## theta (batch 1): 0.00748062
## betas:    1.2303  -0.2498   0.1349  -0.6164   0.2121   1.1745   0.9989   0.9943   1.2982   0.8295
##
## sigma: 0.2735
## lambda (gene 1): 1.08268
## epsilon (gene 1): -0.170894
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 8640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 340.058
## delta (gene 1): 11.6127
## s (cell 1): 1.12584
## nu (cell 1): 1.04029
## theta (batch 1): 0.0196452
## betas:    1.0273  -0.3064  -0.1400  -0.0182  -0.0023   0.8397   1.7770   0.7509   1.4195   1.2939
##
## sigma: 0.25765
## lambda (gene 1): 0.997214
## epsilon (gene 1): 0.130659
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 8680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 610.345
## delta (gene 1): 8.44652
## s (cell 1): 0.992128
## nu (cell 1): 0.993468
## theta (batch 1): 0.0268903
## betas:    1.5715  -0.0957   0.2190  -0.0825  -0.0504   0.9859   1.1425   0.7318   0.6786   0.6970
##
## sigma: 0.270993
## lambda (gene 1): 1.28071
```

```
## epsilon (gene 1): 0.161911
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 8720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 400.447
## delta (gene 1): 8.33195
## s (cell 1): 1.00289
## nu (cell 1): 1.04882
## theta (batch 1): 0.0314907
## betas:    1.0172  -0.2340   0.3301  -0.5419   0.2609   0.6525   1.6631   0.5882   1.6790   0.8470   (
##
## sigma: 0.264556
## lambda (gene 1): 1.1318
## epsilon (gene 1): 0.286316
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 8760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 340.963
## delta (gene 1): 18.6994
## s (cell 1): 1.35251
## nu (cell 1): 1.03102
## theta (batch 1): 0.0368836
## betas:    1.3632  -0.1639   0.4877  -0.3763  -0.0659   1.2301   1.3693   0.3105   1.5088   0.4394  -(
##
## sigma: 0.258579
## lambda (gene 1): 0.525789
## epsilon (gene 1): 1.03477
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 8800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 336.3
## delta (gene 1): 11.2848
## s (cell 1): 1.07201
```

```
## nu (cell 1): 1.02086
## theta (batch 1): 0.0283783
## betas:    1.0934  -0.1891   0.5588  -0.4281  -0.0430   1.3099   1.4952   0.4819   1.4502   0.8953  -(
##
## sigma: 0.27703
## lambda (gene 1): 0.677521
## epsilon (gene 1): 0.124721
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 8840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 952.1
## delta (gene 1): 13.2092
## s (cell 1): 1.2605
## nu (cell 1): 1.05123
## theta (batch 1): 0.0259826
## betas:    0.7034  -0.1229   0.8130  -0.5884   1.1794   0.7182   1.6488   0.7585   1.4120   0.6914   (
##
## sigma: 0.247534
## lambda (gene 1): 1.14718
## epsilon (gene 1): 0.287376
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 8880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 453.019
## delta (gene 1): 6.76335
## s (cell 1): 0.94908
## nu (cell 1): 1.05858
## theta (batch 1): 0.113601
## betas:    1.7745  -0.3290  -0.0747  -0.7165   0.4920   0.7800   1.1712   0.6286   1.4364   0.6770  -(
##
## sigma: 0.25646
## lambda (gene 1): 1.32822
## epsilon (gene 1): 0.336515
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## -------------------------------------------------------
```

```
## Iteration 8920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 373.675
## delta (gene 1): 11.845
## s (cell 1): 1.18551
## nu (cell 1): 1.09552
## theta (batch 1): 0.046239
## betas:    1.3692  -0.3360  -0.2550  -0.2259   0.0456   1.2257   1.1843   0.8237   1.5570   0.9176  (
##
## sigma: 0.253381
## lambda (gene 1): 1.31295
## epsilon (gene 1): 0.753684
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 8960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 884.099
## delta (gene 1): 9.30633
## s (cell 1): 1.02781
## nu (cell 1): 1.06012
## theta (batch 1): 0.01018
## betas:    1.1613  -0.2503   0.3065   0.3670  -0.4490   1.2679   1.2815   1.2071   0.7558   1.5409  -(
##
## sigma: 0.256244
## lambda (gene 1): 0.530482
## epsilon (gene 1): 0.0484032
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 9000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 628.057
## delta (gene 1): 13.1159
## s (cell 1): 1.19469
## nu (cell 1): 1.05205
## theta (batch 1): 0.00953749
## betas:    1.5410  -0.2578  -0.3229  -0.1013  -0.3430   1.3007   1.2625   0.4792   1.4433   0.6823  -(
##
## sigma: 0.280261
## lambda (gene 1): 0.595398
## epsilon (gene 1): 0.829085
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 9040 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 755.433
## delta (gene 1): 9.10505
## s (cell 1): 1.01266
## nu (cell 1): 1.0777
## theta (batch 1): 0.0121851
## betas:    1.8483  -0.2091  -0.3943  -0.5133  -0.0484   1.4360   0.6264   0.7236   1.2273   0.0266   (
##
## sigma: 0.260652
## lambda (gene 1): 0.885366
## epsilon (gene 1): 0.442328
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 9080 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 712.017
## delta (gene 1): 12.7023
## s (cell 1): 1.02357
## nu (cell 1): 1.04232
## theta (batch 1): 0.0080153
## betas:    0.9320  -0.1710  -0.0071  -0.4782   0.6291   0.5725   1.8631   0.6231   1.2650   0.9790  -(
##
## sigma: 0.252353
## lambda (gene 1): 0.809892
## epsilon (gene 1): 1.45169
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## ------------------------------------------------------
## Iteration 9120 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 473.074
## delta (gene 1): 10.5592
## s (cell 1): 1.07991
## nu (cell 1): 1.07595
## theta (batch 1): 0.00358283
```

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## betas:     1.0884  -0.1464   0.2226  -0.3360   0.1204   1.1050   1.5417   0.5533   1.3895   0.4999  -(
##
## sigma: 0.247821
## lambda (gene 1): 0.127515
## epsilon (gene 1): 0.665636
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 9160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 571.173
## delta (gene 1): 7.83925
## s (cell 1): 1.1784
## nu (cell 1): 1.09438
## theta (batch 1): 0.0069857
## betas:     1.5949  -0.2558  -0.9206   0.1946   0.0755   0.7765   1.2722   0.7357   1.0252   1.1139  -(
##
## sigma: 0.255712
## lambda (gene 1): 0.71521
## epsilon (gene 1): 0.598889
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## ------------------------------------------------------
## Iteration 9200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 676.667
## delta (gene 1): 13.0872
## s (cell 1): 0.852399
## nu (cell 1): 1.02559
## theta (batch 1): 0.0460739
## betas:     1.2561  -0.2945  -0.0574  -0.1092   0.3514   0.8921   1.4806   0.6876   1.5271   0.7562   (
##
## sigma: 0.281256
## lambda (gene 1): 0.43186
## epsilon (gene 1): 0.876517
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 9240 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 831.046
## delta (gene 1): 8.08262
## s (cell 1): 1.10265
## nu (cell 1): 1.10664
## theta (batch 1): 0.0406443
## betas:    1.3964  -0.3102   0.5278  -0.6802  -0.4576   1.8676   0.9277   0.8620   1.4345   0.7758   (
##
## sigma: 0.266214
## lambda (gene 1): 0.213607
## epsilon (gene 1): 0.390904
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 9280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 434.429
## delta (gene 1): 8.07022
## s (cell 1): 0.936285
## nu (cell 1): 1.04442
## theta (batch 1): 0.0256358
## betas:    0.9836  -0.2522   0.1919  -0.2619  -0.0393   1.5689   0.9384   1.2491   1.2840   0.8453   (
##
## sigma: 0.257946
## lambda (gene 1): 1.67685
## epsilon (gene 1): 0.687788
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## --------------------------------------------------------
## Iteration 9320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 483.949
## delta (gene 1): 8.5946
## s (cell 1): 1.05485
## nu (cell 1): 1.10304
## theta (batch 1): 0.00695153
## betas:    1.5136  -0.3108   1.0312  -1.2882  -0.0865   1.3041   1.2345   0.4701   1.7475   0.5842   (
##
## sigma: 0.253134
## lambda (gene 1): 2.12558
## epsilon (gene 1): 0.0106525
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
```

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## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 9360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 821.476
## delta (gene 1): 11.9404
## s (cell 1): 1.24239
## nu (cell 1): 1.07646
## theta (batch 1): 0.0307958
## betas:    1.3515  -0.2490  -0.1479   0.0275   0.4785   0.5141   1.7084   0.6258   1.1786   1.0000  -(
##
## sigma: 0.272922
## lambda (gene 1): 2.2402
## epsilon (gene 1): 0.432241
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 9400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 460.703
## delta (gene 1): 10.7618
## s (cell 1): 1.32168
## nu (cell 1): 1.12172
## theta (batch 1): 0.0701709
## betas:    1.5027  -0.2694   0.4826  -0.5137  -0.0653   0.9010   1.2863   0.8473   1.0344   1.0499   (
##
## sigma: 0.281529
## lambda (gene 1): 0.738121
## epsilon (gene 1): 0.315601
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 9440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 640.852
## delta (gene 1): 9.43254
## s (cell 1): 0.944626
## nu (cell 1): 1.03978
## theta (batch 1): 0.0849933
## betas:    1.6062  -0.2667   0.3815  -0.3384  -0.2568   0.9772   1.1455   0.8587   1.0300   1.0114  -(
##
```

```
## sigma: 0.275607
## lambda (gene 1): 1.4825
## epsilon (gene 1): 0.215432
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 9480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 484.836
## delta (gene 1): 8.83839
## s (cell 1): 1.62889
## nu (cell 1): 1.12237
## theta (batch 1): 0.058042
## betas:    1.8289  -0.2579   0.6002  -0.5535  -0.0683   0.5497   0.9557   0.9025   0.8940   0.9619  -(
##
## sigma: 0.259257
## lambda (gene 1): 1.10543
## epsilon (gene 1): -0.159359
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## ----------------------------------------------------------
## Iteration 9520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 363.078
## delta (gene 1): 8.53814
## s (cell 1): 1.01233
## nu (cell 1): 1.07306
## theta (batch 1): 0.0550623
## betas:    1.6564  -0.2948   1.1852  -0.6378  -0.7999   1.2098   1.3729   0.4208   1.5160   0.7399  -(
##
## sigma: 0.258484
## lambda (gene 1): 1.3603
## epsilon (gene 1): 0.0477853
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.2
## ----------------------------------------------------------
## Iteration 9560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 483.325
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## delta (gene 1): 10.599
## s (cell 1): 1.20824
## nu (cell 1): 1.07514
## theta (batch 1): 0.0263587
## betas:     1.2045  -0.2756  -1.2303   0.0600  -0.4752   2.0552   0.6899   0.9689   1.5693   0.6188   (
##
## sigma: 0.264411
## lambda (gene 1): 1.04504
## epsilon (gene 1): 0.121009
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.1
## --------------------------------------------------------
## Iteration 9600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 516.572
## delta (gene 1): 10.341
## s (cell 1): 0.909752
## nu (cell 1): 1.10131
## theta (batch 1): 0.0160013
## betas:     0.9572  -0.1826  -0.1048  -0.6074   0.7358   1.0957   1.3030   0.9189   1.1924   0.8712  -(
##
## sigma: 0.270182
## lambda (gene 1): 1.48758
## epsilon (gene 1): 0.232113
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.2
## --------------------------------------------------------
## Iteration 9640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 402.098
## delta (gene 1): 11.5864
## s (cell 1): 0.889079
## nu (cell 1): 1.0342
## theta (batch 1): 0.0525057
## betas:     0.6817  -0.1337   0.4150  -0.1529   0.7821   1.0536   1.7028   0.6505   1.3981   0.8970  -(
##
## sigma: 0.255445
## lambda (gene 1): 0.766277
## epsilon (gene 1): 0.354597
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
```

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## LStheta (batch 1): -1.2
## --------------------------------------------------------
## Iteration 9680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 324.966
## delta (gene 1): 10.9247
## s (cell 1): 1.07249
## nu (cell 1): 1.02724
## theta (batch 1): 0.0387183
## betas:    1.0351  -0.0824   0.0457  -0.0794   0.7430   0.4797   2.0534   0.2018   1.2528   0.8102  -(
##
## sigma: 0.267415
## lambda (gene 1): 0.916098
## epsilon (gene 1): 0.511531
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## --------------------------------------------------------
## Iteration 9720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.815
## delta (gene 1): 11.6685
## s (cell 1): 1.03453
## nu (cell 1): 1.02161
## theta (batch 1): 0.00793494
## betas:    1.0728  -0.2282   0.1872   0.0278   0.2996   1.1996   1.2858   0.7586   1.5652   0.6004  -(
##
## sigma: 0.25783
## lambda (gene 1): 0.368973
## epsilon (gene 1): 0.467015
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 9760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.74
## delta (gene 1): 10.8712
## s (cell 1): 0.927818
## nu (cell 1): 1.00395
## theta (batch 1): 0.0158288
## betas:    1.2011  -0.2291   0.2459  -0.3042   0.0139   0.6912   1.5680   0.7664   1.0070   1.5117  -(
##
## sigma: 0.257579
## lambda (gene 1): 1.37452
```

```
## epsilon (gene 1): 0.316529
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 9800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 699.376
## delta (gene 1): 9.81691
## s (cell 1): 1.11084
## nu (cell 1): 1.03418
## theta (batch 1): 0.0304731
## betas:    1.2435  -0.1368   0.6154  -0.6998   0.0498   1.3657   0.6922   1.2777   0.5178   1.3063  -0
##
## sigma: 0.297549
## lambda (gene 1): 0.370678
## epsilon (gene 1): 0.599386
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 9840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 609.734
## delta (gene 1): 9.01565
## s (cell 1): 1.18942
## nu (cell 1): 1.12978
## theta (batch 1): 0.0461332
## betas:    1.8313  -0.2488  -0.3507  -0.9404   0.1922   0.6100   1.2840   0.5658   1.0861   0.8554  -0
##
## sigma: 0.258011
## lambda (gene 1): 0.485283
## epsilon (gene 1): 0.572538
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 9880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 534.73
## delta (gene 1): 8.77049
## s (cell 1): 1.24703
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## nu (cell 1): 1.05381
## theta (batch 1): 0.0133813
## betas:    1.8180  -0.2445   0.4286  -0.7286  -0.3291   1.2662   1.1326   0.3610   1.3851   0.4363  -(
##
## sigma: 0.257889
## lambda (gene 1): 0.593454
## epsilon (gene 1): 0.238819
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ------------------------------------------------------------
## Iteration 9920 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 404.634
## delta (gene 1): 10.408
## s (cell 1): 1.13938
## nu (cell 1): 1.10238
## theta (batch 1): 0.0169912
## betas:    1.4264  -0.3142  -0.3894  -0.5587  -0.3882   1.1155   0.8706   1.0788   1.3861   0.8513   (
##
## sigma: 0.264976
## lambda (gene 1): 1.44403
## epsilon (gene 1): 0.373683
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ------------------------------------------------------------
## Iteration 9960 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 731.282
## delta (gene 1): 9.57931
## s (cell 1): 1.00421
## nu (cell 1): 1.02944
## theta (batch 1): 0.0151018
## betas:    1.7703  -0.3372  -0.7784  -0.7930  -0.0100   0.8325   1.2266   0.6021   1.5154   0.6444   (
##
## sigma: 0.238674
## lambda (gene 1): 1.82887
## epsilon (gene 1): 0.76336
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ------------------------------------------------------------
```

```
## Iteration 10000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 324.967
## delta (gene 1): 13.0402
## s (cell 1): 1.48421
## nu (cell 1): 1.09427
## theta (batch 1): 0.0489975
## betas:    1.3978  -0.1342   0.0029  -0.0023   0.1057   0.5500   1.6942   0.4636   0.8346   1.0873  -0
##
## sigma: 0.26557
## lambda (gene 1): 0.865883
## epsilon (gene 1): 0.264112
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 10040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 415.101
## delta (gene 1): 10.6228
## s (cell 1): 1.30655
## nu (cell 1): 1.11119
## theta (batch 1): 0.0128945
## betas:    1.5283  -0.2776  -0.3583  -0.4151  -0.3758   1.1979   1.1899   0.7637   1.2113   0.8985   (
##
## sigma: 0.255596
## lambda (gene 1): 1.61492
## epsilon (gene 1): 0.0880143
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 10080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 373.354
## delta (gene 1): 8.09399
## s (cell 1): 1.15619
## nu (cell 1): 1.12502
## theta (batch 1): 0.00898632
## betas:    1.4831  -0.1787   0.2539  -0.5577   0.3370   1.1972   0.8267   0.9275   1.0971   0.3090   (
##
## sigma: 0.252322
## lambda (gene 1): 0.414509
## epsilon (gene 1): -0.367028
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 10120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 750.719
## delta (gene 1): 9.38239
## s (cell 1): 1.29163
## nu (cell 1): 1.05129
## theta (batch 1): 0.0120527
## betas:    1.4178  -0.2312   0.2204  -0.4214  -0.1732   1.4416   0.8835   0.9491   1.0388   1.0013  -0
##
## sigma: 0.267454
## lambda (gene 1): 0.39783
## epsilon (gene 1): -0.205048
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 10160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 368.603
## delta (gene 1): 7.37156
## s (cell 1): 1.02071
## nu (cell 1): 1.07503
## theta (batch 1): 0.00625776
## betas:    0.6873  -0.1692   0.2035  -0.1624   0.4921   1.2420   1.3743   1.0734   1.1273   1.2651  -0
##
## sigma: 0.264062
## lambda (gene 1): 2.18875
## epsilon (gene 1): 0.0693644
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 10200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 409.994
## delta (gene 1): 10.031
## s (cell 1): 0.862362
## nu (cell 1): 1.08608
## theta (batch 1): 0.0403816
```

```
## betas:      1.0594  -0.1047   0.1744  -0.0213   0.0757   1.5557   0.9742   0.8234   1.1635   0.4935
##
## sigma: 0.288042
## lambda (gene 1): 0.72545
## epsilon (gene 1): 0.690109
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 10240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 131.887
## delta (gene 1): 17.1112
## s (cell 1): 1.38066
## nu (cell 1): 1.0975
## theta (batch 1): 0.0410525
## betas:      0.9521  -0.3137  -0.2633  -0.9741   0.6102   1.0667   1.5029   0.7119   2.0274   0.4098
##
## sigma: 0.274494
## lambda (gene 1): 0.277572
## epsilon (gene 1): 1.21957
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 10280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.077
## delta (gene 1): 13.9106
## s (cell 1): 1.10713
## nu (cell 1): 1.02604
## theta (batch 1): 0.0383851
## betas:      1.2263  -0.1982   0.3858  -0.6858   0.1825   0.9858   1.3544   0.7227   1.3105   0.6818  -(
##
## sigma: 0.276789
## lambda (gene 1): 1.23429
## epsilon (gene 1): 0.750243
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 10320 out of 40000 has been completed.
## --------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 425.014
## delta (gene 1): 11.3926
## s (cell 1): 1.10677
## nu (cell 1): 1.10138
## theta (batch 1): 0.0486575
## betas:    1.3365  -0.1713   0.1584  -0.4398   0.1905   0.4753   1.6798   0.3969   1.4148   0.6625  -(
##
## sigma: 0.253847
## lambda (gene 1): 3.14603
## epsilon (gene 1): 0.350738
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 10360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 568.257
## delta (gene 1): 9.82201
## s (cell 1): 1.15595
## nu (cell 1): 0.99064
## theta (batch 1): 0.0180522
## betas:    1.1789  -0.3521  -0.5799  -0.2560  -0.2067   1.2748   1.4492   0.8069   1.6571   0.8410
##
## sigma: 0.268704
## lambda (gene 1): 0.555938
## epsilon (gene 1): 0.24783
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 10400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 412.212
## delta (gene 1): 9.6238
## s (cell 1): 1.29762
## nu (cell 1): 1.0983
## theta (batch 1): 0.0746374
## betas:    1.5222  -0.2394   0.0463  -0.8967   0.3348   0.5484   1.5430   0.5308   1.2845   0.7608  -(
##
## sigma: 0.288031
## lambda (gene 1): 0.836025
## epsilon (gene 1): 0.4605
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
```

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## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 10440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 411.779
## delta (gene 1): 11.4657
## s (cell 1): 1.18209
## nu (cell 1): 1.05071
## theta (batch 1): 0.021124
## betas:    1.4381  -0.2536  -0.5517  -0.7483   0.2827   0.7367   0.9100   1.2452   0.9627   0.9639  -(
##
## sigma: 0.247752
## lambda (gene 1): 0.48527
## epsilon (gene 1): 0.653741
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 10480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 490.714
## delta (gene 1): 11.0396
## s (cell 1): 1.09962
## nu (cell 1): 1.06591
## theta (batch 1): 0.0119112
## betas:    0.7899  -0.2386   0.3059  -0.9545   0.3537   0.8977   1.5669   0.9751   1.3777   1.1702   (
##
## sigma: 0.260079
## lambda (gene 1): 0.624594
## epsilon (gene 1): 0.957371
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 10520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 713.775
## delta (gene 1): 9.67652
## s (cell 1): 1.0637
## nu (cell 1): 1.0991
## theta (batch 1): 0.00454532
## betas:    0.9343  -0.2237  -0.0569  -0.8801   0.2313   1.2968   1.1353   1.1230   1.3442   0.6915   (
##
```

```
## sigma: 0.260101
## lambda (gene 1): 0.823984
## epsilon (gene 1): 0.153904
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 10560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 378.561
## delta (gene 1): 9.51626
## s (cell 1): 1.1428
## nu (cell 1): 1.03876
## theta (batch 1): 0.00503462
## betas:    1.4685  -0.2706  -0.3753  -0.7692  -0.2057   1.6945   0.9129   0.8126   1.2827   0.8954  -(
##
## sigma: 0.256834
## lambda (gene 1): 0.938534
## epsilon (gene 1): 0.373119
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## ----------------------------------------------------------
## Iteration 10600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 441.681
## delta (gene 1): 8.30771
## s (cell 1): 0.998823
## nu (cell 1): 1.13127
## theta (batch 1): 0.0117175
## betas:    1.1321  -0.1220  -0.2700   0.1861   0.1349   1.3012   1.2717   0.6559   1.1093   0.7992  -(
##
## sigma: 0.289964
## lambda (gene 1): 2.05757
## epsilon (gene 1): 0.069789
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.2
## ----------------------------------------------------------
## Iteration 10640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 931.032
```

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## delta (gene 1): 7.93612
## s (cell 1): 1.03318
## nu (cell 1): 1.06488
## theta (batch 1): 0.0045998
## betas:    1.7066  -0.2905  -0.7606  -0.9778   0.1844   1.2248   0.9343   0.7712   1.2067   0.9710  -0
##
## sigma: 0.248341
## lambda (gene 1): 1.25391
## epsilon (gene 1): 0.0643371
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.2
## -------------------------------------------------------
## Iteration 10680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 390.354
## delta (gene 1): 13.4396
## s (cell 1): 1.20832
## nu (cell 1): 1.04325
## theta (batch 1): 0.0171936
## betas:    0.6939  -0.1399  -0.1504   0.5781   0.0472   1.7017   1.2985   0.7934   1.3980   0.7761  -0
##
## sigma: 0.262501
## lambda (gene 1): 1.1927
## epsilon (gene 1): 0.487977
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 10720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 614.305
## delta (gene 1): 7.91021
## s (cell 1): 0.878657
## nu (cell 1): 1.0778
## theta (batch 1): 0.0158845
## betas:    1.3836  -0.3048   0.0071  -1.0234  -0.2040   1.6443   0.8905   1.0502   1.2171   0.9972   0
##
## sigma: 0.266565
## lambda (gene 1): 0.675593
## epsilon (gene 1): -0.0298922
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
```

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## LStheta (batch 1): -1.2
## ---------------------------------------------------------
## Iteration 10760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 384.584
## delta (gene 1): 14.1088
## s (cell 1): 1.06898
## nu (cell 1): 1.04506
## theta (batch 1): 0.0172057
## betas:    0.9293  -0.2007  -0.0397  -0.0431  -0.3330   1.7445   1.0689   0.9156   1.5104   0.7000  -(
##
## sigma: 0.268861
## lambda (gene 1): 1.19187
## epsilon (gene 1): 0.761766
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 10800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 442.824
## delta (gene 1): 7.79498
## s (cell 1): 1.41414
## nu (cell 1): 1.10289
## theta (batch 1): 0.0394602
## betas:    1.2899  -0.1521  -0.3683   0.1293  -0.1293   1.3574   1.0285   0.8423   0.9530   0.8581  -(
##
## sigma: 0.27337
## lambda (gene 1): 1.88905
## epsilon (gene 1): -0.0236453
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 10840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 495.17
## delta (gene 1): 9.13558
## s (cell 1): 0.838388
## nu (cell 1): 1.04049
## theta (batch 1): 0.0325456
## betas:    0.4838  -0.1994   0.1844   0.2603   0.3776   1.0925   1.9205   0.7322   1.5945   1.1415  -(
##
## sigma: 0.247946
## lambda (gene 1): 0.443046
```

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## epsilon (gene 1): 0.165263
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 10880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.043
## delta (gene 1): 10.3799
## s (cell 1): 0.877014
## nu (cell 1): 1.06107
## theta (batch 1): 0.0694508
## betas:    1.5647  -0.2954   0.2747  -0.3932  -0.5192   1.6228   0.8632   1.1350   0.6947   1.6372  -(
##
## sigma: 0.258208
## lambda (gene 1): 3.37773
## epsilon (gene 1): 0.331547
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 10920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 474.564
## delta (gene 1): 11.7046
## s (cell 1): 1.3311
## nu (cell 1): 1.04118
## theta (batch 1): 0.122198
## betas:    1.4374  -0.2767   0.1151   0.4354  -1.1104   1.7187   0.8900   1.0252   1.0443   1.2113  -(
##
## sigma: 0.257609
## lambda (gene 1): 1.70946
## epsilon (gene 1): 0.267683
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 10960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1035.94
## delta (gene 1): 9.3352
## s (cell 1): 0.865378
```

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## nu (cell 1): 1.02867
## theta (batch 1): 0.0404791
## betas:    1.5839  -0.2577   0.2837   0.0904  -0.3308   1.1721   1.0048   1.1007   0.8021   0.9040
##
## sigma: 0.260877
## lambda (gene 1): 0.968593
## epsilon (gene 1): 0.331581
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## ----------------------------------------------------------
## Iteration 11000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 783.291
## delta (gene 1): 8.44167
## s (cell 1): 1.2127
## nu (cell 1): 0.974357
## theta (batch 1): 0.0249927
## betas:    0.6636  -0.3192   0.7993  -0.7686   0.0042   1.6076   1.4398   0.7852   2.0221   0.9523
##
## sigma: 0.288825
## lambda (gene 1): 0.673734
## epsilon (gene 1): 0.567904
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 11040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 713.998
## delta (gene 1): 6.38651
## s (cell 1): 1.20048
## nu (cell 1): 1.07765
## theta (batch 1): 0.0222355
## betas:    1.0471  -0.1115   0.3270   0.2539   0.1039   0.8198   1.9039   0.2036   1.6160   0.3452
##
## sigma: 0.254282
## lambda (gene 1): 0.998745
## epsilon (gene 1): 0.28515
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
```

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## Iteration 11080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 320.191
## delta (gene 1): 9.11559
## s (cell 1): 1.0242
## nu (cell 1): 1.09008
## theta (batch 1): 0.0739695
## betas:    1.0908  -0.2866  -0.1878   0.2395  -0.4013   1.1646   1.2614   1.1198   1.1997   1.2718
##
## sigma: 0.254912
## lambda (gene 1): 0.213723
## epsilon (gene 1): 0.324085
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 11120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 597.79
## delta (gene 1): 12.0431
## s (cell 1): 0.708786
## nu (cell 1): 1.08012
## theta (batch 1): 0.084216
## betas:    1.2712  -0.2446  -0.0149  -0.3416   0.2466   1.1827   1.3057   0.8002   1.2667   0.8179
##
## sigma: 0.251461
## lambda (gene 1): 1.23774
## epsilon (gene 1): 0.135615
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 11160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 356.845
## delta (gene 1): 12.4082
## s (cell 1): 1.10449
## nu (cell 1): 1.07166
## theta (batch 1): 0.0367704
## betas:    1.0266  -0.3628  -0.4720  -0.0935   0.0676   1.0711   1.2496   1.3265   1.3512   1.1668
##
## sigma: 0.254698
## lambda (gene 1): 1.80903
## epsilon (gene 1): 0.531869
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 11200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.505
## delta (gene 1): 8.10378
## s (cell 1): 1.3494
## nu (cell 1): 1.0676
## theta (batch 1): 0.0923312
## betas:    1.2474  -0.0987  -0.2466   0.4442  -0.0314   1.3992   1.0996   0.5429   1.3819   0.0370   (
##
## sigma: 0.276293
## lambda (gene 1): 0.284507
## epsilon (gene 1): -0.369841
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 11240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 498.711
## delta (gene 1): 10.6072
## s (cell 1): 0.830131
## nu (cell 1): 1.03926
## theta (batch 1): 0.0315115
## betas:    0.8925  -0.2075  -0.7578  -0.4644   0.6121   1.3379   1.3084   0.8993   1.4021   0.8202   (
##
## sigma: 0.247373
## lambda (gene 1): 0.930262
## epsilon (gene 1): -0.0998842
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 11280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 503.354
## delta (gene 1): 11.3822
## s (cell 1): 0.663132
## nu (cell 1): 1.05259
## theta (batch 1): 0.0793605
```

```
## betas:    0.3985  -0.2224   0.0349  -0.3115  -0.0724   0.9230   1.9997   0.8535   1.5446   1.5170  -(
##
## sigma: 0.264774
## lambda (gene 1): 0.514192
## epsilon (gene 1): 0.487667
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 11320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 471.24
## delta (gene 1): 10.5271
## s (cell 1): 1.16722
## nu (cell 1): 1.10907
## theta (batch 1): 0.0241085
## betas:    0.5475  -0.2023  -0.2213  -0.5151   0.2500   1.5107   1.3927   1.0062   1.5703   0.7921   (
##
## sigma: 0.252987
## lambda (gene 1): 0.957031
## epsilon (gene 1): 0.329612
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 11360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 768.148
## delta (gene 1): 9.78437
## s (cell 1): 0.966781
## nu (cell 1): 1.0463
## theta (batch 1): 0.00668581
## betas:    1.0829  -0.2566  -0.9003   0.1859  -0.3453   1.9851   1.0366   0.5524   2.1191   0.0704   (
##
## sigma: 0.271333
## lambda (gene 1): 0.457447
## epsilon (gene 1): 0.329309
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 11400 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 555.723
## delta (gene 1): 12.3358
## s (cell 1): 1.00089
## nu (cell 1): 1.05014
## theta (batch 1): 0.0137931
## betas:    1.2429  -0.0775  -0.4187   0.4302  -0.3796   1.3617   1.1291   0.7208   0.8858   0.7763  -(
##
## sigma: 0.288534
## lambda (gene 1): 0.948373
## epsilon (gene 1): 0.655147
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ------------------------------------------------------
## Iteration 11440 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 595.1
## delta (gene 1): 11.3529
## s (cell 1): 1.11814
## nu (cell 1): 0.999609
## theta (batch 1): 0.017975
## betas:    0.6836  -0.1427  -0.9894   0.0565   0.8977   0.9904   1.3231   1.2628   0.8175   1.3571  -(
##
## sigma: 0.266736
## lambda (gene 1): 1.34674
## epsilon (gene 1): 0.561906
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ------------------------------------------------------
## Iteration 11480 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 400.293
## delta (gene 1): 6.6344
## s (cell 1): 0.99805
## nu (cell 1): 1.0862
## theta (batch 1): 0.026437
## betas:    1.6191  -0.3046  -0.7919  -0.8356   0.6004   0.5488   1.2250   0.7904   1.4180   0.3388   (
##
## sigma: 0.272659
## lambda (gene 1): 2.27294
## epsilon (gene 1): 0.317797
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
```

```
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 11520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 305.553
## delta (gene 1): 8.93485
## s (cell 1): 1.31653
## nu (cell 1): 1.11837
## theta (batch 1): 0.0110468
## betas:    1.2653  -0.1990   0.2240  -0.6145  -0.0500   1.3132   1.3975   0.3377   1.6615   0.4021   (
##
## sigma: 0.270924
## lambda (gene 1): 0.289133
## epsilon (gene 1): 0.29977
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 11560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 647.321
## delta (gene 1): 13.0552
## s (cell 1): 1.08211
## nu (cell 1): 1.03825
## theta (batch 1): 0.00338688
## betas:    1.8209  -0.2921  -0.9100  -0.9150   0.6830   0.3755   1.1933   0.8698   0.9336   1.0938  -(
##
## sigma: 0.265404
## lambda (gene 1): 1.16746
## epsilon (gene 1): 0.613745
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 11600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.941
## delta (gene 1): 8.40564
## s (cell 1): 1.0973
## nu (cell 1): 1.04424
## theta (batch 1): 0.00146386
## betas:    1.6377  -0.2121  -0.1282  -0.7949   0.1713   1.0428   1.1324   0.4241   1.3083   0.7167  -(
##
```

```
## sigma: 0.267402
## lambda (gene 1): 1.33211
## epsilon (gene 1): -0.187554
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 11640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 508.06
## delta (gene 1): 13.2942
## s (cell 1): 1.02735
## nu (cell 1): 1.01791
## theta (batch 1): 0.00142502
## betas:    1.0232  -0.2518  -0.4585   0.1435  -0.1437   1.1923   1.2944   0.9762   1.1863   1.4415  -(
##
## sigma: 0.272497
## lambda (gene 1): 0.933812
## epsilon (gene 1): 0.289275
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 11680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 607.692
## delta (gene 1): 8.89708
## s (cell 1): 1.07991
## nu (cell 1): 1.05715
## theta (batch 1): 0.00169081
## betas:    0.9366  -0.1697   0.0112  -0.1588   0.7808   0.8866   1.4241   0.9291   1.1306   0.9358  -(
##
## sigma: 0.276023
## lambda (gene 1): 1.07079
## epsilon (gene 1): 0.470832
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 11720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 617.734
```

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## delta (gene 1): 13.5749
## s (cell 1): 0.980183
## nu (cell 1): 0.997924
## theta (batch 1): 0.00122683
## betas:    0.8026  -0.2234   0.0034   0.2455  -0.0841   0.9010   1.5449   0.9621   1.3993   1.0862   (
##
## sigma: 0.257212
## lambda (gene 1): 0.642687
## epsilon (gene 1): 0.942495
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 11760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 328.17
## delta (gene 1): 12.2577
## s (cell 1): 1.00044
## nu (cell 1): 0.996979
## theta (batch 1): 0.00107455
## betas:    1.3639  -0.2221  -0.7074   0.0576  -0.2228   1.2691   1.1415   0.6320   1.5980   0.2140   (
##
## sigma: 0.244821
## lambda (gene 1): 0.282877
## epsilon (gene 1): 0.54098
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.3
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 11800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 444.64
## delta (gene 1): 13.1198
## s (cell 1): 0.947089
## nu (cell 1): 1.02137
## theta (batch 1): 0.00216519
## betas:    0.8908  -0.1687  -0.5585   0.0952   0.6265   0.8903   1.4164   0.9407   1.1544   1.0370  -(
##
## sigma: 0.307759
## lambda (gene 1): 1.08285
## epsilon (gene 1): 0.478835
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
```

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## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 11840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 656.042
## delta (gene 1): 10.5225
## s (cell 1): 0.935917
## nu (cell 1): 1.01378
## theta (batch 1): 0.01945
## betas:    1.4446  -0.3275   0.3748  -0.4492  -1.0006   1.4251   1.0219   1.0518   1.2638   0.9288   (
##
## sigma: 0.252159
## lambda (gene 1): 1.72016
## epsilon (gene 1): 0.289118
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 11880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 550.975
## delta (gene 1): 8.02995
## s (cell 1): 1.07533
## nu (cell 1): 1.12628
## theta (batch 1): 0.00898984
## betas:    1.3365  -0.1071  -0.1128   0.4241  -0.2624   0.9996   1.5888   0.3770   1.0102   0.6998   -(
##
## sigma: 0.254046
## lambda (gene 1): 1.67525
## epsilon (gene 1): 0.662313
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ----------------------------------------------------------
## Iteration 11920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 274.399
## delta (gene 1): 8.23902
## s (cell 1): 0.932516
## nu (cell 1): 1.06452
## theta (batch 1): 0.0100494
## betas:    0.5193  -0.2838   0.0840   0.2471  -0.2722   1.6531   1.4698   1.2612   1.3220   1.4204   (
##
## sigma: 0.252012
## lambda (gene 1): 1.21799
```

```
## epsilon (gene 1): -0.0713737
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 11960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 488.001
## delta (gene 1): 8.58646
## s (cell 1): 1.07569
## nu (cell 1): 1.06949
## theta (batch 1): 0.0141123
## betas:    0.9003  -0.2501   0.1724  -0.0554  -0.5866   2.0628   0.8641   1.2154   1.3455   1.0313  -0
##
## sigma: 0.26609
## lambda (gene 1): 1.27485
## epsilon (gene 1): 0.455233
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.3
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 12000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 652.621
## delta (gene 1): 9.22285
## s (cell 1): 1.23052
## nu (cell 1): 1.0504
## theta (batch 1): 0.0153222
## betas:    1.0498  -0.3349  -0.2750  -0.2427  -0.5300   1.8085   0.9882   0.9227   1.9626   0.4446   (
##
## sigma: 0.279481
## lambda (gene 1): 1.77491
## epsilon (gene 1): 0.606578
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 12040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 527.33
## delta (gene 1): 10.9825
## s (cell 1): 1.16181
```

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## nu (cell 1): 1.08215
## theta (batch 1): 0.0111722
## betas:    0.9237  -0.2187   0.2484   0.1728  -0.5007   1.8249   0.9807   1.0231   1.4238   0.8206
##
## sigma: 0.249919
## lambda (gene 1): 0.319873
## epsilon (gene 1): 0.769845
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 12080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 738.421
## delta (gene 1): 15.4511
## s (cell 1): 1.16533
## nu (cell 1): 1.09313
## theta (batch 1): 0.0198637
## betas:    1.2008  -0.2434   0.8724  -0.4531  -0.3488   0.9362   1.5596   0.8191   1.1727   1.2347  -(
##
## sigma: 0.249479
## lambda (gene 1): 1.24785
## epsilon (gene 1): 0.0713314
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 12120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 296.737
## delta (gene 1): 12.5051
## s (cell 1): 1.2913
## nu (cell 1): 1.03353
## theta (batch 1): 0.01548
## betas:    1.7051  -0.2843  -0.3560  -0.7118   0.6049   0.5879   1.1590   0.8997   0.9341   1.0446  -(
##
## sigma: 0.275996
## lambda (gene 1): 0.493812
## epsilon (gene 1): 0.613397
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
```

```
## Iteration 12160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 536.075
## delta (gene 1): 12.7275
## s (cell 1): 0.98784
## nu (cell 1): 1.07252
## theta (batch 1): 0.013378
## betas:    1.3521  -0.2665  -0.1762   0.6574  -0.8246   1.4176   0.9445   0.9290   1.3813   0.6223  (
##
## sigma: 0.259447
## lambda (gene 1): 0.949037
## epsilon (gene 1): 0.473652
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 12200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 679.2
## delta (gene 1): 9.55046
## s (cell 1): 1.32118
## nu (cell 1): 0.989137
## theta (batch 1): 0.137523
## betas:    1.7571  -0.3842   0.3731  -0.6730  -0.0324   0.5841   1.1904   1.0279   1.0596   1.2647  (
##
## sigma: 0.285972
## lambda (gene 1): 0.587586
## epsilon (gene 1): 0.500474
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 12240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 533.423
## delta (gene 1): 11.155
## s (cell 1): 0.881611
## nu (cell 1): 1.00892
## theta (batch 1): 0.00676126
## betas:    0.9855  -0.2593  -0.1219   0.2364  -0.2546   1.4116   1.2963   0.9078   1.4571   0.9308  (
##
## sigma: 0.249827
## lambda (gene 1): 0.77333
## epsilon (gene 1): 0.700031
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## ------------------------------------------------------
## Iteration 12280 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 388.636
## delta (gene 1): 12.2734
## s (cell 1): 0.901784
## nu (cell 1): 1.02277
## theta (batch 1): 0.0133445
## betas:    0.6576  -0.1693   0.3583  -0.0898   0.2885   1.1364   1.3557   1.0476   1.2977   1.0337   (
##
## sigma: 0.256747
## lambda (gene 1): 0.403165
## epsilon (gene 1): 0.176836
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.3
## ------------------------------------------------------
## Iteration 12320 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.961
## delta (gene 1): 14.5972
## s (cell 1): 1.11523
## nu (cell 1): 1.12905
## theta (batch 1): 0.0104259
## betas:    1.0317  -0.1072  -0.3916   1.2112  -0.1473   1.2802   1.3633   0.6029   1.2766   0.4718  -(
##
## sigma: 0.249801
## lambda (gene 1): 0.601511
## epsilon (gene 1): 0.948557
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.2
## ------------------------------------------------------
## Iteration 12360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 377.732
## delta (gene 1): 11.5422
## s (cell 1): 1.1979
## nu (cell 1): 1.05632
## theta (batch 1): 0.0115817
```

```
## betas:     1.0070  -0.2475  -0.1825   0.0451   0.5753   0.5634   1.7908   0.6914   1.5022   0.8651  -(
##
## sigma: 0.260142
## lambda (gene 1): 1.76919
## epsilon (gene 1): 0.238206
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## --------------------------------------------------------
## Iteration 12400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 469.776
## delta (gene 1): 11.9704
## s (cell 1): 1.15059
## nu (cell 1): 1.16302
## theta (batch 1): 0.0131662
## betas:     1.1901  -0.2317   0.2799  -0.4187   0.1824   1.2700   1.1306   0.8362   1.3902   0.8214  -(
##
## sigma: 0.262231
## lambda (gene 1): 1.21087
## epsilon (gene 1): 0.480628
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 12440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 472.894
## delta (gene 1): 13.0458
## s (cell 1): 1.17581
## nu (cell 1): 1.06828
## theta (batch 1): 0.0527292
## betas:     0.7896  -0.0922   0.1947   0.5864   0.4046   1.0724   1.5534   0.8522   1.0399   0.8264  -(
##
## sigma: 0.254129
## lambda (gene 1): 1.82726
## epsilon (gene 1): 0.578244
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 12480 out of 40000 has been completed.
## --------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 676.981
## delta (gene 1): 6.48732
## s (cell 1): 1.02099
## nu (cell 1): 1.07364
## theta (batch 1): 0.0158144
## betas:    1.4183  -0.3205  -0.0179  -0.7900   0.1037   1.2725   1.1961   0.5923   1.7508   0.6239   (
##
## sigma: 0.262701
## lambda (gene 1): 0.68495
## epsilon (gene 1): -0.535592
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 12520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 413.037
## delta (gene 1): 10.5844
## s (cell 1): 1.20574
## nu (cell 1): 1.01118
## theta (batch 1): 0.0579358
## betas:    0.8541  -0.2218  -0.3141   0.5088  -0.3398   0.7563   1.8675   0.8068   1.2716   1.3403  -(
##
## sigma: 0.256619
## lambda (gene 1): 1.61548
## epsilon (gene 1): 0.258065
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 12560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 548.542
## delta (gene 1): 10.226
## s (cell 1): 1.15015
## nu (cell 1): 1.05772
## theta (batch 1): 0.0207188
## betas:    1.5030  -0.1958  -1.3751   0.4244  -0.4887   1.2030   1.0175   0.9017   0.8007   1.0744  -(
##
## sigma: 0.24677
## lambda (gene 1): 2.25467
## epsilon (gene 1): 0.183033
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
```

```
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 12600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 565.312
## delta (gene 1): 11.8884
## s (cell 1): 1.24467
## nu (cell 1): 1.05344
## theta (batch 1): 0.0163448
## betas:    1.2585  -0.1831  -0.5239  -0.3093   0.2625   1.2004   1.2308   0.7003   1.2325   0.6782  -(
##
## sigma: 0.296524
## lambda (gene 1): 0.839973
## epsilon (gene 1): 0.614766
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 12640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 522.767
## delta (gene 1): 10.3485
## s (cell 1): 0.880543
## nu (cell 1): 1.03344
## theta (batch 1): 0.023879
## betas:    0.6879  -0.1333   0.0428  -0.7203   1.1911   1.0900   1.4213   0.9226   1.2410   0.8190  -(
##
## sigma: 0.253396
## lambda (gene 1): 0.353366
## epsilon (gene 1): 0.47357
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 12680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 453.494
## delta (gene 1): 8.31864
## s (cell 1): 0.929884
## nu (cell 1): 1.05896
## theta (batch 1): 0.016912
## betas:    1.2044  -0.2757  -0.0045  -0.3913   0.0675   0.5086   2.0264   0.4142   1.5938   0.8752   (
##
```

```
## sigma: 0.267991
## lambda (gene 1): 1.69718
## epsilon (gene 1): -0.0124877
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 12720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 679.28
## delta (gene 1): 7.8739
## s (cell 1): 1.00674
## nu (cell 1): 1.02684
## theta (batch 1): 0.027125
## betas:    0.8850  -0.2846   0.5556  -0.2204  -0.1486   1.3175   1.5484   0.6812   1.8487   0.8241   (
##
## sigma: 0.258592
## lambda (gene 1): 0.732823
## epsilon (gene 1): 0.334892
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 12760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 606.633
## delta (gene 1): 9.38688
## s (cell 1): 1.11637
## nu (cell 1): 1.08884
## theta (batch 1): 0.0225586
## betas:    1.0892  -0.2236   0.1330  -0.4297  -0.0335   1.1155   1.4466   0.6613   1.4122   1.0490  -(
##
## sigma: 0.260818
## lambda (gene 1): 2.26019
## epsilon (gene 1): 0.258622
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 12800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 392.958
```

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## delta (gene 1): 8.51428
## s (cell 1): 0.890541
## nu (cell 1): 1.05764
## theta (batch 1): 0.0376769
## betas:    1.3198  -0.1694  -0.5627   0.1139  -0.2178   1.4268   1.1284   0.3699   1.8204  -0.0435   (
##
## sigma: 0.279999
## lambda (gene 1): 0.547504
## epsilon (gene 1): -0.164548
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 12840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 454.608
## delta (gene 1): 11.3722
## s (cell 1): 1.04292
## nu (cell 1): 1.0824
## theta (batch 1): 0.0363416
## betas:    0.7832  -0.0946  -0.2160   0.4634   0.4258   1.2896   1.1647   1.0669   1.0251   0.9022  -(
##
## sigma: 0.265876
## lambda (gene 1): 1.68235
## epsilon (gene 1): 0.14333
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 12880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 485.498
## delta (gene 1): 9.72999
## s (cell 1): 0.948821
## nu (cell 1): 0.968504
## theta (batch 1): 0.0166993
## betas:    1.3650  -0.3512  -0.3550  -0.5672  -0.3174   1.3476   1.2407   0.9531   1.2607   1.3205   (
##
## sigma: 0.262481
## lambda (gene 1): 1.3188
## epsilon (gene 1): 0.478312
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
```

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## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 12920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 757.947
## delta (gene 1): 10.825
## s (cell 1): 0.890421
## nu (cell 1): 1.07137
## theta (batch 1): 0.0156182
## betas:    1.4836  -0.1667   0.5801  -0.5138  -0.0573   0.8965   1.5483   0.3175   1.1044   1.1683  -
##
## sigma: 0.266233
## lambda (gene 1): 1.06103
## epsilon (gene 1): 0.513075
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 12960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 511.669
## delta (gene 1): 10.7105
## s (cell 1): 1.056
## nu (cell 1): 1.05703
## theta (batch 1): 0.0233775
## betas:    1.5863  -0.2555   0.3065  -0.4917  -0.1976   1.3436   0.9230   0.8793   1.0156   1.1860  -
##
## sigma: 0.26213
## lambda (gene 1): 0.364572
## epsilon (gene 1): 0.026725
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 13000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 366.731
## delta (gene 1): 13.8506
## s (cell 1): 1.21258
## nu (cell 1): 1.00053
## theta (batch 1): 0.028629
## betas:    1.3326  -0.2004   1.8479   0.1254  -0.5659   1.5325   1.0562   0.5142   1.8158  -0.2204   (
##
## sigma: 0.272569
## lambda (gene 1): 1.06896
```

```
## epsilon (gene 1): 0.863621
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## -----------------------------------------------------------
## Iteration 13040 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 587.727
## delta (gene 1): 9.26655
## s (cell 1): 1.20009
## nu (cell 1): 1.115
## theta (batch 1): 0.099814
## betas:    1.2748  -0.3029   0.1148   0.0730   0.0425   1.2359   0.9362   1.3042   1.0291   1.0314   (
##
## sigma: 0.259754
## lambda (gene 1): 0.377299
## epsilon (gene 1): 0.423145
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## -----------------------------------------------------------
## Iteration 13080 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 340.941
## delta (gene 1): 16.1722
## s (cell 1): 1.06937
## nu (cell 1): 1.03769
## theta (batch 1): 0.00805666
## betas:    1.3007  -0.2862   0.5916   0.0381  -0.2948   1.1733   1.4307   0.6683   1.4151   1.0885  -(
##
## sigma: 0.263811
## lambda (gene 1): 0.498512
## epsilon (gene 1): 0.56449
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.3
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.9
## -----------------------------------------------------------
## Iteration 13120 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 558.53
## delta (gene 1): 10.3609
## s (cell 1): 0.969727
```

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## nu (cell 1): 1.03418
## theta (batch 1): 0.00515452
## betas:    1.0505  -0.0473   0.6579   0.2977   0.2432   1.0342   1.6825   0.2562   1.1490   0.9189  -
##
## sigma: 0.236632
## lambda (gene 1): 1.17197
## epsilon (gene 1): 0.466817
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 13160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 465.873
## delta (gene 1): 10.441
## s (cell 1): 1.2566
## nu (cell 1): 1.02383
## theta (batch 1): 0.0121081
## betas:    1.4619  -0.2757   0.6668  -0.1245  -0.2343   0.6160   1.5785   0.7317   1.0931   1.3059  -
##
## sigma: 0.272118
## lambda (gene 1): 1.0135
## epsilon (gene 1): 0.227837
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.3
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 13200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 328.151
## delta (gene 1): 8.82156
## s (cell 1): 1.27355
## nu (cell 1): 1.10239
## theta (batch 1): 0.0154155
## betas:    1.1257  -0.2216   0.4859  -0.4176   0.0714   1.3917   1.1830   0.7197   1.5229   0.7643  -
##
## sigma: 0.291984
## lambda (gene 1): 2.2423
## epsilon (gene 1): 0.0998945
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
```

```
## Iteration 13240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 142.924
## delta (gene 1): 12.5901
## s (cell 1): 0.944614
## nu (cell 1): 1.04125
## theta (batch 1): 0.0120719
## betas:    1.3235  -0.1340  -0.1232  -0.0527  -0.1210   1.4418   1.0151   0.6104   1.2633   0.4217  -(
##
## sigma: 0.264001
## lambda (gene 1): 2.45347
## epsilon (gene 1): 0.479799
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 13280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 372.719
## delta (gene 1): 10.2002
## s (cell 1): 0.949077
## nu (cell 1): 1.03883
## theta (batch 1): 0.00398501
## betas:    1.3448  -0.2683  -0.2898  -0.8569   0.5691   1.3025   0.8585   0.9531   1.5183   0.4347   (
##
## sigma: 0.256968
## lambda (gene 1): 0.190149
## epsilon (gene 1): 0.528112
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 13320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.876
## delta (gene 1): 11.3906
## s (cell 1): 1.07478
## nu (cell 1): 1.0815
## theta (batch 1): 0.00203332
## betas:    0.9362  -0.2382   0.1946  -0.7205   0.3121   1.5748   1.0026   1.2029   1.0434   1.4557  -(
##
## sigma: 0.258653
## lambda (gene 1): 0.286618
## epsilon (gene 1): 0.755729
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 13360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 688.287
## delta (gene 1): 16.5605
## s (cell 1): 1.22264
## nu (cell 1): 1.12259
## theta (batch 1): 0.0135032
## betas:    1.0894  -0.1155   0.9257  -0.7563   0.2874   1.0427   1.7950   0.1823   1.4400   0.8345  -(
##
## sigma: 0.26751
## lambda (gene 1): 1.24276
## epsilon (gene 1): 0.928475
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 13400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 453.562
## delta (gene 1): 14.1686
## s (cell 1): 1.28108
## nu (cell 1): 1.03071
## theta (batch 1): 0.0188722
## betas:    1.5658  -0.2274  -0.1500  -0.2632  -0.0724   0.4387   1.8829   0.1096   1.4836   0.6696  -(
##
## sigma: 0.284244
## lambda (gene 1): 0.977107
## epsilon (gene 1): 0.579312
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 13440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 488.596
## delta (gene 1): 12.6493
## s (cell 1): 1.24433
## nu (cell 1): 1.13113
## theta (batch 1): 0.00298991
```

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## betas:     1.3994  -0.2357  -0.8679   0.6149  -0.3432   0.5721   1.6936   0.4896   1.3148   0.9766  -(
##
## sigma: 0.246952
## lambda (gene 1): 0.467878
## epsilon (gene 1): 0.498674
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 13480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 472.621
## delta (gene 1): 12.2919
## s (cell 1): 0.976379
## nu (cell 1): 1.01696
## theta (batch 1): 0.00251506
## betas:     1.0072  -0.1803  -0.1766   0.3769   0.0928   1.0657   1.5500   0.5832   1.5172   0.5192  -(
##
## sigma: 0.253103
## lambda (gene 1): 0.122616
## epsilon (gene 1): 0.923212
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 13520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 633.881
## delta (gene 1): 12.2439
## s (cell 1): 1.16365
## nu (cell 1): 1.05989
## theta (batch 1): 0.00484892
## betas:     1.3316  -0.2813  -0.9950  -0.0958   0.2076   0.9295   1.2202   0.9434   1.2531   0.9775  -(
##
## sigma: 0.269893
## lambda (gene 1): 0.823842
## epsilon (gene 1): 0.748725
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 13560 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 398.103
## delta (gene 1): 11.4638
## s (cell 1): 0.932048
## nu (cell 1): 1.08492
## theta (batch 1): 0.0673662
## betas:    1.2350  -0.2194  -0.1075  -0.7375   0.1202   0.9899   1.4504   0.6984   1.3129   0.8410  -(
##
## sigma: 0.261007
## lambda (gene 1): 1.7081
## epsilon (gene 1): 0.431391
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 13600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 311.977
## delta (gene 1): 10.8553
## s (cell 1): 1.28752
## nu (cell 1): 1.05408
## theta (batch 1): 0.0319851
## betas:    1.5629  -0.1902  -0.2439  -0.5508   0.1065   1.3139   0.5420   1.0270   1.0198   0.7045  -(
##
## sigma: 0.287054
## lambda (gene 1): 0.625254
## epsilon (gene 1): 0.3394
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 13640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 318.695
## delta (gene 1): 13.2635
## s (cell 1): 1.1175
## nu (cell 1): 1.01666
## theta (batch 1): 0.0147137
## betas:    0.7805  -0.2238  -0.5873   0.3654  -0.1448   0.8616   1.7606   0.9308   1.1449   1.5279  -(
##
## sigma: 0.244481
## lambda (gene 1): 0.996019
## epsilon (gene 1): 0.552123
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
```

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## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 13680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 903.114
## delta (gene 1): 13.2633
## s (cell 1): 0.850912
## nu (cell 1): 1.05126
## theta (batch 1): 0.0119935
## betas:    0.3882  -0.1625   0.3969  -0.1456   0.6141   1.4291   1.7077   0.7244   1.7047   0.7190   (
##
## sigma: 0.271487
## lambda (gene 1): 0.148838
## epsilon (gene 1): 0.685082
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 13720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 300.904
## delta (gene 1): 8.16142
## s (cell 1): 0.953563
## nu (cell 1): 1.05539
## theta (batch 1): 0.054121
## betas:    1.1701  -0.1019  -0.8227   0.2819   0.2494   1.1515   1.2723   0.8404   0.6536   1.2466   -1
##
## sigma: 0.261951
## lambda (gene 1): 2.01503
## epsilon (gene 1): 0.581811
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 13760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 483.605
## delta (gene 1): 11.7105
## s (cell 1): 1.89152
## nu (cell 1): 1.13731
## theta (batch 1): 0.0728441
## betas:    1.2022  -0.2790  -0.0479  -0.2016  -0.0656   1.2127   1.2234   0.8228   1.5833   0.6652   (
##
```

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## sigma: 0.260159
## lambda (gene 1): 0.456253
## epsilon (gene 1): 1.35421
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 13800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 540.663
## delta (gene 1): 9.88717
## s (cell 1): 1.67213
## nu (cell 1): 1.08377
## theta (batch 1): 0.0463759
## betas:    0.7312  -0.2259   0.5333   0.1630  -0.0014   1.0464   1.8200   0.5312   1.7453   1.0186  -(
##
## sigma: 0.279257
## lambda (gene 1): 0.33484
## epsilon (gene 1): 0.821395
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 13840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 924.744
## delta (gene 1): 11.9863
## s (cell 1): 0.819562
## nu (cell 1): 1.02042
## theta (batch 1): 0.0627212
## betas:    0.5635  -0.1907   0.2467  -0.3719   0.2970   1.1227   1.7686   0.7729   1.6106   0.9769  -(
##
## sigma: 0.271584
## lambda (gene 1): 0.498032
## epsilon (gene 1): 1.03856
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 13880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 319.41
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## delta (gene 1): 9.08739
## s (cell 1): 1.46139
## nu (cell 1): 1.05616
## theta (batch 1): 0.0632355
## betas:    0.8855  -0.1791   0.5320  -0.3388  -0.2656   1.6615   1.2570   0.7797   1.4583   0.6935   (
##
## sigma: 0.253779
## lambda (gene 1): 1.03161
## epsilon (gene 1): 0.458233
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 13920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 716.768
## delta (gene 1): 8.0193
## s (cell 1): 0.960852
## nu (cell 1): 1.0786
## theta (batch 1): 0.0620364
## betas:    1.9181  -0.2973  -0.8866  -0.6004  -0.0933   0.8344   1.0344   0.7985   0.7641   1.5414   -
##
## sigma: 0.269329
## lambda (gene 1): 2.04081
## epsilon (gene 1): 0.260628
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 13960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 497.052
## delta (gene 1): 11.6088
## s (cell 1): 0.882014
## nu (cell 1): 1.05937
## theta (batch 1): 0.0394371
## betas:    1.0948  -0.2807  -0.4283  -0.2160  -0.0322   1.4385   1.0352   1.0834   1.3818   1.0508   -(
##
## sigma: 0.24773
## lambda (gene 1): 1.53545
## epsilon (gene 1): 0.13714
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
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## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 14000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 555.507
## delta (gene 1): 14.9792
## s (cell 1): 0.914571
## nu (cell 1): 1.01715
## theta (batch 1): 0.022937
## betas:    1.4996  -0.3054  -0.0775  -0.5927  -0.1223   0.9931   1.1830   0.9449   1.0299   1.2386  -(
##
## sigma: 0.288379
## lambda (gene 1): 0.375709
## epsilon (gene 1): 0.821322
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 14040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 476.479
## delta (gene 1): 9.82156
## s (cell 1): 0.986725
## nu (cell 1): 1.10323
## theta (batch 1): 0.0175345
## betas:    1.3854  -0.1608   0.4828  -0.2828   0.3372   0.9274   1.3309   0.6043   1.2116   0.4825  -(
##
## sigma: 0.247413
## lambda (gene 1): 1.46157
## epsilon (gene 1): 0.398147
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 14080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 758.142
## delta (gene 1): 11.4353
## s (cell 1): 0.865818
## nu (cell 1): 1.02294
## theta (batch 1): 0.0498976
## betas:    2.2617  -0.2761   0.4370  -0.1169  -0.7111   0.8318   1.0845   0.1477   1.5212   0.1581  -(
##
## sigma: 0.249891
## lambda (gene 1): 0.919177
```

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## epsilon (gene 1): 0.267364
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 14120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 560.819
## delta (gene 1): 9.11227
## s (cell 1): 0.920043
## nu (cell 1): 1.04303
## theta (batch 1): 0.0150003
## betas:    1.4184  -0.1965  -0.0013   0.8293  -0.4582   0.5446   1.7291   0.4389   1.2484   0.8110  -(
##
## sigma: 0.249398
## lambda (gene 1): 1.36813
## epsilon (gene 1): 0.317703
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 14160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 449.621
## delta (gene 1): 7.55604
## s (cell 1): 0.894885
## nu (cell 1): 1.03079
## theta (batch 1): 0.0585496
## betas:    1.1893  -0.1331   0.2675   0.2488   0.3533   0.5507   1.6662   0.6106   0.9718   1.1372  -(
##
## sigma: 0.257614
## lambda (gene 1): 0.388292
## epsilon (gene 1): 0.429303
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 14200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 429.64
## delta (gene 1): 11.3678
## s (cell 1): 1.25887
```

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## nu (cell 1): 1.06828
## theta (batch 1): 0.109227
## betas:     1.5100  -0.2769   0.0327   0.1245  -0.1860   0.7292   1.5441   0.4377   1.4769   0.7972  -(
##
## sigma: 0.277154
## lambda (gene 1): 3.18445
## epsilon (gene 1): 0.261269
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 14240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 399.516
## delta (gene 1): 11.671
## s (cell 1): 1.31951
## nu (cell 1): 0.985872
## theta (batch 1): 0.0407385
## betas:     1.7721  -0.2792   0.1524   0.0753  -0.2008   0.5473   1.2964   0.8544   0.7798   1.2815  -(
##
## sigma: 0.261106
## lambda (gene 1): 1.53579
## epsilon (gene 1): 0.297339
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 14280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 398.606
## delta (gene 1): 6.8908
## s (cell 1): 1.56588
## nu (cell 1): 1.14979
## theta (batch 1): 0.0342293
## betas:     1.8630  -0.2658   0.0067  -0.3956  -0.5127   1.5539   0.7766   0.7331   1.0883   0.7395  -(
##
## sigma: 0.269526
## lambda (gene 1): 0.892128
## epsilon (gene 1): 0.149654
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## -------------------------------------------------------
```

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## Iteration 14320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.738
## delta (gene 1): 11.2726
## s (cell 1): 0.975965
## nu (cell 1): 1.08172
## theta (batch 1): 0.0428856
## betas:    2.0560  -0.2648  -0.3023  -0.6503   0.0528   0.3959   1.3110   0.5027   0.9557   0.8709  -(
##
## sigma: 0.264308
## lambda (gene 1): 1.08407
## epsilon (gene 1): 0.633817
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 14360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 912.199
## delta (gene 1): 11.4815
## s (cell 1): 1.06776
## nu (cell 1): 1.12695
## theta (batch 1): 0.0516494
## betas:    1.7724  -0.2604   0.3199  -0.6250  -0.6652   0.7543   1.2363   0.6797   0.9750   1.1611  -(
##
## sigma: 0.255205
## lambda (gene 1): 0.886871
## epsilon (gene 1): 0.353058
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.3
## --------------------------------------------------------
## Iteration 14400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 376.665
## delta (gene 1): 9.7565
## s (cell 1): 1.38024
## nu (cell 1): 1.13425
## theta (batch 1): 0.0176746
## betas:    1.5486  -0.3173   0.0439  -0.5489  -0.5926   1.1159   1.1815   0.6980   1.5981   0.5551   (
##
## sigma: 0.279112
## lambda (gene 1): 0.611939
## epsilon (gene 1): -0.0063526
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 14440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 491.616
## delta (gene 1): 12.6053
## s (cell 1): 0.669397
## nu (cell 1): 0.989308
## theta (batch 1): 0.0291286
## betas:    1.1527  -0.2900   0.0082  -0.4237  -0.2742   1.6780   1.1302   0.8616   1.5385   0.9435  -(
##
## sigma: 0.253211
## lambda (gene 1): 1.14157
## epsilon (gene 1): 0.2852
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 14480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.915
## delta (gene 1): 9.15411
## s (cell 1): 1.02876
## nu (cell 1): 1.06838
## theta (batch 1): 0.0169046
## betas:    1.2242  -0.2357  -0.0095  -0.3324   0.1051   1.3031   1.1325   1.0335   1.0075   1.0275  -(
##
## sigma: 0.256604
## lambda (gene 1): 0.327701
## epsilon (gene 1): 0.343746
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 14520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 440.763
## delta (gene 1): 9.99591
## s (cell 1): 0.794148
## nu (cell 1): 1.00354
## theta (batch 1): 0.0337052
```

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## betas:     1.6429  -0.1649   0.0892  -0.1421   0.0252   1.1269   1.2322   0.3465   1.2233   0.3623  -0
##
## sigma: 0.263686
## lambda (gene 1): 0.9312
## epsilon (gene 1): 0.399421
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 14560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 437.216
## delta (gene 1): 8.72364
## s (cell 1): 0.966276
## nu (cell 1): 1.03362
## theta (batch 1): 0.00539822
## betas:     1.6037  -0.2877  -0.3015   0.1266  -0.8438   0.9678   1.0296   0.8020   1.3898   0.6358  (
##
## sigma: 0.261847
## lambda (gene 1): 1.39288
## epsilon (gene 1): 0.419737
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 14600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 526.409
## delta (gene 1): 11.894
## s (cell 1): 1.12099
## nu (cell 1): 1.05449
## theta (batch 1): 0.00607565
## betas:     2.0432  -0.2568   0.2670  -0.4615   0.0943   0.3040   1.3541   0.4646   0.8638   1.0283  -0
##
## sigma: 0.273911
## lambda (gene 1): 0.529306
## epsilon (gene 1): 0.579804
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 14640 out of 40000 has been completed.
## -------------------------------------------------------
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## Current draws for selected parameters are displayed below.
## mu (gene 1): 413.984
## delta (gene 1): 11.5989
## s (cell 1): 1.33016
## nu (cell 1): 1.03723
## theta (batch 1): 0.0176659
## betas:    1.2289  -0.2206   1.1260  -0.6494  -0.0064   1.3294   1.0346   0.9343   1.3245   0.6502   (
##
## sigma: 0.244911
## lambda (gene 1): 1.16815
## epsilon (gene 1): 0.595304
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 14680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 671.234
## delta (gene 1): 8.94964
## s (cell 1): 0.961643
## nu (cell 1): 0.970865
## theta (batch 1): 0.078624
## betas:    1.6973  -0.2188   0.4707  -0.4070  -0.0654   0.9188   1.2575   0.4832   1.2352   0.5439  -(
##
## sigma: 0.267048
## lambda (gene 1): 1.19434
## epsilon (gene 1): 0.207728
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 14720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 436.773
## delta (gene 1): 10.0352
## s (cell 1): 0.606594
## nu (cell 1): 1.10176
## theta (batch 1): 0.11976
## betas:    1.6704  -0.2216   0.3689  -0.0392  -0.5453   1.2344   1.1149   0.5753   1.1427   0.8566  -(
##
## sigma: 0.272396
## lambda (gene 1): 0.886687
## epsilon (gene 1): 0.0636393
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
```

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## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 14760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 624.424
## delta (gene 1): 9.961
## s (cell 1): 1.16631
## nu (cell 1): 1.07324
## theta (batch 1): 0.0346935
## betas:    1.3628   -0.2772    0.0679   -0.3619   -0.1671    1.4736    1.2960    0.4582    1.6369    0.8050   -(
##
## sigma: 0.271882
## lambda (gene 1): 1.69186
## epsilon (gene 1): 0.156869
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 14800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 454.022
## delta (gene 1): 7.641
## s (cell 1): 1.01536
## nu (cell 1): 0.943295
## theta (batch 1): 0.0088998
## betas:    1.3053   -0.1831    0.5631   -1.2736    0.9970    1.0547    1.1277    0.8646    0.9245    0.9975   -(
##
## sigma: 0.263847
## lambda (gene 1): 0.358332
## epsilon (gene 1): -0.0431122
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 14840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 382.761
## delta (gene 1): 12.4144
## s (cell 1): 0.968286
## nu (cell 1): 1.05077
## theta (batch 1): 0.0236911
## betas:    1.0530   -0.2379    0.5519   -0.3590    0.4429    1.1874    1.4887    0.5481    1.8148    0.3168    (
##
```

```
## sigma: 0.265035
## lambda (gene 1): 1.8523
## epsilon (gene 1): 0.494638
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 14880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 485.768
## delta (gene 1): 10.0828
## s (cell 1): 1.03714
## nu (cell 1): 1.14529
## theta (batch 1): 0.0220155
## betas:    1.1861  -0.4025  -0.7110   0.0310  -0.1186   0.9577   1.4531   1.2625   1.3968   1.0134   (
##
## sigma: 0.263742
## lambda (gene 1): 1.09707
## epsilon (gene 1): 0.698612
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 14920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 427.176
## delta (gene 1): 12.9036
## s (cell 1): 1.22179
## nu (cell 1): 1.10539
## theta (batch 1): 0.0120357
## betas:    1.1797  -0.2862  -0.0903  -0.3468  -0.1876   1.0739   1.7369   0.3123   1.9441   0.6362   (
##
## sigma: 0.272364
## lambda (gene 1): 0.928566
## epsilon (gene 1): 0.471333
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 14960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 442.759
```

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## delta (gene 1): 8.57184
## s (cell 1): 1.15306
## nu (cell 1): 1.0603
## theta (batch 1): 0.0120736
## betas:    1.4817  -0.2078   1.0404  -0.7730  -0.3673   1.6784   0.5708   1.2444   0.7256   0.9629  -0
##
## sigma: 0.272199
## lambda (gene 1): 1.88415
## epsilon (gene 1): -0.0498128
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 15000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 436.964
## delta (gene 1): 10.6825
## s (cell 1): 1.01983
## nu (cell 1): 1.09042
## theta (batch 1): 0.0160824
## betas:    1.8334  -0.3234   0.3280  -0.8578  -0.0715   0.6251   1.5358   0.3807   1.3548   0.8885  -0
##
## sigma: 0.288907
## lambda (gene 1): 1.12846
## epsilon (gene 1): 0.30291
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 15040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 611.432
## delta (gene 1): 15.1898
## s (cell 1): 1.11668
## nu (cell 1): 1.02291
## theta (batch 1): 0.0107619
## betas:    1.0968  -0.2717   0.3451  -0.8211   0.7349   0.9520   1.1756   1.2349   1.0918   1.1744  -0
##
## sigma: 0.260033
## lambda (gene 1): 0.448698
## epsilon (gene 1): 0.654058
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
```

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## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 15080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 453.444
## delta (gene 1): 10.4482
## s (cell 1): 1.35495
## nu (cell 1): 1.07913
## theta (batch 1): 0.0218239
## betas:    1.7814  -0.1938   0.8367  -1.0091   0.2475   0.6387   1.2858   0.4446   1.1262   0.6279  -(
##
## sigma: 0.278438
## lambda (gene 1): 2.63843
## epsilon (gene 1): 0.180174
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 15120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 485.085
## delta (gene 1): 8.64062
## s (cell 1): 1.0809
## nu (cell 1): 1.09535
## theta (batch 1): 0.0350669
## betas:    0.8443  -0.2236   0.5751  -0.1631   0.5983   0.8225   1.7783   0.6037   1.6463   0.8883   (
##
## sigma: 0.270525
## lambda (gene 1): 1.77456
## epsilon (gene 1): 0.0734084
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 15160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 542.155
## delta (gene 1): 7.96756
## s (cell 1): 1.17711
## nu (cell 1): 1.02044
## theta (batch 1): 0.00806543
## betas:    1.1083  -0.1486   0.5525   0.0059   0.3385   0.8973   1.5758   0.5810   1.2663   0.5561   (
##
## sigma: 0.255992
## lambda (gene 1): 3.25168
```

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## epsilon (gene 1): 0.222945
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 15200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 603.387
## delta (gene 1): 10.5093
## s (cell 1): 1.07279
## nu (cell 1): 1.02453
## theta (batch 1): 0.0212657
## betas:    1.6414  -0.2761   0.3334  -0.2124  -0.1896   0.9822   1.3084   0.6588   1.0511   1.1774  -(
##
## sigma: 0.278124
## lambda (gene 1): 1.42793
## epsilon (gene 1): -0.0264953
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 15240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 717.106
## delta (gene 1): 10.273
## s (cell 1): 0.900709
## nu (cell 1): 1.07525
## theta (batch 1): 0.0213955
## betas:    1.1224  -0.1389   0.9137   0.1944  -0.4777   2.2809   0.3386   1.1563   1.3371   0.0901   (
##
## sigma: 0.256567
## lambda (gene 1): 0.908646
## epsilon (gene 1): -0.00761596
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 15280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 508.032
## delta (gene 1): 10.9333
## s (cell 1): 0.983497
```

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## nu (cell 1): 1.07494
## theta (batch 1): 0.0475712
## betas:    1.3913  -0.2552   1.1140  -1.1068   0.5371   0.7891   1.3406   0.7910   1.2130   0.9771  -(
##
## sigma: 0.254784
## lambda (gene 1): 0.42753
## epsilon (gene 1): 0.52409
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 15320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 380.112
## delta (gene 1): 9.07886
## s (cell 1): 1.03853
## nu (cell 1): 1.0289
## theta (batch 1): 0.0271231
## betas:    1.1773  -0.2425   0.0134  -0.3481   0.3734   0.9759   1.3596   0.8530   1.2758   0.9425  -(
##
## sigma: 0.263259
## lambda (gene 1): 0.436574
## epsilon (gene 1): 0.0696747
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 15360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 814.783
## delta (gene 1): 7.99408
## s (cell 1): 0.904485
## nu (cell 1): 1.02071
## theta (batch 1): 0.0148867
## betas:    1.2630  -0.1514  -0.0131  -0.8681   0.7109   0.8146   1.1687   1.1480   0.6349   0.9040  -(
##
## sigma: 0.249392
## lambda (gene 1): 1.4788
## epsilon (gene 1): 0.373187
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ----------------------------------------------------------
```

```
## Iteration 15400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 575.901
## delta (gene 1): 12.1507
## s (cell 1): 1.19086
## nu (cell 1): 1.06083
## theta (batch 1): 0.00897157
## betas:    1.2090  -0.3019   0.1367  -1.0167   0.1882   1.1456   1.2895   0.7507   1.6059   0.8616
##
## sigma: 0.270582
## lambda (gene 1): 0.22583
## epsilon (gene 1): 0.678781
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## ---------------------------------------------------------
## Iteration 15440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.378
## delta (gene 1): 7.61918
## s (cell 1): 1.37991
## nu (cell 1): 1.0342
## theta (batch 1): 0.0239548
## betas:    0.8232  -0.2623  -0.5706  -0.7610   0.4854   1.0783   1.3782   0.9803   1.6073   0.8856
##
## sigma: 0.261516
## lambda (gene 1): 1.35596
## epsilon (gene 1): 0.205857
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## ---------------------------------------------------------
## Iteration 15480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 372.708
## delta (gene 1): 9.62998
## s (cell 1): 1.02209
## nu (cell 1): 1.09783
## theta (batch 1): 0.0153332
## betas:    0.5993  -0.1071   0.5377  -0.0415   0.1825   1.3330   1.5477   0.9466   1.0054   1.2111  -0
##
## sigma: 0.253615
## lambda (gene 1): 1.20319
## epsilon (gene 1): 0.073607
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.1
## -------------------------------------------------------
## Iteration 15520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 546.502
## delta (gene 1): 9.60032
## s (cell 1): 0.960716
## nu (cell 1): 0.942239
## theta (batch 1): 0.099803
## betas:    0.7757  -0.2859  -0.5392  -0.0320   0.1332   1.1989   1.6009   1.0206   1.3660   1.3455  -(
##
## sigma: 0.249134
## lambda (gene 1): 1.11033
## epsilon (gene 1): 0.639879
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1
## -------------------------------------------------------
## Iteration 15560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 698.194
## delta (gene 1): 10.5732
## s (cell 1): 0.706843
## nu (cell 1): 1.06107
## theta (batch 1): 0.0753541
## betas:    1.1340  -0.1965   0.1026  -0.3793   0.2326   1.0687   1.4796   0.6858   1.2918   0.8543  -(
##
## sigma: 0.262022
## lambda (gene 1): 0.783313
## epsilon (gene 1): 0.404364
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.1
## -------------------------------------------------------
## Iteration 15600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 494.236
## delta (gene 1): 10.0067
## s (cell 1): 0.892542
## nu (cell 1): 1.11867
## theta (batch 1): 0.0699547
```

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## betas:     1.1201  -0.2635   0.5673  -0.4765   0.1622   1.3874   1.0673   1.2458   0.8694   1.3856  -(
##
## sigma: 0.280782
## lambda (gene 1): 2.1464
## epsilon (gene 1): 0.304195
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## ---------------------------------------------------------
## Iteration 15640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 424.273
## delta (gene 1): 11.3802
## s (cell 1): 0.955363
## nu (cell 1): 1.02809
## theta (batch 1): 0.117375
## betas:     1.5307  -0.2847   0.0849  -0.9267  -0.1559   1.3220   1.0378   0.8811   0.9738   1.4425  -(
##
## sigma: 0.263995
## lambda (gene 1): 1.62671
## epsilon (gene 1): 0.47264
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## ---------------------------------------------------------
## Iteration 15680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1029.14
## delta (gene 1): 10.9015
## s (cell 1): 1.43112
## nu (cell 1): 1.02491
## theta (batch 1): 0.047444
## betas:     1.3077  -0.1844   0.7849  -0.6457   0.1667   1.5450   1.0107   0.6106   1.4097   0.5254  -(
##
## sigma: 0.270631
## lambda (gene 1): 0.410718
## epsilon (gene 1): 1.07119
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 15720 out of 40000 has been completed.
## ---------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 525.742
## delta (gene 1): 9.22708
## s (cell 1): 1.20262
## nu (cell 1): 1.10674
## theta (batch 1): 0.121727
## betas:    1.5624  -0.4350   0.2364  -1.0636  -0.2037   1.0209   1.4927   0.4067   2.0774   0.7122  (
##
## sigma: 0.255716
## lambda (gene 1): 1.67549
## epsilon (gene 1): -0.0718067
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 15760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 348.9
## delta (gene 1): 10.2026
## s (cell 1): 0.955004
## nu (cell 1): 1.1105
## theta (batch 1): 0.0294577
## betas:    1.7075  -0.2819   0.4148  -0.7993  -0.3411   1.4292   0.8849   0.7703   1.3036   0.5373  (
##
## sigma: 0.265895
## lambda (gene 1): 0.799929
## epsilon (gene 1): 0.396211
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 15800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.06
## delta (gene 1): 8.51431
## s (cell 1): 1.07224
## nu (cell 1): 0.997148
## theta (batch 1): 0.0652181
## betas:    1.2866  -0.3694   0.1850  -0.6090  -0.1653   1.3994   1.0534   0.9802   1.7216   0.6400  (
##
## sigma: 0.282565
## lambda (gene 1): 0.614569
## epsilon (gene 1): 0.252773
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
```

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## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 15840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 539.157
## delta (gene 1): 10.3143
## s (cell 1): 0.939513
## nu (cell 1): 1.10138
## theta (batch 1): 0.0992808
## betas:    2.0375  -0.1944   0.3704  -0.7864  -0.3705   1.1402   0.8327   0.5193   1.0989   0.2644  -(
##
## sigma: 0.256916
## lambda (gene 1): 1.08865
## epsilon (gene 1): 0.46358
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
## Iteration 15880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 429.26
## delta (gene 1): 12.9912
## s (cell 1): 1.40465
## nu (cell 1): 1.07595
## theta (batch 1): 0.0364644
## betas:    1.3855  -0.2834   0.6844  -0.6775   0.1787   1.2434   1.1230   0.7246   1.5879   0.6005   (
##
## sigma: 0.248336
## lambda (gene 1): 0.5638
## epsilon (gene 1): 0.370469
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
## Iteration 15920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 319.081
## delta (gene 1): 12.1494
## s (cell 1): 1.59571
## nu (cell 1): 1.07575
## theta (batch 1): 0.118211
## betas:    1.2879  -0.2818  -0.9328   0.6974  -0.1822   0.7850   1.2920   1.0190   1.0377   1.3990  -(
##
```

```
## sigma: 0.269756
## lambda (gene 1): 1.32174
## epsilon (gene 1): 0.682424
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 15960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 446.605
## delta (gene 1): 8.71648
## s (cell 1): 1.12029
## nu (cell 1): 1.03696
## theta (batch 1): 0.0276597
## betas:    1.1725  -0.3340   0.0135  -1.1776   0.5947   1.3118   0.7859   1.3535   1.4468   0.7996
##
## sigma: 0.292237
## lambda (gene 1): 1.20445
## epsilon (gene 1): 0.614181
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 16000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 508.067
## delta (gene 1): 10.5678
## s (cell 1): 1.47115
## nu (cell 1): 1.09832
## theta (batch 1): 0.0623792
## betas:    1.6500  -0.2094  -0.2109  -0.0884  -0.3170   1.3796   0.7030   0.9752   0.8938   0.6231
##
## sigma: 0.28501
## lambda (gene 1): 1.6745
## epsilon (gene 1): 0.362439
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 16040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 284.263
```

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## delta (gene 1): 9.81915
## s (cell 1): 1.29167
## nu (cell 1): 1.09962
## theta (batch 1): 0.0600884
## betas:    1.0060  -0.3045  -0.3053  -0.2337  -0.0955   1.5340   1.1524   1.0321   1.5440   1.0405  -(
##
## sigma: 0.26636
## lambda (gene 1): 0.948267
## epsilon (gene 1): 0.365335
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 16080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 559.739
## delta (gene 1): 10.089
## s (cell 1): 1.04363
## nu (cell 1): 0.984658
## theta (batch 1): 0.0220796
## betas:    1.0530  -0.2066   0.5091  -0.4772   0.5332   0.9983   1.3440   1.0398   0.8952   1.3302  -(
##
## sigma: 0.25545
## lambda (gene 1): 2.01949
## epsilon (gene 1): -0.350439
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 16120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 971.385
## delta (gene 1): 11.8073
## s (cell 1): 0.960545
## nu (cell 1): 1.12143
## theta (batch 1): 0.135224
## betas:    1.5905  -0.1546  -0.2750  -0.3890  -0.1409   1.2223   0.9732   0.5698   1.3280   0.1187  -(
##
## sigma: 0.251756
## lambda (gene 1): 0.670963
## epsilon (gene 1): 0.682189
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
```

```
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 16160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 457.133
## delta (gene 1): 14.1046
## s (cell 1): 1.09734
## nu (cell 1): 1.05272
## theta (batch 1): 0.0592145
## betas:    1.1728  -0.3051   0.0428  -0.7735   0.0488   1.2936   0.9101   1.3381   1.1753   0.9914   (
##
## sigma: 0.242262
## lambda (gene 1): 0.611291
## epsilon (gene 1): 0.86945
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 16200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 644.245
## delta (gene 1): 9.73486
## s (cell 1): 0.860646
## nu (cell 1): 1.00037
## theta (batch 1): 0.0283997
## betas:    1.2749  -0.1202   0.6209  -0.2073  -0.0111   1.1537   1.0549   0.8866   0.8408   1.0429  -(
##
## sigma: 0.280805
## lambda (gene 1): 1.22229
## epsilon (gene 1): 0.351277
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 16240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 499.12
## delta (gene 1): 11.5434
## s (cell 1): 0.884598
## nu (cell 1): 1.01437
## theta (batch 1): 0.033474
## betas:    0.9970  -0.1365   0.7704  -0.1422  -0.0089   1.3589   1.3097   0.6902   1.2973   0.8383  -(
##
## sigma: 0.248981
## lambda (gene 1): 1.69912
```

```
## epsilon (gene 1): 0.507719
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 16280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 610.994
## delta (gene 1): 11.314
## s (cell 1): 1.09535
## nu (cell 1): 1.02944
## theta (batch 1): 0.0903112
## betas:    1.2854  -0.2537  -0.5187  -0.3574   0.4320   1.0874   0.9158   1.3282   0.9387   0.8555   (
##
## sigma: 0.253392
## lambda (gene 1): 0.309065
## epsilon (gene 1): 0.449206
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 16320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.222
## delta (gene 1): 9.60161
## s (cell 1): 0.837171
## nu (cell 1): 1.09177
## theta (batch 1): 0.0297002
## betas:    0.8671  -0.1729  -0.2060   0.1750   0.3256   1.4437   1.1987   0.9585   1.2372   0.9222  -(
##
## sigma: 0.251971
## lambda (gene 1): 0.849216
## epsilon (gene 1): 0.268175
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 16360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.602
## delta (gene 1): 11.1334
## s (cell 1): 0.812694
```

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## nu (cell 1): 1.01419
## theta (batch 1): 0.0314719
## betas:    1.8058  -0.1622  -0.3258   0.5526  -0.3648   0.5918   1.3893   0.5577   0.7174   0.9384   -(
##
## sigma: 0.25951
## lambda (gene 1): 0.675762
## epsilon (gene 1): 0.574184
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.7
## ----------------------------------------------------------
## Iteration 16400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1213.26
## delta (gene 1): 9.64078
## s (cell 1): 1.06704
## nu (cell 1): 1.00056
## theta (batch 1): 0.0374983
## betas:    1.6220  -0.2811  -0.4276  -0.3861   0.1932   1.0061   0.9771   0.7892   1.1801   0.9694   -(
##
## sigma: 0.261207
## lambda (gene 1): 1.8751
## epsilon (gene 1): 0.69674
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 16440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 389.277
## delta (gene 1): 9.52637
## s (cell 1): 1.10822
## nu (cell 1): 1.03826
## theta (batch 1): 0.0727257
## betas:    0.9599  -0.1798   0.5283  -0.1871  -0.0088   1.0694   1.6196   0.5810   1.5257   0.7085   -(
##
## sigma: 0.265479
## lambda (gene 1): 0.919594
## epsilon (gene 1): 0.703991
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
```

```
## Iteration 16480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 610.258
## delta (gene 1): 9.35926
## s (cell 1): 0.908398
## nu (cell 1): 1.05283
## theta (batch 1): 0.0310864
## betas:    1.2731  -0.1859   0.2826  -0.2025   0.1491   0.8221   1.1363   1.0281   0.9921   0.8555  -(
##
## sigma: 0.255014
## lambda (gene 1): 0.904487
## epsilon (gene 1): -0.017447
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 16520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 519.689
## delta (gene 1): 12.3229
## s (cell 1): 1.40189
## nu (cell 1): 1.07939
## theta (batch 1): 0.0112929
## betas:    1.6094  -0.2728   0.3705  -0.0905  -0.6302   0.9107   1.2099   0.7115   1.2525   0.8266  -(
##
## sigma: 0.255115
## lambda (gene 1): 1.0877
## epsilon (gene 1): 0.652835
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 16560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 405.667
## delta (gene 1): 12.22
## s (cell 1): 1.0204
## nu (cell 1): 1.01782
## theta (batch 1): 0.00582241
## betas:    1.5540  -0.2709   0.0621  -0.1112  -0.0494   0.7493   1.3697   0.8260   0.8851   1.4468  -(
##
## sigma: 0.257461
## lambda (gene 1): 0.655285
## epsilon (gene 1): 0.584113
## ----------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 16600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 386.09
## delta (gene 1): 8.24735
## s (cell 1): 1.07872
## nu (cell 1): 1.09548
## theta (batch 1): 0.00873246
## betas:    1.4362  -0.3947  -0.7303   0.0485  -0.8097   1.3658   0.9890   0.9942   1.5749   0.9154   (
##
## sigma: 0.285135
## lambda (gene 1): 0.794692
## epsilon (gene 1): -0.101862
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 16640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 512.313
## delta (gene 1): 8.63503
## s (cell 1): 1.20727
## nu (cell 1): 1.04904
## theta (batch 1): 0.00715118
## betas:    1.3575  -0.2720  -0.0113   0.5254  -0.4685   0.8339   1.5095   0.5807   1.5795   0.6436   (
##
## sigma: 0.248449
## lambda (gene 1): 2.80809
## epsilon (gene 1): -0.00276259
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 16680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 574.67
## delta (gene 1): 9.12664
## s (cell 1): 0.981578
## nu (cell 1): 1.02184
## theta (batch 1): 0.0109919
```

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## betas:    1.2307  -0.2697  -0.2818   1.0531  -1.0362   1.0258   1.7817   0.4424   1.7141   0.4353   (
##
## sigma: 0.260204
## lambda (gene 1): 1.50292
## epsilon (gene 1): 0.600158
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 16720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 572.13
## delta (gene 1): 12.0645
## s (cell 1): 0.986317
## nu (cell 1): 1.03448
## theta (batch 1): 0.00617805
## betas:    1.7776  -0.3822   0.0201  -1.1159  -0.2841   1.0137   0.9911   0.7861   1.5468   0.7670   (
##
## sigma: 0.255326
## lambda (gene 1): 1.28509
## epsilon (gene 1): 0.570916
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 16760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 722.584
## delta (gene 1): 7.922
## s (cell 1): 1.52529
## nu (cell 1): 1.07104
## theta (batch 1): 0.0200353
## betas:    1.0194  -0.4199   0.4956  -1.1771   0.0217   1.1204   1.5190   0.8545   2.0498   0.8750   (
##
## sigma: 0.251694
## lambda (gene 1): 1.69649
## epsilon (gene 1): -0.0666399
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 16800 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 392.69
## delta (gene 1): 9.94694
## s (cell 1): 1.14269
## nu (cell 1): 1.061
## theta (batch 1): 0.0684699
## betas:    1.1558  -0.2583  -0.0092  -0.4228   0.5494   1.0186   1.1892   1.0711   1.0492   1.2838  -(
##
## sigma: 0.271156
## lambda (gene 1): 0.94086
## epsilon (gene 1): 0.13245
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 16840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 883.449
## delta (gene 1): 9.14604
## s (cell 1): 0.861319
## nu (cell 1): 1.09468
## theta (batch 1): 0.0439528
## betas:    0.7548  -0.1347  -0.5099   0.5477   0.1758   1.3157   1.7757   0.4025   1.6610   0.5820  -(
##
## sigma: 0.273724
## lambda (gene 1): 0.83673
## epsilon (gene 1): 0.0698188
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 16880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 559.912
## delta (gene 1): 11.6928
## s (cell 1): 1.20048
## nu (cell 1): 1.03607
## theta (batch 1): 0.0164502
## betas:    1.2117  -0.0364  -0.6569   0.2983   0.1625   1.1156   1.2688   0.6749   0.7543   0.7499  -(
##
## sigma: 0.264844
## lambda (gene 1): 1.53625
## epsilon (gene 1): 0.359428
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
```

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## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 16920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.523
## delta (gene 1): 6.32794
## s (cell 1): 1.26442
## nu (cell 1): 1.01213
## theta (batch 1): 0.0303636
## betas:    1.3888  -0.1034  -0.3771   0.1685  -0.3390   0.9856   1.6967   0.1819   1.1462   0.8481  -
##
## sigma: 0.271663
## lambda (gene 1): 0.922151
## epsilon (gene 1): -0.251384
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 16960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 817.451
## delta (gene 1): 8.86916
## s (cell 1): 1.1232
## nu (cell 1): 1.01475
## theta (batch 1): 0.0146403
## betas:    1.4847  -0.2444  -0.2417  -0.9431   0.2866   0.9003   1.3892   0.6450   1.1471   0.9905  -
##
## sigma: 0.262972
## lambda (gene 1): 0.430862
## epsilon (gene 1): 0.696081
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 17000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 362.997
## delta (gene 1): 9.81293
## s (cell 1): 0.929832
## nu (cell 1): 1.08591
## theta (batch 1): 0.0237836
## betas:    1.4855  -0.2306   0.0285  -0.6842  -0.2656   1.4074   0.9714   0.7632   1.1568   1.0806  -
##
```

```
## sigma: 0.28333
## lambda (gene 1): 1.19646
## epsilon (gene 1): 0.0264127
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 17040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 431.548
## delta (gene 1): 14.7375
## s (cell 1): 1.20279
## nu (cell 1): 1.09186
## theta (batch 1): 0.0140545
## betas:    1.6115  -0.2289   0.3641  -0.9570  -0.4797   1.3908   1.0470   0.5723   1.4349   0.3551   
##
## sigma: 0.255506
## lambda (gene 1): 1.31206
## epsilon (gene 1): 0.475479
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 17080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 458.412
## delta (gene 1): 12.2524
## s (cell 1): 0.973496
## nu (cell 1): 1.02622
## theta (batch 1): 0.0370353
## betas:    1.2613  -0.2804  -0.1632  -0.9257  -0.4479   1.2658   1.4040   0.7326   1.3153   1.2193  -0
##
## sigma: 0.258667
## lambda (gene 1): 0.770077
## epsilon (gene 1): 0.458735
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 17120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1003.49
```

```
## delta (gene 1): 9.8996
## s (cell 1): 1.24425
## nu (cell 1): 1.0654
## theta (batch 1): 0.0180838
## betas:    1.7522  -0.2008  -0.3040  -0.6182  -0.2290   1.0697   1.0341   0.4537   1.4607   0.1128  -(
##
## sigma: 0.254626
## lambda (gene 1): 0.793585
## epsilon (gene 1): 0.820847
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 17160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.602
## delta (gene 1): 10.5973
## s (cell 1): 0.977375
## nu (cell 1): 1.0978
## theta (batch 1): 0.035335
## betas:    1.4945  -0.1663  -0.1911  -0.8725   0.3769   0.8632   1.0589   0.8342   1.0969   0.4887  -(
##
## sigma: 0.281373
## lambda (gene 1): 1.25308
## epsilon (gene 1): 0.16784
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## ------------------------------------------------------
## Iteration 17200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 664.594
## delta (gene 1): 11.873
## s (cell 1): 1.44485
## nu (cell 1): 1.13264
## theta (batch 1): 0.0249788
## betas:    1.5335  -0.3950  -0.5794  -1.0148  -0.0552   1.0930   0.7737   1.0837   1.5890   0.7953   (
##
## sigma: 0.283589
## lambda (gene 1): 0.2035
## epsilon (gene 1): 0.74818
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
```

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## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 17240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 469.616
## delta (gene 1): 7.89797
## s (cell 1): 0.853893
## nu (cell 1): 0.992126
## theta (batch 1): 0.0290943
## betas:    1.3970  -0.1526  -0.5257  -0.0444   0.1123   0.7475   1.4924   0.4497   1.2500   0.6604  -(
##
## sigma: 0.258758
## lambda (gene 1): 1.15859
## epsilon (gene 1): 0.365532
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 17280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 454.443
## delta (gene 1): 12.8904
## s (cell 1): 1.00319
## nu (cell 1): 1.06857
## theta (batch 1): 0.0253217
## betas:    1.0614  -0.2006   0.3432  -0.3032   0.3679   0.9162   1.4706   0.8438   1.0636   1.2767  -(
##
## sigma: 0.277888
## lambda (gene 1): 0.200209
## epsilon (gene 1): 0.697934
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 17320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 569.334
## delta (gene 1): 14.763
## s (cell 1): 1.2486
## nu (cell 1): 1.01499
## theta (batch 1): 0.0521614
## betas:    1.3367  -0.3515   0.0785  -0.6125  -0.0541   1.1291   1.2229   0.8963   1.5433   0.9158   (
##
## sigma: 0.260729
## lambda (gene 1): 0.993298
```

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## epsilon (gene 1): 0.358394
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 17360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 579.717
## delta (gene 1): 10.9373
## s (cell 1): 0.832293
## nu (cell 1): 1.1035
## theta (batch 1): 0.0983884
## betas:    1.6389  -0.2795   0.3555  -0.3530  -0.1918   0.5456   1.3407   0.7713   1.0697   1.0294   (
##
## sigma: 0.266434
## lambda (gene 1): 0.790822
## epsilon (gene 1): 0.52812
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 17400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 333.301
## delta (gene 1): 11.873
## s (cell 1): 0.753041
## nu (cell 1): 1.01407
## theta (batch 1): 0.0561635
## betas:    1.4239  -0.3106   1.0213  -0.6477   0.0080   0.8158   1.0299   1.3856   0.5417   1.8789   -(
##
## sigma: 0.289726
## lambda (gene 1): 1.08818
## epsilon (gene 1): 0.181916
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 17440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 365.397
## delta (gene 1): 15.0752
## s (cell 1): 1.02243
```

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## nu (cell 1): 1.06035
## theta (batch 1): 0.00718736
## betas:     1.9087  -0.3619  -0.1685  -0.1012  -0.4059   0.6525   1.4488   0.3790   1.6175   0.5611   (
##
## sigma: 0.251432
## lambda (gene 1): 0.373017
## epsilon (gene 1): 0.440835
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ------------------------------------------------------------
## Iteration 17480 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 714.56
## delta (gene 1): 8.91918
## s (cell 1): 1.30288
## nu (cell 1): 1.08946
## theta (batch 1): 0.031316
## betas:     1.5446  -0.3434   0.0643  -0.2918  -0.0361   0.3791   1.6845   0.6757   1.3357   1.0051   (
##
## sigma: 0.265062
## lambda (gene 1): 0.671509
## epsilon (gene 1): 0.313698
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ------------------------------------------------------------
## Iteration 17520 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 410.874
## delta (gene 1): 9.60874
## s (cell 1): 1.30715
## nu (cell 1): 1.09833
## theta (batch 1): 0.0202276
## betas:     1.0974  -0.0968  -0.2120  -0.0052   0.4552   1.3453   1.0092   0.8024   1.2347   0.2973  -(
##
## sigma: 0.258497
## lambda (gene 1): 0.84731
## epsilon (gene 1): 0.552581
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.2
## ------------------------------------------------------------
```

```
## Iteration 17560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 705.804
## delta (gene 1): 9.58333
## s (cell 1): 1.32014
## nu (cell 1): 1.02977
## theta (batch 1): 0.0858284
## betas:    0.4762  -0.1722   0.5326  -0.5621   0.7595   1.4067   1.5550   0.7029   1.8990   0.4018
##
## sigma: 0.266955
## lambda (gene 1): 0.738161
## epsilon (gene 1): 0.460999
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 17600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 489.18
## delta (gene 1): 10.6738
## s (cell 1): 1.19365
## nu (cell 1): 1.10486
## theta (batch 1): 0.0337386
## betas:    1.3631  -0.1468  -0.3598  -0.3395   0.3794   0.9182   1.3944   0.5808   1.0030   0.8231
##
## sigma: 0.269337
## lambda (gene 1): 0.517999
## epsilon (gene 1): 0.539995
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## ---------------------------------------------------------
## Iteration 17640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 296.139
## delta (gene 1): 11.6781
## s (cell 1): 0.969174
## nu (cell 1): 1.05332
## theta (batch 1): 0.0547855
## betas:    1.0697  -0.1696  -0.7711  -0.2113  -0.0659   1.6850   0.8771   0.8902   1.5552   0.1684
##
## sigma: 0.269107
## lambda (gene 1): 0.649115
## epsilon (gene 1): 0.658109
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## -------------------------------------------------------
## Iteration 17680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 500.676
## delta (gene 1): 11.6244
## s (cell 1): 1.09306
## nu (cell 1): 1.0864
## theta (batch 1): 0.00681421
## betas:    1.3742  -0.2378  -0.3853  -0.6779  -0.4116   1.8220   0.6435   1.1761   1.0168   0.9404  -(
##
## sigma: 0.252564
## lambda (gene 1): 0.75045
## epsilon (gene 1): 0.202448
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.1
## -------------------------------------------------------
## Iteration 17720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 495.943
## delta (gene 1): 15.9071
## s (cell 1): 1.13543
## nu (cell 1): 1.06666
## theta (batch 1): 0.00987219
## betas:    1.5459  -0.2148  -1.0121  -1.0069   0.4759   0.6475   1.3095   0.7574   0.9967   0.9073  -(
##
## sigma: 0.260669
## lambda (gene 1): 1.18432
## epsilon (gene 1): 0.644967
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1
## -------------------------------------------------------
## Iteration 17760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.351
## delta (gene 1): 8.77885
## s (cell 1): 1.21408
## nu (cell 1): 1.00207
## theta (batch 1): 0.0270097
```

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## betas:     1.3878  -0.1553  -0.6084  -0.8476   0.6346   0.8892   1.0134   0.9075   0.9822   0.7068  -(
##
## sigma: 0.257939
## lambda (gene 1): 2.1066
## epsilon (gene 1): 0.173679
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.1
## -------------------------------------------------------
## Iteration 17800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 560.314
## delta (gene 1): 9.05932
## s (cell 1): 1.04267
## nu (cell 1): 0.983484
## theta (batch 1): 0.0152052
## betas:     0.7720  -0.1871  -0.1979  -0.4856   0.6035   1.0818   1.7505   0.4755   1.6167   0.9965  -(
##
## sigma: 0.282522
## lambda (gene 1): 0.558605
## epsilon (gene 1): 0.325586
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## -------------------------------------------------------
## Iteration 17840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 774.653
## delta (gene 1): 6.23194
## s (cell 1): 1.09116
## nu (cell 1): 0.975976
## theta (batch 1): 0.0357449
## betas:     0.9111  -0.1090   0.4521  -0.2953   0.3197   1.2824   1.1940   0.9840   0.9670   0.8360  -(
##
## sigma: 0.263855
## lambda (gene 1): 2.72601
## epsilon (gene 1): -0.0300092
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## -------------------------------------------------------
## Iteration 17880 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 660.491
## delta (gene 1): 7.96526
## s (cell 1): 1.15954
## nu (cell 1): 1.04205
## theta (batch 1): 0.0112752
## betas:    1.4356  -0.2382  -1.2323  -0.2886   0.1601   0.9035   1.4699   0.5382   1.3739   0.7373  -(
##
## sigma: 0.261179
## lambda (gene 1): 1.39205
## epsilon (gene 1): 0.32243
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## --------------------------------------------------------
## Iteration 17920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 644.688
## delta (gene 1): 9.21907
## s (cell 1): 0.963265
## nu (cell 1): 1.05578
## theta (batch 1): 0.022254
## betas:    1.5133  -0.1078   0.7412  -1.2398   0.5111   1.3357   0.7887   0.8038   0.7616   0.7425  -(
##
## sigma: 0.259836
## lambda (gene 1): 1.03036
## epsilon (gene 1): -0.018095
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 17960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 620.63
## delta (gene 1): 10.478
## s (cell 1): 1.28646
## nu (cell 1): 1.01101
## theta (batch 1): 0.0242898
## betas:    1.7999  -0.2826  -0.8494  -0.3513  -0.2904   0.5930   1.2575   0.7732   0.9372   0.9760  -(
##
## sigma: 0.25278
## lambda (gene 1): 1.06969
## epsilon (gene 1): 0.596191
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
```

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## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 18000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 956.679
## delta (gene 1): 11.8369
## s (cell 1): 1.11313
## nu (cell 1): 1.04536
## theta (batch 1): 0.0144564
## betas:    1.2336  -0.1152  -0.1561   0.4283  -0.2158   0.9294   1.6057   0.5151   0.8638   1.0418  -(
##
## sigma: 0.285305
## lambda (gene 1): 2.31869
## epsilon (gene 1): 0.789345
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 18040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 777.595
## delta (gene 1): 11.3959
## s (cell 1): 0.995357
## nu (cell 1): 1.06742
## theta (batch 1): 0.00268006
## betas:    0.7533  -0.1116   0.3798  -0.0347   0.5264   0.6520   1.9495   0.5391   1.3485   0.8075  -(
##
## sigma: 0.261814
## lambda (gene 1): 0.591735
## epsilon (gene 1): 0.791976
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 18080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 338.862
## delta (gene 1): 10.5334
## s (cell 1): 1.1343
## nu (cell 1): 1.0922
## theta (batch 1): 0.00342534
## betas:    1.0681  -0.2527  -0.5833  -0.5009   0.3441   1.5710   1.1285   0.8082   1.6829   0.4717   (
##
```

```
## sigma: 0.244335
## lambda (gene 1): 0.354554
## epsilon (gene 1): 0.43102
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 18120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 587.315
## delta (gene 1): 10.5688
## s (cell 1): 1.03736
## nu (cell 1): 1.03995
## theta (batch 1): 0.00267481
## betas:    1.3060  -0.1855  -0.5716   0.1499   0.2989   1.0682   1.2335   0.5679   1.4757   0.4927  -(
##
## sigma: 0.25316
## lambda (gene 1): 2.78757
## epsilon (gene 1): 0.138385
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 18160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 565.099
## delta (gene 1): 10.2548
## s (cell 1): 0.934613
## nu (cell 1): 1.03168
## theta (batch 1): 0.0102324
## betas:    1.4419  -0.2491  -0.9467  -0.5542   0.2339   1.1268   1.1534   0.7104   1.2592   0.9353  -(
##
## sigma: 0.256026
## lambda (gene 1): 1.11357
## epsilon (gene 1): 0.341501
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 18200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 424.168
```

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## delta (gene 1): 8.89479
## s (cell 1): 1.24276
## nu (cell 1): 1.13627
## theta (batch 1): 0.00435354
## betas:    0.7578  -0.0733   0.3519   0.3350   0.2498   0.6714   1.9474   0.5366   1.0009   1.2713  -
##
## sigma: 0.273834
## lambda (gene 1): 1.81256
## epsilon (gene 1): 0.0612547
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 18240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 463.734
## delta (gene 1): 8.4284
## s (cell 1): 0.952011
## nu (cell 1): 1.07262
## theta (batch 1): 0.0056588
## betas:    1.2130  -0.0998  -0.1600   0.1762  -0.7514   1.8627   0.8955   0.9078   0.9052   0.6764  -
##
## sigma: 0.259463
## lambda (gene 1): 1.62013
## epsilon (gene 1): 0.0453393
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 18280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 457.365
## delta (gene 1): 12.1138
## s (cell 1): 1.1381
## nu (cell 1): 1.05181
## theta (batch 1): 0.00192697
## betas:    0.8861  -0.0907   0.2046  -0.1587   0.8463   1.2140   1.2483   0.7910   1.2991   0.2153
##
## sigma: 0.262743
## lambda (gene 1): 0.930846
## epsilon (gene 1): 0.506769
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
```

```
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 18320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 657.241
## delta (gene 1): 8.3355
## s (cell 1): 1.00174
## nu (cell 1): 1.13136
## theta (batch 1): 0.00523934
## betas:    1.5969  -0.2192  -0.1179  -0.6928   0.2429   0.8384   1.1457   0.8220   0.9947   0.7654  -0
##
## sigma: 0.270019
## lambda (gene 1): 2.00766
## epsilon (gene 1): 0.0356671
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 18360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 600.278
## delta (gene 1): 11.4261
## s (cell 1): 1.14304
## nu (cell 1): 1.0554
## theta (batch 1): 0.00730898
## betas:    0.7824  -0.1340   0.2340  -0.2310  -0.0387   1.4998   1.1736   1.0251   1.1264   1.0714  -0
##
## sigma: 0.261331
## lambda (gene 1): 1.11844
## epsilon (gene 1): 0.647807
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## ---------------------------------------------------------
## Iteration 18400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 477.864
## delta (gene 1): 9.73707
## s (cell 1): 1.10765
## nu (cell 1): 1.0484
## theta (batch 1): 0.00227676
## betas:    0.8485  -0.1456  -0.5976  -0.5106   0.6866   1.3904   0.9295   1.3388   0.8127   1.1872  -0
##
## sigma: 0.279607
## lambda (gene 1): 1.3759
```

```
## epsilon (gene 1): -0.0351359
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 18440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 937.486
## delta (gene 1): 17.3587
## s (cell 1): 1.05526
## nu (cell 1): 0.990857
## theta (batch 1): 0.00503305
## betas:    1.7949  -0.1697  -0.3027  -0.3752  -0.3971   1.5029   0.4373   1.0489   0.7653   0.4797  -(
##
## sigma: 0.260598
## lambda (gene 1): 0.444491
## epsilon (gene 1): 0.58336
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 18480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 504.956
## delta (gene 1): 10.5893
## s (cell 1): 0.862008
## nu (cell 1): 1.00881
## theta (batch 1): 0.00856469
## betas:    0.8921  -0.0958   0.2453  -0.3399   0.5408   1.5486   1.1408   0.7486   1.2798   0.4977  -(
##
## sigma: 0.252921
## lambda (gene 1): 0.960831
## epsilon (gene 1): 0.810337
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.3
## -------------------------------------------------------
## Iteration 18520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.673
## delta (gene 1): 11.4421
## s (cell 1): 0.862024
```

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## nu (cell 1): 1.05682
## theta (batch 1): 0.0350535
## betas:    1.2462  -0.2753   0.1574  -0.5862   0.2028   1.1381   1.1550   1.0675   1.1407   1.0807  -(
##
## sigma: 0.253819
## lambda (gene 1): 0.839988
## epsilon (gene 1): 0.696564
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.2
## ----------------------------------------------------------
## Iteration 18560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 757.453
## delta (gene 1): 8.06326
## s (cell 1): 0.82524
## nu (cell 1): 1.01577
## theta (batch 1): 0.0868162
## betas:    1.1140  -0.1850   0.3919   0.3461  -0.6650   1.7652   1.1327   0.6108   1.5231   0.6975  -(
##
## sigma: 0.265501
## lambda (gene 1): 1.38011
## epsilon (gene 1): 0.0445673
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ----------------------------------------------------------
## Iteration 18600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 620.528
## delta (gene 1): 10.162
## s (cell 1): 0.927315
## nu (cell 1): 1.01161
## theta (batch 1): 0.0653344
## betas:    1.8810  -0.2408  -0.5961  -0.6354   0.3262   0.5710   0.9976   0.9912   0.5092   1.1672  -(
##
## sigma: 0.27955
## lambda (gene 1): 3.03197
## epsilon (gene 1): 0.494904
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ----------------------------------------------------------
```

```
## Iteration 18640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 355.29
## delta (gene 1): 10.188
## s (cell 1): 1.18818
## nu (cell 1): 1.08437
## theta (batch 1): 0.0120034
## betas:    1.0968  -0.2215  -0.1056  -0.3068   0.4322   0.8639   1.7415   0.3460   1.7645   0.6443  -(
##
## sigma: 0.246868
## lambda (gene 1): 1.01876
## epsilon (gene 1): 0.563011
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## --------------------------------------------------------
## Iteration 18680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 859.086
## delta (gene 1): 12.3552
## s (cell 1): 1.48136
## nu (cell 1): 1.06463
## theta (batch 1): 0.0343334
## betas:    1.8532  -0.3170  -0.6086  -0.9066   0.0925   0.5744   1.0712   0.8891   1.0209   0.9888  -(
##
## sigma: 0.252099
## lambda (gene 1): 0.561146
## epsilon (gene 1): 0.751395
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## --------------------------------------------------------
## Iteration 18720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 366.93
## delta (gene 1): 9.24234
## s (cell 1): 1.04251
## nu (cell 1): 1.05161
## theta (batch 1): 0.00333699
## betas:    1.0427  -0.2118  -0.1091   0.1261  -0.0560   1.3302   1.3634   0.7371   1.3695   0.9393  -(
##
## sigma: 0.28077
## lambda (gene 1): 1.09913
## epsilon (gene 1): 0.373104
## --------------------------------------------------------
```

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## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 18760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 647.288
## delta (gene 1): 13.4015
## s (cell 1): 1.06547
## nu (cell 1): 1.04332
## theta (batch 1): 0.00266478
## betas:    0.9066  -0.2893   0.4832  -1.3368   0.4585   1.1051   1.3601   0.9411   1.6567   0.9778   (
##
## sigma: 0.27985
## lambda (gene 1): 0.541191
## epsilon (gene 1): 0.943785
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 18800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 422.013
## delta (gene 1): 12.1375
## s (cell 1): 1.13829
## nu (cell 1): 1.04209
## theta (batch 1): 0.013162
## betas:    0.9539  -0.1724  -0.5247  -0.2936  -0.3950   1.4588   1.4794   0.6203   1.3217   1.0871  -(
##
## sigma: 0.282805
## lambda (gene 1): 0.459333
## epsilon (gene 1): 0.849297
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 18840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 451.871
## delta (gene 1): 11.4558
## s (cell 1): 1.10863
## nu (cell 1): 1.01984
## theta (batch 1): 0.0185304
```

```
## betas:    0.9260  -0.1158   0.2738   0.0785  -0.2366   0.7623   1.7090   0.7108   1.1029   1.1225  -(
##
## sigma: 0.272252
## lambda (gene 1): 0.834665
## epsilon (gene 1): 0.825675
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 18880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 469.174
## delta (gene 1): 10.5522
## s (cell 1): 0.95784
## nu (cell 1): 0.96994
## theta (batch 1): 0.049217
## betas:    1.1094  -0.1617  -0.6343  -0.2878   0.1449   1.2593   1.5142   0.7032   1.0203   1.1069  -(
##
## sigma: 0.265426
## lambda (gene 1): 0.684307
## epsilon (gene 1): 0.382978
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 18920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 476.77
## delta (gene 1): 8.2199
## s (cell 1): 1.09978
## nu (cell 1): 0.990221
## theta (batch 1): 0.0187338
## betas:    1.2173  -0.1080   0.1154  -0.1728   0.1954   1.0425   1.4995   0.6893   0.7738   1.0500  -(
##
## sigma: 0.25902
## lambda (gene 1): 0.748226
## epsilon (gene 1): 0.168772
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 18960 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 546.573
## delta (gene 1): 10.0802
## s (cell 1): 1.15677
## nu (cell 1): 1.09456
## theta (batch 1): 0.00477098
## betas:    1.0894  -0.1576   0.1840  -0.1860  -0.0889   1.4850   1.1791   0.8745   1.1615   0.7189  -(
##
## sigma: 0.25805
## lambda (gene 1): 0.381862
## epsilon (gene 1): 0.224285
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 19000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 594.398
## delta (gene 1): 10.4484
## s (cell 1): 0.951712
## nu (cell 1): 1.02885
## theta (batch 1): 0.0277509
## betas:    0.9296  -0.2008  -0.3854   0.0735   0.0449   1.3117   1.1671   1.0816   1.1975   1.0412  -(
##
## sigma: 0.267349
## lambda (gene 1): 0.586198
## epsilon (gene 1): 0.555784
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 19040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 408.048
## delta (gene 1): 6.91289
## s (cell 1): 1.09625
## nu (cell 1): 1.09341
## theta (batch 1): 0.024321
## betas:    0.8237  -0.2516   0.4162  -0.7105   0.5449   0.8161   1.5761   1.0242   1.2770   1.3163  -(
##
## sigma: 0.268682
## lambda (gene 1): 0.733618
## epsilon (gene 1): 0.190153
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 19080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 523.894
## delta (gene 1): 12.4377
## s (cell 1): 0.918228
## nu (cell 1): 1.01659
## theta (batch 1): 0.00398007
## betas:    0.9672  -0.1837   0.2813   0.1028   0.2458   1.2636   1.3645   0.6764   1.4757   0.6659  -(
##
## sigma: 0.254951
## lambda (gene 1): 0.44695
## epsilon (gene 1): 0.209269
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 19120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 630.968
## delta (gene 1): 9.46498
## s (cell 1): 1.03737
## nu (cell 1): 1.06717
## theta (batch 1): 0.00482996
## betas:    1.5663  -0.1572   0.3777  -0.8466   0.8511   0.6930   1.0757   0.6653   1.1265   0.4629  -(
##
## sigma: 0.269958
## lambda (gene 1): 0.777819
## epsilon (gene 1): 0.830197
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 19160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.307
## delta (gene 1): 8.62058
## s (cell 1): 1.06132
## nu (cell 1): 1.07146
## theta (batch 1): 0.0338184
## betas:    0.8179  -0.1643  -0.5363   0.4245   0.6131   0.5870   1.5616   0.9644   1.2086   1.0565  -(
##
```

```
## sigma: 0.259275
## lambda (gene 1): 1.00693
## epsilon (gene 1): 0.0632083
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## ------------------------------------------------------------
## Iteration 19200 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 796.555
## delta (gene 1): 10.1165
## s (cell 1): 1.0511
## nu (cell 1): 1.00748
## theta (batch 1): 0.0219687
## betas:    1.3048  -0.1999   0.7868  -0.3100  -0.5586   1.4571   1.1439   0.5371   1.4947   0.5898  -(
##
## sigma: 0.293377
## lambda (gene 1): 0.590275
## epsilon (gene 1): 0.396389
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 19240 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 393.335
## delta (gene 1): 13.6239
## s (cell 1): 1.00032
## nu (cell 1): 1.10048
## theta (batch 1): 0.0221526
## betas:    1.1970  -0.1928  -0.4501  -0.4313   0.0733   0.9974   1.4461   0.6752   1.2717   0.8506  -(
##
## sigma: 0.27301
## lambda (gene 1): 0.493169
## epsilon (gene 1): 0.754971
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 19280 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 387.698
```

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## delta (gene 1): 10.75
## s (cell 1): 0.98543
## nu (cell 1): 1.02311
## theta (batch 1): 0.00303147
## betas:    0.8414  -0.2268  -0.1455  -0.6236   0.4534   1.0942   1.5152   0.9072   1.4300   0.9269  -(
##
## sigma: 0.267638
## lambda (gene 1): 0.549697
## epsilon (gene 1): 0.474572
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## --------------------------------------------------------
## Iteration 19320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.911
## delta (gene 1): 13.2655
## s (cell 1): 1.12641
## nu (cell 1): 1.13917
## theta (batch 1): 0.00488814
## betas:    0.9203  -0.3213  -0.8168   0.1275   0.2349   1.2997   1.0576   1.4327   1.2459   1.0393  (
##
## sigma: 0.267096
## lambda (gene 1): 0.560759
## epsilon (gene 1): 0.85782
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 19360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 518.002
## delta (gene 1): 11.3075
## s (cell 1): 1.05684
## nu (cell 1): 1.08659
## theta (batch 1): 0.0120883
## betas:    1.4020  -0.2576   0.4102  -0.6107   0.4545   0.7764   1.3189   0.8063   1.2578   0.7572  (
##
## sigma: 0.263135
## lambda (gene 1): 0.944265
## epsilon (gene 1): 0.478745
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
```

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## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 19400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 572.597
## delta (gene 1): 10.0247
## s (cell 1): 0.93826
## nu (cell 1): 0.952123
## theta (batch 1): 0.0734203
## betas:    1.3326  -0.1735   0.3205  -0.2889   0.0566   1.1095   1.2699   0.6231   1.1196   0.8892  -(
##
## sigma: 0.274328
## lambda (gene 1): 1.47524
## epsilon (gene 1): 0.40545
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 19440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 620.049
## delta (gene 1): 6.78981
## s (cell 1): 1.21462
## nu (cell 1): 1.04561
## theta (batch 1): 0.0207326
## betas:    1.4491  -0.2865   0.1409  -0.5213  -0.0443   0.7005   1.7116   0.4175   1.5245   0.8308  -(
##
## sigma: 0.267353
## lambda (gene 1): 1.13253
## epsilon (gene 1): 0.0871091
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 19480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 592.585
## delta (gene 1): 10.3113
## s (cell 1): 0.950642
## nu (cell 1): 1.08013
## theta (batch 1): 0.00805436
## betas:    0.4454  -0.2711   0.4574   0.2108   0.0499   1.7057   1.4265   1.0292   1.7050   1.1570   (
##
## sigma: 0.27089
## lambda (gene 1): 0.60457
```

```
## epsilon (gene 1): 0.178418
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 19520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 816.147
## delta (gene 1): 9.17913
## s (cell 1): 1.0717
## nu (cell 1): 1.09747
## theta (batch 1): 0.00293519
## betas:    1.5411  -0.1688  -0.5720  -0.8102   0.6515   0.4867   1.5366   0.3675   1.1822   0.7536  -(
##
## sigma: 0.245524
## lambda (gene 1): 2.98255
## epsilon (gene 1): 0.134778
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 19560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 507.991
## delta (gene 1): 12.4199
## s (cell 1): 1.05339
## nu (cell 1): 1.02563
## theta (batch 1): 0.00103699
## betas:    1.1459  -0.1517  -0.1604  -0.5343   0.1676   1.5538   0.9599   0.9945   0.9482   0.9361  -(
##
## sigma: 0.264791
## lambda (gene 1): 1.4284
## epsilon (gene 1): 0.369103
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 19600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 580.576
## delta (gene 1): 9.69
## s (cell 1): 1.03647
```

```
## nu (cell 1): 1.06917
## theta (batch 1): 0.00424452
## betas:    1.5012  -0.2467  -1.1737  -0.3815  -0.6447   1.2446   1.0214   0.8027   1.0578   1.2165  -(
##
## sigma: 0.277536
## lambda (gene 1): 0.861259
## epsilon (gene 1): 0.0920118
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 19640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 676.945
## delta (gene 1): 9.89258
## s (cell 1): 1.05327
## nu (cell 1): 1.02628
## theta (batch 1): 0.00544652
## betas:    1.3841  -0.2316  -0.7615  -0.1761  -0.1701   0.9024   1.3091   0.9272   0.9318   1.1784  -(
##
## sigma: 0.256502
## lambda (gene 1): 0.797971
## epsilon (gene 1): 0.118328
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 19680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 441.868
## delta (gene 1): 11.9215
## s (cell 1): 1.08205
## nu (cell 1): 1.06847
## theta (batch 1): 0.00108264
## betas:    0.4737  -0.1692   0.4555  -0.1481   0.7674   1.3351   1.5924   0.7725   1.6535   0.8442  -(
##
## sigma: 0.271672
## lambda (gene 1): 1.69348
## epsilon (gene 1): -0.0900201
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.5
## ----------------------------------------------------------
```

```
## Iteration 19720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 617.281
## delta (gene 1): 11.4219
## s (cell 1): 1.01705
## nu (cell 1): 1.05044
## theta (batch 1): 0.000684604
## betas:    1.5793  -0.3674  -1.0930  -0.3597  -0.0267   0.4886   1.6672   0.4901   1.6221   0.8565   (
##
## sigma: 0.274836
## lambda (gene 1): 0.904364
## epsilon (gene 1): 0.851426
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -1.4
## LSnu (cell 1): -5
## LStheta (batch 1): -1.4
## ---------------------------------------------------------
## Iteration 19760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.845
## delta (gene 1): 12.6306
## s (cell 1): 1.21019
## nu (cell 1): 1.16466
## theta (batch 1): 0.000393301
## betas:    1.4347  -0.3258   0.0461  -0.6824   0.0980   1.0096   1.1068   0.9711   1.2825   1.0487   (
##
## sigma: 0.259746
## lambda (gene 1): 1.34297
## epsilon (gene 1): 0.623878
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.3
## ---------------------------------------------------------
## Iteration 19800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 497.307
## delta (gene 1): 10.2063
## s (cell 1): 1.14139
## nu (cell 1): 1.13619
## theta (batch 1): 0.000349137
## betas:    1.5610  -0.1924  -0.0556  -0.1978   0.4141   0.5430   1.0684   1.0561   0.6079   1.1897   -(
##
## sigma: 0.282412
## lambda (gene 1): 1.21513
## epsilon (gene 1): 0.322672
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 19840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 435.654
## delta (gene 1): 9.88353
## s (cell 1): 1.12174
## nu (cell 1): 1.08315
## theta (batch 1): 0.000732764
## betas:    1.6980  -0.3970   0.1414  -0.5992  -0.4235   0.9527   1.0998   0.9236   1.3718   1.1487  -(
##
## sigma: 0.258618
## lambda (gene 1): 1.3692
## epsilon (gene 1): 0.34394
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.4
## -------------------------------------------------------
## Iteration 19880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 511.36
## delta (gene 1): 8.98363
## s (cell 1): 1.11984
## nu (cell 1): 1.10653
## theta (batch 1): 0.000215812
## betas:    1.5797  -0.1784   1.2277  -0.6342  -0.5009   1.1790   1.0880   0.5984   1.2672   0.3256   (
##
## sigma: 0.262241
## lambda (gene 1): 1.95352
## epsilon (gene 1): 0.55435
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## Iteration 19920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 549.054
## delta (gene 1): 10.1682
## s (cell 1): 1.03486
## nu (cell 1): 1.03178
## theta (batch 1): 0.000139373
```

```
## betas:    1.5451  -0.4255  -0.0200  -0.9841   0.1191   1.2569   0.8747   1.3761   1.0426   1.4336   (
##
## sigma: 0.244781
## lambda (gene 1): 1.8583
## epsilon (gene 1): 0.440666
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.4
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 19960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 393.959
## delta (gene 1): 9.2382
## s (cell 1): 1.02454
## nu (cell 1): 1.00004
## theta (batch 1): 0.000128095
## betas:    1.4842  -0.4341   0.0066  -1.0661   0.1163   1.2934   0.8543   1.1794   1.5778   0.9137   (
##
## sigma: 0.265187
## lambda (gene 1): 1.15227
## epsilon (gene 1): 0.309896
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.5
## LStheta (batch 1): -1.5
## -------------------------------------------------------
## End of Burn-in period.
## -------------------------------------------------------
## -------------------------------------------------------
## Iteration 20000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 852.358
## delta (gene 1): 7.86076
## s (cell 1): 0.98997
## nu (cell 1): 0.996256
## theta (batch 1): 0.000137277
## betas:    0.9049  -0.1952  -0.9716   0.1051   0.3318   1.3438   0.8788   1.3726   1.0050   1.1236  -(
##
## sigma: 0.281023
## lambda (gene 1): 0.153703
## epsilon (gene 1): 0.581915
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

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## --------------------------------------------------------
## Iteration 20040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 484.355
## delta (gene 1): 10.0178
## s (cell 1): 1.06494
## nu (cell 1): 1.03413
## theta (batch 1): 0.000406464
## betas:    1.3226  -0.0746  -0.2629  -0.2516  -0.0101   1.2036   1.1957   0.5099   1.0581   0.5537  -(
##
## sigma: 0.259303
## lambda (gene 1): 1.25272
## epsilon (gene 1): 0.829116
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 20080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 611.122
## delta (gene 1): 9.11947
## s (cell 1): 1.12078
## nu (cell 1): 1.06492
## theta (batch 1): 0.000898824
## betas:    0.9303  -0.1562  -0.5090  -0.4742   0.4941   1.7603   0.7714   1.1399   1.0874   1.0060  -(
##
## sigma: 0.257548
## lambda (gene 1): 0.119191
## epsilon (gene 1): 0.747149
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 20120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 326.578
## delta (gene 1): 8.69424
## s (cell 1): 1.02368
## nu (cell 1): 1.03837
## theta (batch 1): 0.00313714
## betas:    1.0576  -0.1093  -0.0546  -0.4092   0.0217   1.4887   1.0632   0.8456   1.1001   0.7175  -(
##
## sigma: 0.249912
## lambda (gene 1): 0.461668
## epsilon (gene 1): 0.750019
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 20160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 639.58
## delta (gene 1): 12.7857
## s (cell 1): 1.10557
## nu (cell 1): 1.00221
## theta (batch 1): 0.00600345
## betas:    0.8159  -0.1467  -0.5668  -0.0708   0.4218   1.2369   1.2960   0.9421   1.3399   0.6156  -
##
## sigma: 0.243962
## lambda (gene 1): 0.624889
## epsilon (gene 1): 1.11612
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 20200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 620.431
## delta (gene 1): 9.86894
## s (cell 1): 1.07633
## nu (cell 1): 1.09815
## theta (batch 1): 0.0100107
## betas:    0.9348  -0.0946  -0.2984  -0.2880   0.5208   1.3588   1.0464   0.8191   1.3257   0.4054  -
##
## sigma: 0.244129
## lambda (gene 1): 0.560704
## epsilon (gene 1): 0.846863
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 20240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 327.312
## delta (gene 1): 10.9862
## s (cell 1): 1.01768
## nu (cell 1): 1.06403
```

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## theta (batch 1): 0.0103261
## betas:    1.1146  -0.2538  -1.3172  -0.0979   0.0110   1.7455   0.5439   1.5722   0.8938   1.2305  -(
##
## sigma: 0.244823
## lambda (gene 1): 0.833779
## epsilon (gene 1): 0.978291
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 20280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 963.996
## delta (gene 1): 9.91522
## s (cell 1): 1.88042
## nu (cell 1): 1.06682
## theta (batch 1): 0.0326098
## betas:    0.7601  -0.1301   0.1001  -0.6655   0.5642   1.4930   1.2827   0.7073   1.5375   0.6251  -(
##
## sigma: 0.259656
## lambda (gene 1): 0.336422
## epsilon (gene 1): 0.843842
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 20320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 664.615
## delta (gene 1): 8.07051
## s (cell 1): 0.897036
## nu (cell 1): 1.05752
## theta (batch 1): 0.0136936
## betas:    1.0024  -0.0486   0.0724   0.2926   0.2902   1.1619   1.3863   0.6107   1.0800   0.5727  -(
##
## sigma: 0.261978
## lambda (gene 1): 0.688314
## epsilon (gene 1): 0.65723
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 20360 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 497.852
## delta (gene 1): 10.528
## s (cell 1): 0.916081
## nu (cell 1): 1.05575
## theta (batch 1): 0.0122465
## betas:    1.1017  -0.1220   0.4429  -0.3958   0.5791   1.3323   0.9232   0.9137   1.1767   0.5947  -(
##
## sigma: 0.247666
## lambda (gene 1): 0.124001
## epsilon (gene 1): 0.927546
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 20400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.109
## delta (gene 1): 8.06816
## s (cell 1): 1.23978
## nu (cell 1): 1.10669
## theta (batch 1): 0.0308275
## betas:    1.3371  -0.1740   0.2681  -0.6448   0.4332   0.8221   1.4632   0.4990   1.4291   0.3395  -(
##
## sigma: 0.24185
## lambda (gene 1): 2.35261
## epsilon (gene 1): 0.642748
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 20440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.047
## delta (gene 1): 12.1022
## s (cell 1): 0.811475
## nu (cell 1): 1.04841
## theta (batch 1): 0.0546822
## betas:    1.3093  -0.3195  -0.0908  -0.7147   0.4601   0.5183   1.7929   0.4829   1.6751   0.9442  -(
##
## sigma: 0.250603
## lambda (gene 1): 0.478121
## epsilon (gene 1): 1.02351
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 20480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 612.788
## delta (gene 1): 11.2291
## s (cell 1): 0.789609
## nu (cell 1): 1.09432
## theta (batch 1): 0.0549013
## betas:    1.0660  -0.2066   0.1277  -0.3020  -0.0325   1.0933   1.6428   0.6429   1.3543   0.9242  -0
##
## sigma: 0.242241
## lambda (gene 1): 1.15574
## epsilon (gene 1): 0.980108
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 20520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 570.08
## delta (gene 1): 8.8466
## s (cell 1): 0.809921
## nu (cell 1): 1.00528
## theta (batch 1): 0.0482583
## betas:    1.1360  -0.1082  -0.2548  -0.2568  -0.0199   1.7632   0.8688   0.8955   0.9477   0.9554  -
##
## sigma: 0.245046
## lambda (gene 1): 0.572063
## epsilon (gene 1): 0.772474
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 20560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 387.926
## delta (gene 1): 9.56669
## s (cell 1): 1.0809
## nu (cell 1): 1.04659
## theta (batch 1): 0.00378089
## betas:    0.8111  -0.1774  -0.0462  -0.6968   0.4653   1.6333   1.1966   0.7572   1.6949   0.4554  -0
```

```
## 
## sigma: 0.252375
## lambda (gene 1): 0.282117
## epsilon (gene 1): 0.819505
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 20600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 642.605
## delta (gene 1): 11.5126
## s (cell 1): 1.04722
## nu (cell 1): 1.08826
## theta (batch 1): 0.00752999
## betas:     0.5857  -0.1683   0.0070  -0.5218   0.5805   1.5398   1.1984   1.0838   1.3858   1.0058  -
## 
## sigma: 0.248211
## lambda (gene 1): 0.981371
## epsilon (gene 1): 1.00743
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 20640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 302.829
## delta (gene 1): 10.0729
## s (cell 1): 1.0107
## nu (cell 1): 1.04364
## theta (batch 1): 0.017924
## betas:     1.3359  -0.1453  -0.7484  -0.2089   0.3178   1.0484   1.0289   0.8460   1.1193   0.4144  -
## 
## sigma: 0.253769
## lambda (gene 1): 0.70394
## epsilon (gene 1): 0.84006
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 20680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 511.498
## delta (gene 1): 7.23151
## s (cell 1): 1.03306
## nu (cell 1): 1.0598
## theta (batch 1): 0.0191418
## betas:    1.1915  -0.1077  -0.7790   1.1965  -0.0588   0.6354   1.7466   0.4268   1.1450   0.7129  -(
##
## sigma: 0.256366
## lambda (gene 1): 2.03751
## epsilon (gene 1): 0.568531
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 20720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 343.186
## delta (gene 1): 7.71941
## s (cell 1): 1.06812
## nu (cell 1): 1.10967
## theta (batch 1): 0.0107647
## betas:    1.6353  -0.2324  -0.6017  -0.7234   0.2164   1.5377   0.2938   1.2909   0.9079   0.8100  -(
##
## sigma: 0.244713
## lambda (gene 1): 0.858049
## epsilon (gene 1): 0.589862
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 20760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 458.552
## delta (gene 1): 10.4408
## s (cell 1): 1.30568
## nu (cell 1): 1.05684
## theta (batch 1): 0.0171719
## betas:    1.1831  -0.3620   0.2636  -0.4442  -0.7468   1.9973   0.9996   0.7864   2.0865   0.4669   (
##
## sigma: 0.250345
## lambda (gene 1): 0.108539
## epsilon (gene 1): 0.914061
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 20800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.936
## delta (gene 1): 13.7134
## s (cell 1): 1.0955
## nu (cell 1): 1.04702
## theta (batch 1): 0.00909705
## betas:     1.3898   -0.1973    0.1925   -0.5231    0.1605    1.1054    1.0291    1.0587    0.8453    0.8647   -(
##
## sigma: 0.253887
## lambda (gene 1): 0.323377
## epsilon (gene 1): 1.14623
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 20840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 467.963
## delta (gene 1): 8.53479
## s (cell 1): 1.14608
## nu (cell 1): 1.02995
## theta (batch 1): 0.00569991
## betas:     1.4340   -0.2694    0.4785   -0.9021   -0.3137    1.7966    0.5381    1.3250    0.9730    0.8926   -(
##
## sigma: 0.252084
## lambda (gene 1): 1.39084
## epsilon (gene 1): 0.639001
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 20880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 829.078
## delta (gene 1): 9.03605
## s (cell 1): 0.864029
## nu (cell 1): 0.995635
## theta (batch 1): 0.00944446
## betas:     1.4655   -0.2035   -0.3670   -0.1000    0.2274    0.6019    1.4849    0.6961    0.9373    1.0771   -(
##
## sigma: 0.267178
```

```
## lambda (gene 1): 1.11931
## epsilon (gene 1): 0.755681
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 20920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 475.093
## delta (gene 1): 9.94108
## s (cell 1): 1.33433
## nu (cell 1): 1.07339
## theta (batch 1): 0.0313466
## betas:    1.3820  -0.1763   0.8835  -0.9590   0.1909   1.2614   1.0838   0.5724   1.5489   0.2699  -(
##
## sigma: 0.259651
## lambda (gene 1): 0.651264
## epsilon (gene 1): 0.887407
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 20960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 708.318
## delta (gene 1): 9.76616
## s (cell 1): 0.831089
## nu (cell 1): 0.985505
## theta (batch 1): 0.0124684
## betas:    1.0890  -0.1668  -0.0986  -0.6926  -0.1392   1.3630   1.4397   0.6295   1.2664   0.8397  -(
##
## sigma: 0.25051
## lambda (gene 1): 0.411876
## epsilon (gene 1): 0.828569
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 21000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.24
## delta (gene 1): 10.1874
```

```
## s (cell 1): 0.880782
## nu (cell 1): 1.06009
## theta (batch 1): 0.0814923
## betas:    0.9512  -0.2187   0.0449  -0.7057   0.6260   1.0003   1.4845   0.9538   1.2579   0.8921  -(
##
## sigma: 0.254688
## lambda (gene 1): 0.231887
## epsilon (gene 1): 0.869938
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 21040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 474.986
## delta (gene 1): 8.95194
## s (cell 1): 1.0173
## nu (cell 1): 1.11681
## theta (batch 1): 0.0457275
## betas:    0.0771  -0.2294  -0.2604  -0.3390   0.5257   1.6573   1.2772   1.6536   1.4014   1.1564   (
##
## sigma: 0.253632
## lambda (gene 1): 0.666495
## epsilon (gene 1): 0.728493
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 21080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 489.317
## delta (gene 1): 9.29273
## s (cell 1): 0.816971
## nu (cell 1): 1.12713
## theta (batch 1): 0.0446384
## betas:    0.6481  -0.1082  -0.6169  -0.0754   0.6686   1.2124   1.4155   0.8810   1.2397   0.9020  -(
##
## sigma: 0.243067
## lambda (gene 1): 0.92317
## epsilon (gene 1): 0.794228
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ------------------------------------------------------
## Iteration 21120 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 782.406
## delta (gene 1): 14.2096
## s (cell 1): 1.21981
## nu (cell 1): 1.04615
## theta (batch 1): 0.0435381
## betas:    0.7994  -0.1391   0.7898  -1.2469   0.2265   2.1539   0.7782   1.2652   0.8719   1.1850  -(
##
## sigma: 0.256009
## lambda (gene 1): 0.229177
## epsilon (gene 1): 1.18029
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 21160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 427.962
## delta (gene 1): 9.54856
## s (cell 1): 0.466265
## nu (cell 1): 1.0303
## theta (batch 1): 0.101694
## betas:    0.9274  -0.2586  -0.2807  -0.5444  -0.1922   1.8627   1.1673   0.7550   1.8777   0.5333   (
##
## sigma: 0.250882
## lambda (gene 1): 0.327879
## epsilon (gene 1): 0.811926
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 21200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 626.796
## delta (gene 1): 13.655
## s (cell 1): 0.841781
## nu (cell 1): 1.12911
## theta (batch 1): 0.0222487
## betas:    1.3280  -0.2872  -0.9413  -0.2564  -0.1033   0.9012   1.6022   0.5065   1.6265   0.7537   (
##
## sigma: 0.243717
## lambda (gene 1): 0.837149
## epsilon (gene 1): 1.15171
```

```
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 21240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.787
## delta (gene 1): 11.6448
## s (cell 1): 1.75758
## nu (cell 1): 1.09268
## theta (batch 1): 0.0692392
## betas:    0.4237  -0.2102  -0.3551  -0.7803   0.5540   1.7222   1.2400   1.1084   1.7183   0.7349   (
##
## sigma: 0.24573
## lambda (gene 1): 0.439329
## epsilon (gene 1): 0.999744
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 21280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.762
## delta (gene 1): 11.7166
## s (cell 1): 1.06296
## nu (cell 1): 1.0101
## theta (batch 1): 0.0445537
## betas:    0.9149  -0.2442  -0.9261  -0.8843   0.9369   1.3426   0.8363   1.4213   1.1890   0.9324   (
##
## sigma: 0.252848
## lambda (gene 1): 0.529279
## epsilon (gene 1): 1.00112
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 21320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 308.527
## delta (gene 1): 8.61658
## s (cell 1): 1.11932
## nu (cell 1): 1.01698
```

```
## theta (batch 1): 0.0121936
## betas:    1.0582  -0.1542  -0.5075  -0.0023   0.7419   0.9035   1.2744   1.0017   0.9740   0.9159  -
##
## sigma: 0.253264
## lambda (gene 1): 1.10459
## epsilon (gene 1): 0.713237
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 21360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 576.821
## delta (gene 1): 14.1582
## s (cell 1): 1.1095
## nu (cell 1): 1.05153
## theta (batch 1): 0.010959
## betas:    1.3419  -0.2540  -0.8978  -0.1965  -0.0671   1.3369   1.1660   0.8208   1.2097   1.1180  -
##
## sigma: 0.250722
## lambda (gene 1): 0.331909
## epsilon (gene 1): 1.19007
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 21400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 616.852
## delta (gene 1): 10.2392
## s (cell 1): 1.26608
## nu (cell 1): 1.08767
## theta (batch 1): 0.0473895
## betas:    1.6652  -0.1824  -0.0460  -0.9923  -0.0470   1.4684   0.8889   0.5043   1.4439   0.0442
##
## sigma: 0.256423
## lambda (gene 1): 0.895341
## epsilon (gene 1): 0.860011
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 21440 out of 40000 has been completed.
```

```
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 498.619
## delta (gene 1): 10.1062
## s (cell 1): 0.942778
## nu (cell 1): 0.988522
## theta (batch 1): 0.0183197
## betas:    0.9183  -0.1495  -0.6565  -0.3435   0.6502   1.1535   1.5472   0.4176   1.7851   0.3510  -(
##
## sigma: 0.268236
## lambda (gene 1): 1.54683
## epsilon (gene 1): 0.875509
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 21480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.34
## delta (gene 1): 8.389
## s (cell 1): 1.06329
## nu (cell 1): 1.07479
## theta (batch 1): 0.0089922
## betas:    1.1708  -0.1318  -0.7136  -0.4598   0.4148   1.0102   1.5870   0.2650   1.5377   0.5596  -(
##
## sigma: 0.243595
## lambda (gene 1): 0.408849
## epsilon (gene 1): 0.744475
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 21520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 470.375
## delta (gene 1): 7.27845
## s (cell 1): 1.1189
## nu (cell 1): 1.07924
## theta (batch 1): 0.0450296
## betas:    0.6080  -0.0678  -0.0597  -0.1041   0.3323   1.6532   1.0790   1.1677   0.8411   1.1435  -(
##
## sigma: 0.253965
## lambda (gene 1): 1.86701
## epsilon (gene 1): 0.538127
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 21560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 608.88
## delta (gene 1): 11.4995
## s (cell 1): 0.989544
## nu (cell 1): 1.11247
## theta (batch 1): 0.0268493
## betas:    0.9873  -0.2730  -0.8591  -0.4312   0.5293   1.0595   1.4398   0.7148   1.9460   0.4612   (
##
## sigma: 0.252083
## lambda (gene 1): 0.285472
## epsilon (gene 1): 1.02854
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 21600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.185
## delta (gene 1): 13.8796
## s (cell 1): 1.02124
## nu (cell 1): 1.07932
## theta (batch 1): 0.0589848
## betas:    0.8815  -0.2830  -0.6703  -0.2533   0.2940   1.2977   1.4133   0.8334   1.8224   0.6497   (
##
## sigma: 0.252374
## lambda (gene 1): 0.578738
## epsilon (gene 1): 1.18398
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 21640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 640.569
## delta (gene 1): 7.19254
## s (cell 1): 1.00758
## nu (cell 1): 1.12033
## theta (batch 1): 0.0166297
## betas:    1.5914  -0.1932   0.2688  -1.0578   0.1498   1.1020   1.0986   0.5267   1.4083   0.2996   -(
```

```
##
## sigma: 0.260565
## lambda (gene 1): 0.62703
## epsilon (gene 1): 0.543424
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 21680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 532.221
## delta (gene 1): 9.75575
## s (cell 1): 0.936613
## nu (cell 1): 1.02031
## theta (batch 1): 0.0263546
## betas:    0.3592  -0.1275   0.3005   0.5169   0.0030   1.6370   1.5514   0.8762   1.5539   0.7174
##
## sigma: 0.25267
## lambda (gene 1): 1.36936
## epsilon (gene 1): 0.794489
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 21720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 436.723
## delta (gene 1): 7.24596
## s (cell 1): 1.02894
## nu (cell 1): 1.01702
## theta (batch 1): 0.0275328
## betas:    1.3646  -0.2980  -0.7059  -0.4531  -0.3176   1.6218   0.9278   0.8505   1.5819   0.7044  -0
##
## sigma: 0.252365
## lambda (gene 1): 0.579503
## epsilon (gene 1): 0.518205
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 21760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 403.376
## delta (gene 1): 8.5209
## s (cell 1): 1.00103
## nu (cell 1): 0.992107
## theta (batch 1): 0.0263509
## betas:    0.4743  -0.1707  -0.0709  -0.1905   0.5264   1.4474   1.4596   1.0440   1.4588   0.7632   (
##
## sigma: 0.257383
## lambda (gene 1): 0.729511
## epsilon (gene 1): 0.632888
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 21800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 537.729
## delta (gene 1): 12.1141
## s (cell 1): 0.95561
## nu (cell 1): 1.09399
## theta (batch 1): 0.0211795
## betas:    0.2965  -0.0807   0.0958   0.1990   0.5567   1.4530   1.6143   0.7538   1.6318   0.5696   -(
##
## sigma: 0.258795
## lambda (gene 1): 0.365961
## epsilon (gene 1): 1.04187
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 21840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 743.112
## delta (gene 1): 13.0608
## s (cell 1): 1.10543
## nu (cell 1): 1.13019
## theta (batch 1): 0.0118884
## betas:    1.0302  -0.1191  -0.5272  -0.5347   0.6371   1.3417   0.9204   1.1679   0.8645   0.8018   -(
##
## sigma: 0.240046
## lambda (gene 1): 0.346339
## epsilon (gene 1): 1.09647
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 21880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 683.014
## delta (gene 1): 10.6861
## s (cell 1): 1.13021
## nu (cell 1): 1.06422
## theta (batch 1): 0.00814425
## betas:    0.6189  -0.2202  -0.9527  -0.0348   0.3646   1.6544   0.8768   1.6023   1.1598   0.8903
##
## sigma: 0.256984
## lambda (gene 1): 0.48192
## epsilon (gene 1): 0.861983
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 21920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 598.676
## delta (gene 1): 10.6424
## s (cell 1): 0.995935
## nu (cell 1): 1.12168
## theta (batch 1): 0.00753527
## betas:    0.8721  -0.1889  -0.0855  -0.2375  -0.2455   2.1018   0.8259   1.2479   1.1131   0.9515  -0
##
## sigma: 0.250317
## lambda (gene 1): 0.406921
## epsilon (gene 1): 0.91728
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 21960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 571.31
## delta (gene 1): 9.49926
## s (cell 1): 0.983622
## nu (cell 1): 1.00307
## theta (batch 1): 0.00129356
## betas:    1.3136  -0.2363  -0.0297  -0.4920   0.1350   1.0078   1.4395   0.6823   1.0952   1.2779  -0
##
## sigma: 0.250107
```

```
## lambda (gene 1): 0.225247
## epsilon (gene 1): 0.814693
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 22000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 287.255
## delta (gene 1): 13.4789
## s (cell 1): 0.995887
## nu (cell 1): 1.00053
## theta (batch 1): 0.00035581
## betas:    1.3746  -0.1690  -0.4402   0.3436  -0.1585   1.3357   0.9315   0.8707   1.1783   0.4487  -(
##
## sigma: 0.252771
## lambda (gene 1): 0.173154
## epsilon (gene 1): 1.16664
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 22040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 556.175
## delta (gene 1): 8.99367
## s (cell 1): 1.11444
## nu (cell 1): 1.08568
## theta (batch 1): 0.000513413
## betas:    1.2299  -0.2061   0.2866  -0.8585   0.2976   1.3328   1.1110   0.7985   1.3008   0.7910  -(
##
## sigma: 0.25895
## lambda (gene 1): 1.12745
## epsilon (gene 1): 0.747599
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 22080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 504.286
## delta (gene 1): 11.9115
```

```
## s (cell 1): 1.01742
## nu (cell 1): 1.0742
## theta (batch 1): 0.00414616
## betas:    1.1524  -0.1340  -0.0716  -0.0869   0.1667   1.5234   0.9870   0.7715   1.3135   0.3724  -(
##
## sigma: 0.242374
## lambda (gene 1): 0.276873
## epsilon (gene 1): 1.01525
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 595.102
## delta (gene 1): 8.01063
## s (cell 1): 0.975171
## nu (cell 1): 1.02212
## theta (batch 1): 0.00406878
## betas:    1.8299  -0.2050  -0.6912  -0.1943  -0.4006   1.2587   0.9963   0.5077   1.1025   0.6606  -(
##
## sigma: 0.243651
## lambda (gene 1): 1.6919
## epsilon (gene 1): 0.633707
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 316.089
## delta (gene 1): 6.65033
## s (cell 1): 1.13685
## nu (cell 1): 1.04111
## theta (batch 1): 0.00755387
## betas:    0.9951  -0.1760  -0.2313  -0.2067   0.2030   1.6096   0.4169   1.8837   0.2932   1.5834  -(
##
## sigma: 0.25525
## lambda (gene 1): 0.905218
## epsilon (gene 1): 0.437591
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ----------------------------------------------------------
## Iteration 22200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 504.331
## delta (gene 1): 10.2218
## s (cell 1): 1.24411
## nu (cell 1): 0.988858
## theta (batch 1): 0.00518693
## betas:    0.8772  -0.1250  -1.5436   0.7719   0.5663   0.5374   2.1489   0.1057   1.7848   0.4274  -(
##
## sigma: 0.254853
## lambda (gene 1): 0.707507
## epsilon (gene 1): 0.894894
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 746.255
## delta (gene 1): 9.06115
## s (cell 1): 0.972894
## nu (cell 1): 1.05093
## theta (batch 1): 0.00437256
## betas:    1.4402  -0.1775  -0.2943  -0.7128  -0.0142   1.6166   0.8166   0.8505   1.1569   0.4232  -(
##
## sigma: 0.24671
## lambda (gene 1): 0.572668
## epsilon (gene 1): 0.726659
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 548.285
## delta (gene 1): 8.34736
## s (cell 1): 1.25924
## nu (cell 1): 1.04044
## theta (batch 1): 0.0363563
## betas:    0.5018  -0.0405   0.2631  -0.0661   0.3445   1.8985   0.9004   1.1802   1.1237   0.6395  -(
##
## sigma: 0.237261
## lambda (gene 1): 0.511248
## epsilon (gene 1): 0.673794
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 707.111
## delta (gene 1): 10.8902
## s (cell 1): 1.0029
## nu (cell 1): 1.04719
## theta (batch 1): 0.0124951
## betas:    1.1470  -0.0380   0.0861  -0.2729   0.0956   1.4893   1.1072   0.4007   1.4313   0.0756  -(
##
## sigma: 0.265161
## lambda (gene 1): 0.435271
## epsilon (gene 1): 0.968027
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.909
## delta (gene 1): 16.3946
## s (cell 1): 1.80095
## nu (cell 1): 1.06013
## theta (batch 1): 0.0536216
## betas:    0.6355  -0.1541  -0.7175  -0.4248   0.7750   1.4885   1.0955   1.1023   1.4297   0.6175  -(
##
## sigma: 0.244528
## lambda (gene 1): 0.370349
## epsilon (gene 1): 1.34658
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 659.266
## delta (gene 1): 11.2218
## s (cell 1): 1.0004
## nu (cell 1): 1.05801
```

```
## theta (batch 1): 0.098645
## betas:     0.8445  -0.2574   0.0661  -1.2383   0.5295   1.2019   1.6678   0.5494   1.9118   0.7594  -(
##
## sigma: 0.258417
## lambda (gene 1): 0.533025
## epsilon (gene 1): 1.0248
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 419.51
## delta (gene 1): 9.78565
## s (cell 1): 1.1236
## nu (cell 1): 1.07608
## theta (batch 1): 0.0414463
## betas:     0.9862  -0.1537   0.4452  -0.9600   0.2353   1.4937   1.1645   0.7432   1.2935   0.8893  -(
##
## sigma: 0.24527
## lambda (gene 1): 0.859349
## epsilon (gene 1): 0.858266
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 504.541
## delta (gene 1): 15.2159
## s (cell 1): 1.74764
## nu (cell 1): 1.0666
## theta (batch 1): 0.0251402
## betas:     1.4527  -0.2169  -0.0427  -0.9262   0.1400   1.1999   1.1882   0.4370   1.5644   0.5596  -(
##
## sigma: 0.251874
## lambda (gene 1): 0.320404
## epsilon (gene 1): 1.27301
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22520 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.564
## delta (gene 1): 15.7189
## s (cell 1): 1.08126
## nu (cell 1): 1.02262
## theta (batch 1): 0.0279584
## betas:    1.3154  -0.2594  -0.3191  -1.1078   0.2541   1.7733   0.4556   1.2454   1.3000   0.6396   (
##
## sigma: 0.258402
## lambda (gene 1): 0.266058
## epsilon (gene 1): 1.32162
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 619.123
## delta (gene 1): 9.82258
## s (cell 1): 1.12245
## nu (cell 1): 1.10216
## theta (batch 1): 0.0410789
## betas:    1.0597  -0.1483  -0.2615  -1.2351   0.8802   1.2248   1.0738   0.9377   1.1458   0.8363   -(
##
## sigma: 0.259061
## lambda (gene 1): 1.64457
## epsilon (gene 1): 0.835101
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 22600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 279.828
## delta (gene 1): 8.80505
## s (cell 1): 1.08809
## nu (cell 1): 1.03421
## theta (batch 1): 0.0140256
## betas:    0.8941  -0.2519  -1.1154  -0.2422   0.4190   1.3141   0.8792   1.5740   0.9968   1.1381   (
##
## sigma: 0.254702
## lambda (gene 1): 1.28704
## epsilon (gene 1): 0.697176
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.623
## delta (gene 1): 7.88111
## s (cell 1): 1.31038
## nu (cell 1): 1.08196
## theta (batch 1): 0.0398736
## betas:    1.0195  -0.1429  -0.2372  -0.7128   0.6092   1.1801   1.3565   0.5345   1.6041   0.2817   (
##
## sigma: 0.2492
## lambda (gene 1): 1.08265
## epsilon (gene 1): 0.619047
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 763.826
## delta (gene 1): 11.3093
## s (cell 1): 1.15048
## nu (cell 1): 1.0686
## theta (batch 1): 0.0342025
## betas:    1.1021  -0.1240  -0.3171  -0.3233   0.2543   1.4111   1.4812   0.3412   1.4715   0.5151   -(
##
## sigma: 0.256945
## lambda (gene 1): 0.894449
## epsilon (gene 1): 0.954062
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 368.955
## delta (gene 1): 9.89742
## s (cell 1): 1.29386
## nu (cell 1): 1.13314
## theta (batch 1): 0.0216778
## betas:    1.0852  -0.1875  -0.9196  -0.0168   0.2245   1.6676   0.5688   1.4867   0.7683   1.1459   -(
```

```
## 
## sigma: 0.249213
## lambda (gene 1): 0.628629
## epsilon (gene 1): 0.84114
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 22760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 548.348
## delta (gene 1): 11.8688
## s (cell 1): 1.12442
## nu (cell 1): 1.05334
## theta (batch 1): 0.0240513
## betas:    0.6756  -0.1061   0.3931  -0.5504   0.6628   1.1411   1.5641   0.6741   1.6133   0.2753   
## 
## sigma: 0.27244
## lambda (gene 1): 1.16255
## epsilon (gene 1): 1.03893
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 22800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.084
## delta (gene 1): 10.7564
## s (cell 1): 1.08435
## nu (cell 1): 1.06316
## theta (batch 1): 0.0129492
## betas:    0.9283  -0.2562  -0.5239   0.1866   0.0096   1.5325   1.2197   0.7769   1.7915   0.7287  -0
## 
## sigma: 0.234989
## lambda (gene 1): 0.165919
## epsilon (gene 1): 0.951084
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 22840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 439.528
## delta (gene 1): 11.5189
## s (cell 1): 1.10432
## nu (cell 1): 1.10479
## theta (batch 1): 0.000668565
## betas:    1.3948  -0.1566  -0.0303  -0.4428   0.5800   0.8941   1.0540   1.0217   0.6560   1.1220  -(
##
## sigma: 0.263239
## lambda (gene 1): 0.332611
## epsilon (gene 1): 0.978392
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 289.815
## delta (gene 1): 9.84954
## s (cell 1): 1.13874
## nu (cell 1): 1.07217
## theta (batch 1): 0.00492942
## betas:    0.9217  -0.1579   0.0796  -0.1028   0.5011   1.2107   1.2876   0.9430   1.1640   0.8103  -(
##
## sigma: 0.249364
## lambda (gene 1): 1.64408
## epsilon (gene 1): 0.843608
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 391.181
## delta (gene 1): 8.32492
## s (cell 1): 1.22709
## nu (cell 1): 1.09762
## theta (batch 1): 0.00740632
## betas:    1.5532  -0.2783  -0.1383  -0.5151   0.1641   1.2049   0.7395   1.1857   1.0907   0.6311   (
##
## sigma: 0.245525
## lambda (gene 1): 1.03043
## epsilon (gene 1): 0.630222
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 22960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 434.159
## delta (gene 1): 13.1615
## s (cell 1): 0.727515
## nu (cell 1): 1.0387
## theta (batch 1): 0.0397019
## betas:    1.6323  -0.1580   0.0758  -0.4313  -0.1818   1.3473   1.0232   0.3543   1.5139   0.0407  -(
##
## sigma: 0.232388
## lambda (gene 1): 0.406658
## epsilon (gene 1): 1.14915
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 23000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 304.296
## delta (gene 1): 11.1125
## s (cell 1): 1.02437
## nu (cell 1): 1.01326
## theta (batch 1): 0.00578862
## betas:    1.5084  -0.3935  -0.5116  -0.2049  -0.8223   1.8123   0.7537   1.0363   1.5750   0.8473   (
##
## sigma: 0.251072
## lambda (gene 1): 0.830718
## epsilon (gene 1): 0.933362
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 23040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 306.917
## delta (gene 1): 11.5737
## s (cell 1): 1.26997
## nu (cell 1): 1.00807
## theta (batch 1): 0.015698
## betas:    1.2492  -0.2950   0.5743  -0.8421  -0.0015   1.2394   1.2640   0.8217   1.5548   0.7059   (
##
## sigma: 0.250765
```

```
## lambda (gene 1): 1.00225
## epsilon (gene 1): 0.969956
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 23080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 495.921
## delta (gene 1): 9.2683
## s (cell 1): 1.56295
## nu (cell 1): 1.04534
## theta (batch 1): 0.0994002
## betas:    1.9731  -0.2498  -0.6004   0.1661  -0.7397   1.2991   0.8615   0.5489   1.2266   0.4765  -
##
## sigma: 0.249485
## lambda (gene 1): 0.298726
## epsilon (gene 1): 0.789696
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 23120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 924.856
## delta (gene 1): 8.78246
## s (cell 1): 1.11441
## nu (cell 1): 1.05206
## theta (batch 1): 0.0337567
## betas:    1.2157  -0.2173   0.6423  -0.5098  -0.2710   1.8518   0.8233   0.9232   1.4405   0.4791
##
## sigma: 0.253041
## lambda (gene 1): 0.384312
## epsilon (gene 1): 0.737209
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 23160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 571.371
## delta (gene 1): 8.87353
```

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## s (cell 1): 1.12422
## nu (cell 1): 1.04623
## theta (batch 1): 0.0380034
## betas:    0.1989  -0.0779   0.5840   0.3845   0.3934   1.8944   1.3453   0.9111   1.6666   0.5346  -0
##
## sigma: 0.255265
## lambda (gene 1): 0.402314
## epsilon (gene 1): 0.734726
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 23200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 430.167
## delta (gene 1): 14.3116
## s (cell 1): 0.814329
## nu (cell 1): 1.14058
## theta (batch 1): 0.052842
## betas:    1.1579  -0.1426  -0.3798  -0.0599  -0.1900   1.8119   0.9407   0.6194   1.5582   0.2583  -0
##
## sigma: 0.246986
## lambda (gene 1): 0.236733
## epsilon (gene 1): 1.21129
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 23240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.597
## delta (gene 1): 14.5698
## s (cell 1): 0.948954
## nu (cell 1): 1.05108
## theta (batch 1): 0.0209805
## betas:    1.3248  -0.1487  -0.1059  -0.7012   0.9033   0.6521   1.4868   0.4157   1.3556   0.5073  -0
##
## sigma: 0.262432
## lambda (gene 1): 0.395686
## epsilon (gene 1): 1.21725
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## -------------------------------------------------------
## Iteration 23280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 566.433
## delta (gene 1): 8.27605
## s (cell 1): 1.02244
## nu (cell 1): 1.07863
## theta (batch 1): 0.0313592
## betas:    1.0556  -0.1343  -0.8070   0.5097  -0.2654   1.4938   1.1813   0.7066   1.2708   0.6827  -(
##
## sigma: 0.249817
## lambda (gene 1): 1.03195
## epsilon (gene 1): 0.672712
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 23320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 435.922
## delta (gene 1): 9.11455
## s (cell 1): 1.02605
## nu (cell 1): 1.07431
## theta (batch 1): 0.112182
## betas:    1.1599  -0.1698  -0.1577  -0.2725   0.1247   1.1392   1.4040   0.5186   1.5056   0.4379  -(
##
## sigma: 0.258084
## lambda (gene 1): 0.909814
## epsilon (gene 1): 0.753435
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 23360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.159
## delta (gene 1): 8.75972
## s (cell 1): 0.872523
## nu (cell 1): 1.04701
## theta (batch 1): 0.0274777
## betas:    1.1622  -0.2411  -0.3330  -0.7671   0.4686   1.0143   1.3383   0.8208   1.4522   0.6065   (
##
## sigma: 0.25337
## lambda (gene 1): 1.63705
## epsilon (gene 1): 0.707263
```

```
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 23400 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 557.686
## delta (gene 1): 9.30902
## s (cell 1): 1.07025
## nu (cell 1): 1.03707
## theta (batch 1): 0.00546131
## betas:    0.9952  -0.0786  -0.4932   0.0455   0.4808   1.1910   1.0553   1.0113   0.8843   0.7597  -(
##
## sigma: 0.25087
## lambda (gene 1): 0.702145
## epsilon (gene 1): 0.766698
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 23440 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 857.561
## delta (gene 1): 13.2632
## s (cell 1): 1.12278
## nu (cell 1): 1.04549
## theta (batch 1): 0.00375645
## betas:    0.9543  -0.1589   0.1497  -0.3491   0.2507   1.4220   1.3649   0.6737   1.5710   0.3208   (
##
## sigma: 0.243972
## lambda (gene 1): 0.737394
## epsilon (gene 1): 1.13259
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 23480 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 314.222
## delta (gene 1): 12.067
## s (cell 1): 1.16637
## nu (cell 1): 1.05577
```

```
## theta (batch 1): 0.0150329
## betas:     1.0569  -0.2872  -0.2264  -0.7458   0.1312   1.4932   1.0516   1.0755   1.4863   0.8589
##
## sigma: 0.244832
## lambda (gene 1): 0.506567
## epsilon (gene 1): 1.03371
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 23520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 655.397
## delta (gene 1): 10.0306
## s (cell 1): 0.955663
## nu (cell 1): 1.10373
## theta (batch 1): 0.0124015
## betas:     1.6489  -0.1649  -0.4617  -0.3187  -0.2406   1.1433   1.3396   0.2387   1.4696   0.1741
##
## sigma: 0.262708
## lambda (gene 1): 1.69099
## epsilon (gene 1): 0.863971
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 23560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 698.728
## delta (gene 1): 7.94153
## s (cell 1): 1.1713
## nu (cell 1): 1.12217
## theta (batch 1): 0.00288647
## betas:     0.8057  -0.1488  -0.2304   0.1303   0.2165   1.3462   1.2554   0.9838   1.1465   1.0925
##
## sigma: 0.262925
## lambda (gene 1): 0.641564
## epsilon (gene 1): 0.611871
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 23600 out of 40000 has been completed.
```

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## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 587.067
## delta (gene 1): 11.6254
## s (cell 1): 0.958055
## nu (cell 1): 1.09186
## theta (batch 1): 0.0253621
## betas:    1.5556  -0.2382  -0.0888  -1.1014   0.4527   0.8568   1.1600   0.7699   1.1665   0.7576  -(
##
## sigma: 0.250813
## lambda (gene 1): 1.30113
## epsilon (gene 1): 1.00255
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 23640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 468.824
## delta (gene 1): 12.9726
## s (cell 1): 1.14482
## nu (cell 1): 1.02635
## theta (batch 1): 0.0197049
## betas:    1.2136  -0.1350   0.9062  -0.9096   0.2223   1.5112   0.7402   1.1347   0.8797   0.8061  -(
##
## sigma: 0.257331
## lambda (gene 1): 0.611553
## epsilon (gene 1): 1.10944
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 23680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 296.194
## delta (gene 1): 13.3797
## s (cell 1): 1.25449
## nu (cell 1): 1.15281
## theta (batch 1): 0.0176957
## betas:    1.2004  -0.0958  -0.2440   0.1560  -0.1225   1.1859   1.4695   0.4047   1.3155   0.4751  -(
##
## sigma: 0.249561
## lambda (gene 1): 0.216087
## epsilon (gene 1): 1.18364
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 23720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 653.154
## delta (gene 1): 9.9482
## s (cell 1): 1.36993
## nu (cell 1): 1.09675
## theta (batch 1): 0.0365223
## betas:    1.1624  -0.1030  -0.8283  -0.2424   0.8848   0.7810   1.2457   0.8787   1.0221   0.4896  -(
##
## sigma: 0.259998
## lambda (gene 1): 0.344385
## epsilon (gene 1): 0.850531
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 23760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 481.125
## delta (gene 1): 11.8331
## s (cell 1): 0.811996
## nu (cell 1): 1.05449
## theta (batch 1): 0.0507725
## betas:    1.0118  -0.2744  -0.1410  -0.8592   0.1031   1.4055   1.3610   0.7810   1.5549   0.9922  -(
##
## sigma: 0.261041
## lambda (gene 1): 0.760648
## epsilon (gene 1): 0.99933
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 23800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 544.121
## delta (gene 1): 8.92906
## s (cell 1): 1.28213
## nu (cell 1): 1.1264
## theta (batch 1): 0.0454732
## betas:    0.5755  -0.1329  -0.1304  -0.5912   0.8018   1.3502   1.3543   0.8613   1.6859   0.3014   (
```

```
##
## sigma: 0.248702
## lambda (gene 1): 1.02989
## epsilon (gene 1): 0.745047
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 23840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 885.914
## delta (gene 1): 8.55122
## s (cell 1): 0.905443
## nu (cell 1): 1.01832
## theta (batch 1): 0.0327172
## betas:    0.7441   -0.0418   -0.6355   -0.2374    0.9893    1.5815    0.9904    0.9425    1.1470    0.4543   -(
##
## sigma: 0.260021
## lambda (gene 1): 0.996477
## epsilon (gene 1): 0.696832
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 23880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1247.87
## delta (gene 1): 7.59376
## s (cell 1): 0.931674
## nu (cell 1): 1.04197
## theta (batch 1): 0.0281272
## betas:    1.6565   -0.2828   -0.5345   -0.7347   -0.5343    1.9050    0.3736    1.3476    0.7866    1.1242   -(
##
## sigma: 0.241158
## lambda (gene 1): 1.12677
## epsilon (gene 1): 0.564654
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 23920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 329.955
## delta (gene 1): 11.0214
## s (cell 1): 1.22031
## nu (cell 1): 1.05963
## theta (batch 1): 0.0576571
## betas:    1.7524  -0.3414   0.2862  -0.7926  -0.5581   1.4975   0.8863   0.6764   1.5168   0.7139
##
## sigma: 0.260889
## lambda (gene 1): 0.301721
## epsilon (gene 1): 0.929684
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 23960 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 512.812
## delta (gene 1): 10.4203
## s (cell 1): 1.06846
## nu (cell 1): 1.02902
## theta (batch 1): 0.0706157
## betas:    0.7486  -0.3157   0.2999  -0.5015   0.2885   1.4492   1.2031   1.2489   1.6063   0.9303
##
## sigma: 0.256869
## lambda (gene 1): 0.170531
## epsilon (gene 1): 0.864168
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 24000 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 613.386
## delta (gene 1): 11.7711
## s (cell 1): 1.15639
## nu (cell 1): 1.09083
## theta (batch 1): 0.0388245
## betas:    1.1905  -0.0931   0.8369  -0.4286  -0.0692   1.5379   0.7962   0.9413   1.0374   0.4329
##
## sigma: 0.244503
## lambda (gene 1): 0.610387
## epsilon (gene 1): 0.98783
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 24040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 486.013
## delta (gene 1): 8.87188
## s (cell 1): 1.54734
## nu (cell 1): 1.02942
## theta (batch 1): 0.088465
## betas:    0.7323  -0.3568  -0.3570  -0.4867  -0.2839   1.7885   1.1435   1.2345   1.8022   0.9607
##
## sigma: 0.266838
## lambda (gene 1): 0.871043
## epsilon (gene 1): 0.729064
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 24080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 487.539
## delta (gene 1): 9.10882
## s (cell 1): 0.961003
## nu (cell 1): 1.08344
## theta (batch 1): 0.0162476
## betas:    0.7600  -0.1350   0.2681  -0.7900   1.1462   0.7207   1.6323   1.0277   0.9782   0.9592
##
## sigma: 0.26105
## lambda (gene 1): 1.17015
## epsilon (gene 1): 0.744168
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 24120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 557.047
## delta (gene 1): 7.05571
## s (cell 1): 0.884618
## nu (cell 1): 1.09369
## theta (batch 1): 0.0260622
## betas:    1.7663  -0.2292  -0.4914  -0.3057  -0.7585   1.5047   1.0167   0.3931   1.4135   0.5124
##
## sigma: 0.238616
```

```
## lambda (gene 1): 0.794137
## epsilon (gene 1): 0.477531
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 422.508
## delta (gene 1): 8.2236
## s (cell 1): 1.12805
## nu (cell 1): 1.05169
## theta (batch 1): 0.00918711
## betas:    0.8940  -0.3851  -0.3308  -0.5220   0.0157   1.0807   1.6514   0.9625   1.6019   1.5385  -(
##
## sigma: 0.241229
## lambda (gene 1): 1.34162
## epsilon (gene 1): 0.615598
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 779.057
## delta (gene 1): 11.3614
## s (cell 1): 1.2818
## nu (cell 1): 0.973874
## theta (batch 1): 0.0131705
## betas:    1.1274  -0.2051  -0.6609   0.1944  -0.4560   1.7828   1.0615   0.7287   1.5162   0.6958  -(
##
## sigma: 0.258042
## lambda (gene 1): 0.679142
## epsilon (gene 1): 0.97154
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 502.091
## delta (gene 1): 10.5149
```

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## s (cell 1): 0.969356
## nu (cell 1): 0.995522
## theta (batch 1): 0.00691365
## betas:    0.8833  -0.1055  -0.0393  -0.1238   0.5571   1.0188   1.4653   1.0103   0.6861   1.2002  -(
##
## sigma: 0.252929
## lambda (gene 1): 0.444343
## epsilon (gene 1): 0.863667
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 24280 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 444.007
## delta (gene 1): 11.933
## s (cell 1): 1.15092
## nu (cell 1): 1.12219
## theta (batch 1): 0.00746461
## betas:    1.3188  -0.1822  -0.8175  -0.1817  -0.2312   1.6485   0.8095   0.8766   1.2628   0.4894  -(
##
## sigma: 0.258788
## lambda (gene 1): 0.779887
## epsilon (gene 1): 1.04975
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 24320 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 563.108
## delta (gene 1): 15.2676
## s (cell 1): 0.993312
## nu (cell 1): 1.01336
## theta (batch 1): 0.0262234
## betas:    1.1202  -0.2122  -1.0568   0.1791  -0.1055   1.4690   1.0424   1.1133   1.1131   0.8157   (
##
## sigma: 0.254623
## lambda (gene 1): 0.995512
## epsilon (gene 1): 1.27732
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ----------------------------------------------------------
## Iteration 24360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 388.597
## delta (gene 1): 10.5296
## s (cell 1): 1.08461
## nu (cell 1): 1.11507
## theta (batch 1): 0.00923172
## betas:    0.8083  -0.1724  -0.7276  -0.3959   0.7179   1.3782   1.0564   1.1763   1.2744   0.6897  -(
##
## sigma: 0.238633
## lambda (gene 1): 1.0725
## epsilon (gene 1): 0.923678
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 560.116
## delta (gene 1): 8.83958
## s (cell 1): 0.977179
## nu (cell 1): 1.05014
## theta (batch 1): 0.0115027
## betas:    0.5112  -0.0797  -0.7638   0.6162   0.0055   1.7897   1.1538   1.0658   1.1109   1.0219  -(
##
## sigma: 0.256817
## lambda (gene 1): 0.726058
## epsilon (gene 1): 0.76074
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 380.463
## delta (gene 1): 9.39299
## s (cell 1): 0.930464
## nu (cell 1): 1.03257
## theta (batch 1): 0.00787386
## betas:    0.6356  -0.0646  -0.2431   0.0523   0.4036   1.3596   1.3943   0.7481   1.3072   0.6237  -(
##
## sigma: 0.253071
## lambda (gene 1): 0.951865
## epsilon (gene 1): 0.790241
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 469.884
## delta (gene 1): 11.9183
## s (cell 1): 1.00489
## nu (cell 1): 1.14028
## theta (batch 1): 0.0107776
## betas:    1.0781  -0.2374  -1.3009   0.0253   0.5241   0.7529   1.3785   1.1189   1.0628   1.0528  -(
##
## sigma: 0.252286
## lambda (gene 1): 0.401818
## epsilon (gene 1): 1.01193
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 450.387
## delta (gene 1): 13.787
## s (cell 1): 1.05456
## nu (cell 1): 1.04273
## theta (batch 1): 0.00261899
## betas:    1.9477  -0.1999  -0.3953  -0.4890   0.2110   0.3343   1.5821   0.0091   1.6052  -0.1522   (
##
## sigma: 0.260187
## lambda (gene 1): 0.329125
## epsilon (gene 1): 1.17697
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 463.572
## delta (gene 1): 9.20744
## s (cell 1): 0.935687
## nu (cell 1): 0.996124
```

```
## theta (batch 1): 0.00274315
## betas:    1.5486  -0.1898  -0.3220  -0.2996  -0.0838   1.3551   0.8541   0.7775   1.0878   0.6922  -0
##
## sigma: 0.257955
## lambda (gene 1): 0.939024
## epsilon (gene 1): 0.762475
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 24600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 377.081
## delta (gene 1): 6.94175
## s (cell 1): 1.08417
## nu (cell 1): 1.06816
## theta (batch 1): 0.00213471
## betas:    0.9770  -0.1842   0.8208  -0.9834   0.2489   1.8153   1.0478   0.7559   1.5917   0.4212   (
##
## sigma: 0.246934
## lambda (gene 1): 2.97934
## epsilon (gene 1): 0.460461
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 24640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 633.61
## delta (gene 1): 15.398
## s (cell 1): 0.969849
## nu (cell 1): 1.00912
## theta (batch 1): 0.0012009
## betas:    1.3798  -0.2740   0.0747  -1.0583  -0.0023   1.3104   1.1639   0.8012   1.3919   0.6728   (
##
## sigma: 0.255028
## lambda (gene 1): 0.35282
## epsilon (gene 1): 1.29136
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 24680 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 427.77
## delta (gene 1): 7.56218
## s (cell 1): 1.04451
## nu (cell 1): 1.08226
## theta (batch 1): 0.00148604
## betas:    1.3914  -0.3148  -1.4503  -0.2572   0.3555   0.8549   1.3737   0.7686   1.4109   1.0335  -(
##
## sigma: 0.249121
## lambda (gene 1): 0.684888
## epsilon (gene 1): 0.556774
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 451.896
## delta (gene 1): 8.52536
## s (cell 1): 1.13293
## nu (cell 1): 1.16795
## theta (batch 1): 0.00153792
## betas:    0.7912  -0.0466   0.3965  -0.3289   0.2244   1.9738   1.0799   0.5932   1.4318   0.3911  -(
##
## sigma: 0.241927
## lambda (gene 1): 0.436645
## epsilon (gene 1): 0.682766
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 514.626
## delta (gene 1): 10.9407
## s (cell 1): 1.11156
## nu (cell 1): 1.08392
## theta (batch 1): 0.00174333
## betas:    0.6977  -0.2313  -0.0384  -0.7321   1.1726   0.8847   1.4875   1.1569   1.2508   1.2607  -(
##
## sigma: 0.263935
## lambda (gene 1): 0.302863
## epsilon (gene 1): 0.933926
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 446.416
## delta (gene 1): 9.11055
## s (cell 1): 1.03399
## nu (cell 1): 1.06486
## theta (batch 1): 0.0054636
## betas:    1.6877  -0.2662  -0.3139  -0.8692   0.2582   0.7436   1.4984   0.3353   1.5433   0.4973  -(
##
## sigma: 0.256079
## lambda (gene 1): 1.18032
## epsilon (gene 1): 0.727634
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 513.459
## delta (gene 1): 8.02787
## s (cell 1): 0.948733
## nu (cell 1): 1.04387
## theta (batch 1): 0.0309236
## betas:    1.1119  -0.2594  -0.6685   0.3663  -0.1265   1.2020   1.2102   1.1956   1.0761   1.1035  -(
##
## sigma: 0.243658
## lambda (gene 1): 0.731994
## epsilon (gene 1): 0.592752
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 24880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 703.366
## delta (gene 1): 11.4645
## s (cell 1): 0.878789
## nu (cell 1): 1.04015
## theta (batch 1): 0.0963107
## betas:    1.8192  -0.1116   0.2351  -0.1252  -0.4093   1.1843   1.0200   0.3693   1.0729   0.3012  -(
```

```
##
## sigma: 0.245942
## lambda (gene 1): 0.456144
## epsilon (gene 1): 1.02244
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 24920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 828.611
## delta (gene 1): 6.98998
## s (cell 1): 1.2398
## nu (cell 1): 1.06192
## theta (batch 1): 0.0301743
## betas:    0.8441  -0.2674  -0.1214  -0.4748   0.4130   1.0838   1.6321   0.7342   1.7209   0.8271   (
##
## sigma: 0.252637
## lambda (gene 1): 0.41216
## epsilon (gene 1): 0.476842
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 24960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.288
## delta (gene 1): 11.3775
## s (cell 1): 1.24638
## nu (cell 1): 1.14044
## theta (batch 1): 0.0370076
## betas:    0.9139  -0.1127  -0.3191  -0.5732   1.0027   0.7395   1.5074   0.8330   1.1341   0.5691  -(
##
## sigma: 0.25965
## lambda (gene 1): 0.636477
## epsilon (gene 1): 0.945365
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 261.61
## delta (gene 1): 8.48227
## s (cell 1): 1.35245
## nu (cell 1): 1.06468
## theta (batch 1): 0.0335331
## betas:     0.9422  -0.1734  -0.3137  -0.3052   0.4446   1.4550   1.0765   0.8548   1.5325   0.5570  -(
##
## sigma: 0.258063
## lambda (gene 1): 0.0929962
## epsilon (gene 1): 0.705278
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.255
## delta (gene 1): 12.3787
## s (cell 1): 0.941107
## nu (cell 1): 0.981189
## theta (batch 1): 0.0506839
## betas:     1.8969  -0.2282  -0.8524  -0.5727  -0.3338   1.1950   0.9288   0.5618   1.2537   0.3232  -(
##
## sigma: 0.249995
## lambda (gene 1): 0.671139
## epsilon (gene 1): 1.0557
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 867.779
## delta (gene 1): 7.77747
## s (cell 1): 0.934911
## nu (cell 1): 1.08306
## theta (batch 1): 0.0241626
## betas:     1.4893  -0.2365  -0.9133  -0.3708   0.4176   0.8482   1.3006   0.5195   1.4130   0.7742  -(
##
## sigma: 0.245396
## lambda (gene 1): 1.18315
## epsilon (gene 1): 0.611149
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 473.018
## delta (gene 1): 7.74727
## s (cell 1): 0.978642
## nu (cell 1): 1.14564
## theta (batch 1): 0.0639745
## betas:    1.3940  -0.3405  -0.1352  -0.8696   0.2426   0.9910   1.2436   0.8908   1.4040   1.1202  -(
##
## sigma: 0.261077
## lambda (gene 1): 0.870955
## epsilon (gene 1): 0.585331
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 503.063
## delta (gene 1): 9.47996
## s (cell 1): 1.04408
## nu (cell 1): 1.05631
## theta (batch 1): 0.0525994
## betas:    1.3632  -0.3173  -0.4844  -0.4123  -0.1266   0.9497   1.6033   0.4504   1.7910   0.6254   (
##
## sigma: 0.260801
## lambda (gene 1): 0.902713
## epsilon (gene 1): 0.792369
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 404.027
## delta (gene 1): 10.3878
## s (cell 1): 1.32337
## nu (cell 1): 1.03934
## theta (batch 1): 0.0435387
## betas:    1.3630  -0.1856  -0.4714  -0.0708   0.0820   0.8102   1.5396   0.4405   1.3926   0.5206  -(
##
## sigma: 0.253434
```

```
## lambda (gene 1): 1.04702
## epsilon (gene 1): 0.882881
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 25240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 542.369
## delta (gene 1): 10.0415
## s (cell 1): 1.05476
## nu (cell 1): 1.05366
## theta (batch 1): 0.0336417
## betas:    1.7447  -0.2498  -0.9846  -0.1986   0.1725   0.7563   1.0354   0.9198   0.9129   0.8231  -(
##
## sigma: 0.25753
## lambda (gene 1): 0.583466
## epsilon (gene 1): 0.864883
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 25280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.613
## delta (gene 1): 12.4297
## s (cell 1): 1.13301
## nu (cell 1): 1.07998
## theta (batch 1): 0.0252669
## betas:    0.8193  -0.1840   0.8244  -0.2012   0.0946   1.5807   1.0301   1.2615   1.0583   1.0380  -(
##
## sigma: 0.23771
## lambda (gene 1): 0.118333
## epsilon (gene 1): 1.04338
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 25320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 727.519
## delta (gene 1): 8.62924
```

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## s (cell 1): 0.980504
## nu (cell 1): 1.01284
## theta (batch 1): 0.0528571
## betas:    1.3760  -0.2398  -0.3322   0.2297  -0.4156   1.1098   1.3037   0.5944   1.4966   0.6479  -(
##
## sigma: 0.245646
## lambda (gene 1): 1.76663
## epsilon (gene 1): 0.720085
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 25360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 417.546
## delta (gene 1): 11.1547
## s (cell 1): 1.10167
## nu (cell 1): 1.12235
## theta (batch 1): 0.0321642
## betas:    1.1815  -0.2183  -0.6134  -0.2031   0.0518   1.3800   1.0476   0.9128   1.2747   0.8231  -(
##
## sigma: 0.242286
## lambda (gene 1): 0.366919
## epsilon (gene 1): 0.955287
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 25400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 468.553
## delta (gene 1): 13.1066
## s (cell 1): 1.5616
## nu (cell 1): 1.07846
## theta (batch 1): 0.0233572
## betas:    0.8856  -0.2069   0.2686  -0.3096  -0.3112   1.9340   1.0130   0.9472   1.5772   0.5286   (
##
## sigma: 0.254065
## lambda (gene 1): 0.4393
## epsilon (gene 1): 1.12207
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

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## ---------------------------------------------------------
## Iteration 25440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 696.049
## delta (gene 1): 10.2658
## s (cell 1): 1.21714
## nu (cell 1): 1.065
## theta (batch 1): 0.0267029
## betas:    1.2728  -0.3082  -0.7069  -0.4654  -0.5814   2.0187   0.8498   0.8152   1.7336   0.6868
##
## sigma: 0.258971
## lambda (gene 1): 1.01508
## epsilon (gene 1): 0.91082
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 25480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 815.725
## delta (gene 1): 10.157
## s (cell 1): 1.10468
## nu (cell 1): 1.02208
## theta (batch 1): 0.0169508
## betas:    0.8854  -0.1606   0.2828  -0.5011  -0.0568   1.9215   1.1905   0.5074   1.9116   0.1636
##
## sigma: 0.2427
## lambda (gene 1): 0.48213
## epsilon (gene 1): 0.861712
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 25520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 398.395
## delta (gene 1): 9.63947
## s (cell 1): 1.19506
## nu (cell 1): 1.00502
## theta (batch 1): 0.0164074
## betas:    1.3054  -0.1374   0.0575  -0.0049  -0.5046   1.7175   0.9504   0.5906   1.3977   0.3736  -0
##
## sigma: 0.253384
## lambda (gene 1): 0.779278
## epsilon (gene 1): 0.82839
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 25560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 820.783
## delta (gene 1): 7.72571
## s (cell 1): 1.05716
## nu (cell 1): 1.05636
## theta (batch 1): 0.0200208
## betas:    0.8583  -0.0907   0.0964  -0.1662   0.5942   1.5046   0.9081   1.1627   0.9800   0.7779  -(
##
## sigma: 0.253845
## lambda (gene 1): 0.909741
## epsilon (gene 1): 0.602757
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 25600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 644.686
## delta (gene 1): 13.4866
## s (cell 1): 0.86929
## nu (cell 1): 0.994699
## theta (batch 1): 0.108872
## betas:    1.0208  -0.1826  -0.3719  -0.2688   0.0438   1.6413   0.9498   0.9435   1.5011   0.2761   (
##
## sigma: 0.259459
## lambda (gene 1): 1.32378
## epsilon (gene 1): 1.15558
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 25640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 352.889
## delta (gene 1): 11.9292
## s (cell 1): 1.01265
## nu (cell 1): 1.09999
```

```
## theta (batch 1): 0.0446804
## betas:    1.3902  -0.2353  -0.9650   0.0398   0.0783   1.0582   1.1955   0.8011   1.2468   0.8056  -(
##
## sigma: 0.250577
## lambda (gene 1): 0.1327
## epsilon (gene 1): 1.04676
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 434.341
## delta (gene 1): 12.094
## s (cell 1): 1.00554
## nu (cell 1): 1.10851
## theta (batch 1): 0.0231849
## betas:    1.3554  -0.2745  -0.2393  -0.1688  -0.4803   1.6101   0.8319   1.1291   1.1922   0.7925  (
##
## sigma: 0.251942
## lambda (gene 1): 0.453886
## epsilon (gene 1): 1.02877
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 387.416
## delta (gene 1): 7.18484
## s (cell 1): 0.944882
## nu (cell 1): 1.1449
## theta (batch 1): 0.0415734
## betas:    0.9135  -0.1782  -0.1308  -0.2001   0.7311   0.9371   1.4949   0.7662   1.4103   0.7749  -(
##
## sigma: 0.255112
## lambda (gene 1): 1.33003
## epsilon (gene 1): 0.531643
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25760 out of 40000 has been completed.
```

```
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 492.063
## delta (gene 1): 8.15669
## s (cell 1): 1.41216
## nu (cell 1): 1.14311
## theta (batch 1): 0.0274848
## betas:    0.9727  -0.0796   0.5265  -0.9574   1.0744   1.0987   1.4016   0.4663   1.4677   0.3410  -(
##
## sigma: 0.264379
## lambda (gene 1): 1.10114
## epsilon (gene 1): 0.653798
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 25800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 510.691
## delta (gene 1): 8.67613
## s (cell 1): 1.08453
## nu (cell 1): 0.96569
## theta (batch 1): 0.0221623
## betas:    1.6700  -0.2298   0.3573  -0.7912  -0.3856   1.3819   1.0448   0.4396   1.5403   0.3567  -(
##
## sigma: 0.265222
## lambda (gene 1): 1.66855
## epsilon (gene 1): 0.712784
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 25840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 501.344
## delta (gene 1): 7.07194
## s (cell 1): 1.27459
## nu (cell 1): 1.0595
## theta (batch 1): 0.0221937
## betas:    1.0252  -0.1062   0.8799   0.0601  -0.1883   1.4719   1.3538   0.5900   1.2748   0.6462  -(
##
## sigma: 0.245258
## lambda (gene 1): 1.14538
## epsilon (gene 1): 0.515415
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 412.611
## delta (gene 1): 7.60975
## s (cell 1): 1.23867
## nu (cell 1): 1.05103
## theta (batch 1): 0.0171971
## betas:    1.3408  -0.2110   0.0388  -0.8066   0.1955   1.4176   0.8094   1.1029   0.9427   0.9750  -0
##
## sigma: 0.252684
## lambda (gene 1): 2.69576
## epsilon (gene 1): 0.54219
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 586.093
## delta (gene 1): 8.34568
## s (cell 1): 1.30446
## nu (cell 1): 1.04933
## theta (batch 1): 0.0280099
## betas:    1.2594  -0.1099  -0.8724   0.4628  -0.0329   1.1148   1.3002   0.6839   0.9196   0.8435  -0
##
## sigma: 0.254427
## lambda (gene 1): 0.745803
## epsilon (gene 1): 0.661081
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 25960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 491.406
## delta (gene 1): 10.9771
## s (cell 1): 0.879859
## nu (cell 1): 1.1563
## theta (batch 1): 0.0350858
## betas:    1.0300  -0.1483  -0.0599  -0.3949   0.1811   1.4555   1.2798   0.6359   1.3829   0.7506  -0
```

```
##
## sigma: 0.260957
## lambda (gene 1): 0.611183
## epsilon (gene 1): 0.941991
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 774.508
## delta (gene 1): 11.3713
## s (cell 1): 0.822703
## nu (cell 1): 1.09643
## theta (batch 1): 0.030118
## betas:    0.8711  -0.1730  -0.9991   0.3382   0.3667   1.1493   1.6092   0.5417   1.6130   0.7478  -(
##
## sigma: 0.24616
## lambda (gene 1): 0.275227
## epsilon (gene 1): 0.999851
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 603.462
## delta (gene 1): 10.6666
## s (cell 1): 0.974653
## nu (cell 1): 1.02712
## theta (batch 1): 0.0371487
## betas:    0.9702  -0.1233  -0.3931  -0.4253   0.4299   1.4425   1.2179   0.6390   1.5803   0.2198  -(
##
## sigma: 0.248603
## lambda (gene 1): 0.575978
## epsilon (gene 1): 0.927581
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 475.767
## delta (gene 1): 11.0438
## s (cell 1): 1.08761
## nu (cell 1): 1.04647
## theta (batch 1): 0.0446656
## betas:     1.5265   -0.1381   -0.3061   -0.5609   0.1927   1.0204   1.0031   0.8489   0.8786   0.4920   -0
##
## sigma: 0.247144
## lambda (gene 1): 0.189461
## epsilon (gene 1): 0.972038
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 325.89
## delta (gene 1): 9.2272
## s (cell 1): 0.829651
## nu (cell 1): 1.04487
## theta (batch 1): 0.0528674
## betas:     1.8970   -0.2567   -0.6590   -0.2277   -0.5858   1.2994   0.8793   0.6659   1.1067   0.6334   -0
##
## sigma: 0.263649
## lambda (gene 1): 0.632644
## epsilon (gene 1): 0.778613
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 550.336
## delta (gene 1): 11.4875
## s (cell 1): 0.994568
## nu (cell 1): 1.09164
## theta (batch 1): 0.148504
## betas:     2.1702   -0.3747   -0.5472   -1.0823   0.0039   0.8269   0.9361   0.5846   1.5218   0.3892
##
## sigma: 0.2538
## lambda (gene 1): 0.622073
## epsilon (gene 1): 1.00368
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 719.245
## delta (gene 1): 9.58048
## s (cell 1): 0.875087
## nu (cell 1): 1.08385
## theta (batch 1): 0.0859164
## betas:    1.3258  -0.2365   0.4525  -0.5019  -0.3749   1.5432   1.1049   0.7262   1.4134   0.7630  -(
##
## sigma: 0.262258
## lambda (gene 1): 0.732138
## epsilon (gene 1): 0.821058
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1132.27
## delta (gene 1): 8.45627
## s (cell 1): 0.864884
## nu (cell 1): 1.05628
## theta (batch 1): 0.0733073
## betas:    1.7376  -0.3088  -0.0628  -0.8283  -0.4664   1.4341   0.9399   0.7398   1.3558   0.7046  -(
##
## sigma: 0.243211
## lambda (gene 1): 0.744736
## epsilon (gene 1): 0.659291
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 776.636
## delta (gene 1): 8.28745
## s (cell 1): 0.723538
## nu (cell 1): 1.00994
## theta (batch 1): 0.0747329
## betas:    1.4759  -0.2157   0.0762  -0.8900   0.3277   1.1389   1.0376   0.8630   1.0518   0.7766  -(
##
## sigma: 0.241997
```

```
## lambda (gene 1): 1.75825
## epsilon (gene 1): 0.687399
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 453.726
## delta (gene 1): 7.41622
## s (cell 1): 1.33448
## nu (cell 1): 0.989291
## theta (batch 1): 0.0368944
## betas:    1.2030  -0.2019  -0.1654  -0.1300   0.0494   1.3113   1.0405   0.8258   1.5082   0.2805
##
## sigma: 0.238175
## lambda (gene 1): 1.07668
## epsilon (gene 1): 0.540735
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 375.072
## delta (gene 1): 14.9007
## s (cell 1): 1.07448
## nu (cell 1): 1.09507
## theta (batch 1): 0.0706131
## betas:    1.2689  -0.1984   0.6017  -0.2168  -0.4447   1.2812   1.4861   0.4273   1.4772   0.7890  -
##
## sigma: 0.239347
## lambda (gene 1): 0.626417
## epsilon (gene 1): 1.26676
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 654.385
## delta (gene 1): 8.50206
```

```
## s (cell 1): 1.08417
## nu (cell 1): 1.05066
## theta (batch 1): 0.0140562
## betas:    0.9324  -0.1959  -0.0056  -0.5040   0.3072   1.3269   1.3255   0.7325   1.5469   0.7109  -
##
## sigma: 0.25424
## lambda (gene 1): 1.06129
## epsilon (gene 1): 0.679404
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 284.07
## delta (gene 1): 8.49805
## s (cell 1): 0.983722
## nu (cell 1): 0.989358
## theta (batch 1): 0.012559
## betas:    1.2391  -0.2256  -0.3235  -0.3094  -0.4205   1.8198   0.9425   0.9371   1.1123   1.1451  -
##
## sigma: 0.25754
## lambda (gene 1): 0.946708
## epsilon (gene 1): 0.670694
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 432.022
## delta (gene 1): 9.55884
## s (cell 1): 1.18205
## nu (cell 1): 1.1021
## theta (batch 1): 0.00605852
## betas:    1.4483  -0.1110  -0.1675  -0.2647   0.1622   1.2590   0.7893   1.0401   0.6455   0.7315  -
##
## sigma: 0.263456
## lambda (gene 1): 1.41892
## epsilon (gene 1): 0.789766
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## --------------------------------------------------------
## Iteration 26520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 468.136
## delta (gene 1): 11.329
## s (cell 1): 0.98127
## nu (cell 1): 1.08309
## theta (batch 1): 0.00693718
## betas:    1.3242  -0.0954  -0.6428   0.1787   0.4404   0.6482   1.3246   0.8146   0.8182   0.5791  -0
##
## sigma: 0.251614
## lambda (gene 1): 1.64684
## epsilon (gene 1): 0.967488
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 249.916
## delta (gene 1): 8.45857
## s (cell 1): 1.26106
## nu (cell 1): 1.07468
## theta (batch 1): 0.00914563
## betas:    1.2539  -0.2492   0.3179  -0.5586   0.0877   1.1304   1.2799   0.7683   1.4102   0.7680  -0
##
## sigma: 0.254193
## lambda (gene 1): 1.14584
## epsilon (gene 1): 0.657376
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.588
## delta (gene 1): 13.0332
## s (cell 1): 1.29314
## nu (cell 1): 1.05985
## theta (batch 1): 0.0168342
## betas:    1.0815  -0.1456  -0.5760   0.0519   0.7432   1.0023   1.1105   0.9588   1.2019   0.5733  -0
##
## sigma: 0.25564
## lambda (gene 1): 0.521502
## epsilon (gene 1): 1.13155
```

```
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 574.419
## delta (gene 1): 13.3794
## s (cell 1): 1.00781
## nu (cell 1): 1.04039
## theta (batch 1): 0.0297174
## betas:    1.6791  -0.2461   0.2364  -1.4024   0.4594   1.0355   1.0514   0.4984   1.5003   0.4301  -
##
## sigma: 0.247029
## lambda (gene 1): 0.96798
## epsilon (gene 1): 1.1611
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 348.256
## delta (gene 1): 7.78659
## s (cell 1): 1.34597
## nu (cell 1): 1.03805
## theta (batch 1): 0.0256474
## betas:    1.5647  -0.0937   0.7787  -0.4468  -0.1818   1.3665   0.8030   0.6436   0.9629   0.4308  -
##
## sigma: 0.240909
## lambda (gene 1): 1.05828
## epsilon (gene 1): 0.591934
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 26720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 342.184
## delta (gene 1): 8.04549
## s (cell 1): 1.05365
## nu (cell 1): 1.03886
```

```
## theta (batch 1): 0.00188821
## betas:    0.9668  -0.2631  -0.1118  -0.2168  -0.0537   1.5456   1.3505   0.8283   1.4708   1.1441  -(
##
## sigma: 0.252015
## lambda (gene 1): 1.51881
## epsilon (gene 1): 0.643542
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 384.708
## delta (gene 1): 12.6373
## s (cell 1): 1.05516
## nu (cell 1): 1.08263
## theta (batch 1): 0.00299409
## betas:    1.1598  -0.1777   0.6771  -0.1824  -0.2966   1.7712   0.7229   1.2227   0.9031   0.9167  -(
##
## sigma: 0.247699
## lambda (gene 1): 0.572873
## epsilon (gene 1): 1.06593
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 526.056
## delta (gene 1): 11.318
## s (cell 1): 0.991112
## nu (cell 1): 1.02997
## theta (batch 1): 0.00312359
## betas:    2.0034  -0.2216  -0.3126  -0.6179   0.0479   0.9849   0.7842   0.7732   0.8868   0.5129  -(
##
## sigma: 0.250396
## lambda (gene 1): 1.26431
## epsilon (gene 1): 0.986092
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26840 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 575.526
## delta (gene 1): 7.22799
## s (cell 1): 1.00984
## nu (cell 1): 1.04943
## theta (batch 1): 0.00180013
## betas:    1.7727  -0.0795   0.8716  -1.1710   0.6950   0.7050   1.4207   0.0857   1.0156   0.5006  -
##
## sigma: 0.251979
## lambda (gene 1): 0.47873
## epsilon (gene 1): 0.496899
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 26880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 649.318
## delta (gene 1): 10.4798
## s (cell 1): 1.22152
## nu (cell 1): 1.04534
## theta (batch 1): 0.0125514
## betas:    1.7328  -0.2736   0.3066  -0.6479  -0.4862   1.3333   1.0580   0.4598   1.5575   0.5478  -
##
## sigma: 0.240914
## lambda (gene 1): 0.495812
## epsilon (gene 1): 0.891401
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 26920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 338.497
## delta (gene 1): 10.546
## s (cell 1): 1.10409
## nu (cell 1): 0.987091
## theta (batch 1): 0.00612828
## betas:    1.1255  -0.1789  -0.1752  -0.1105   0.4156   0.6021   1.7459   0.4134   1.5303   0.6192  -
##
## sigma: 0.258107
## lambda (gene 1): 1.14229
## epsilon (gene 1): 0.899318
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 26960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.04
## delta (gene 1): 14.1428
## s (cell 1): 1.04168
## nu (cell 1): 1.03322
## theta (batch 1): 0.00209821
## betas:    1.2182  -0.1373  -0.5646  -0.1216   0.3392   1.1425   1.2928   0.5984   1.2690   0.5659  -(
##
## sigma: 0.259523
## lambda (gene 1): 0.28644
## epsilon (gene 1): 1.22645
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 404.516
## delta (gene 1): 13.1854
## s (cell 1): 1.11097
## nu (cell 1): 1.07953
## theta (batch 1): 0.000539929
## betas:    1.1346  -0.1129  -0.1251  -0.3222   0.3929   1.3999   0.7200   1.1783   0.9831   0.4302  -(
##
## sigma: 0.257154
## lambda (gene 1): 0.313939
## epsilon (gene 1): 1.14013
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 476.428
## delta (gene 1): 10.2949
## s (cell 1): 1.0315
## nu (cell 1): 1.00557
## theta (batch 1): 0.00122242
## betas:    1.5725  -0.1628  -0.1686  -0.3925  -0.1593   1.1854   1.0036   0.7842   0.8798   0.7295  -(
```

```
## 
## sigma: 0.246027
## lambda (gene 1): 0.378927
## epsilon (gene 1): 0.876934
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 27080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 496.08
## delta (gene 1): 14.4828
## s (cell 1): 0.834956
## nu (cell 1): 0.994256
## theta (batch 1): 0.0195444
## betas:    1.4787  -0.2215  -0.2374  -0.8389   0.3430   0.9246   1.3634   0.3801   1.6548   0.3205  -(
## 
## sigma: 0.234692
## lambda (gene 1): 0.62353
## epsilon (gene 1): 1.22591
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 27120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 442.475
## delta (gene 1): 10.1295
## s (cell 1): 0.982278
## nu (cell 1): 1.00193
## theta (batch 1): 0.00690505
## betas:    1.4007  -0.1950  -0.2308  -0.0605  -0.2675   1.5345   0.6649   1.2052   0.7942   0.9058  -(
## 
## sigma: 0.245968
## lambda (gene 1): 0.549804
## epsilon (gene 1): 0.854215
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 27160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 491.972
## delta (gene 1): 8.35334
## s (cell 1): 1.1081
## nu (cell 1): 1.09575
## theta (batch 1): 0.00501611
## betas:      0.9104   -0.2082   -0.1406   -0.7308    0.6788    1.1100    1.5436    0.5226    1.8799    0.3588
##
## sigma: 0.247648
## lambda (gene 1): 0.401262
## epsilon (gene 1): 0.669637
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 27200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 551.974
## delta (gene 1): 12.2885
## s (cell 1): 1.09669
## nu (cell 1): 1.11478
## theta (batch 1): 0.00906335
## betas:      1.3491   -0.2001   -0.0722   -1.0916    0.1971    1.4325    0.9621    0.9031    1.0939    0.7821   -
##
## sigma: 0.255573
## lambda (gene 1): 0.941594
## epsilon (gene 1): 1.05528
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 27240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 710.666
## delta (gene 1): 9.50202
## s (cell 1): 1.21554
## nu (cell 1): 1.06224
## theta (batch 1): 0.00319171
## betas:      1.1225   -0.0109    0.1833   -0.8018    0.6593    1.2436    1.3579    0.3123    1.1936    0.3846   -
##
## sigma: 0.25623
## lambda (gene 1): 1.42101
## epsilon (gene 1): 0.813507
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 359.359
## delta (gene 1): 11.3263
## s (cell 1): 1.12039
## nu (cell 1): 1.11858
## theta (batch 1): 0.00334086
## betas:    1.3720  -0.1090  -0.0222  -0.4809   0.4038   1.3748   0.7732   0.8270   1.0921   0.3223  -(
##
## sigma: 0.259097
## lambda (gene 1): 0.172559
## epsilon (gene 1): 0.987002
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 664.363
## delta (gene 1): 8.43694
## s (cell 1): 1.21043
## nu (cell 1): 1.17898
## theta (batch 1): 0.00251432
## betas:    1.3209  -0.1527  -0.2088  -0.6004   0.5360   1.1246   1.0204   0.7693   1.2555   0.4967  -(
##
## sigma: 0.255292
## lambda (gene 1): 0.770069
## epsilon (gene 1): 0.710011
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 341.884
## delta (gene 1): 9.69165
## s (cell 1): 0.995532
## nu (cell 1): 1.04183
## theta (batch 1): 0.00888094
## betas:    0.8586  -0.0823  -0.0400   0.4281  -0.0348   1.7866   1.2738   0.4504   1.7096   0.1145  -(
##
## sigma: 0.24027
```

```
## lambda (gene 1): 0.611742
## epsilon (gene 1): 0.852221
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 27400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 436.009
## delta (gene 1): 9.82716
## s (cell 1): 1.06076
## nu (cell 1): 1.07235
## theta (batch 1): 0.00338767
## betas:    1.3349  -0.2076  -0.4281  -0.1671  -0.0289   1.2382   1.2785   0.5856   1.4087   0.5726  -(
##
## sigma: 0.23837
## lambda (gene 1): 0.624125
## epsilon (gene 1): 0.82356
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 27440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.184
## delta (gene 1): 12.8094
## s (cell 1): 0.98285
## nu (cell 1): 1.02852
## theta (batch 1): 0.0019557
## betas:    0.9827  -0.2263   0.0208  -0.8194   0.1123   1.9088   0.5549   1.5516   0.9421   0.9698   (
##
## sigma: 0.254506
## lambda (gene 1): 0.30721
## epsilon (gene 1): 1.06593
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 27480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 701.557
## delta (gene 1): 9.67738
```

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## s (cell 1): 1.10565
## nu (cell 1): 1.05361
## theta (batch 1): 0.00924247
## betas:    1.4852  -0.1604   0.2344  -0.6668   0.7040   0.6180   1.2572   0.8484   0.7542   0.9941  -(
##
## sigma: 0.256907
## lambda (gene 1): 1.05406
## epsilon (gene 1): 0.820409
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 27520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.399
## delta (gene 1): 8.36481
## s (cell 1): 1.15988
## nu (cell 1): 1.09861
## theta (batch 1): 0.0204741
## betas:    1.3594  -0.2484   0.5675  -0.5553  -0.0922   1.3238   1.1132   0.6954   1.5097   0.5364   (
##
## sigma: 0.257766
## lambda (gene 1): 1.66745
## epsilon (gene 1): 0.637429
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 27560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 930.555
## delta (gene 1): 11.1126
## s (cell 1): 0.90828
## nu (cell 1): 1.0503
## theta (batch 1): 0.00894124
## betas:    1.9206  -0.3250   0.0695  -1.0466  -0.1807   1.2197   0.6814   0.9928   1.0396   0.9195  -(
##
## sigma: 0.250491
## lambda (gene 1): 0.434369
## epsilon (gene 1): 0.9501
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ---------------------------------------------------------
## Iteration 27600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 566.816
## delta (gene 1): 13.0344
## s (cell 1): 1.05249
## nu (cell 1): 1.0418
## theta (batch 1): 0.00442302
## betas:    0.8206  -0.2308   0.2891  -0.2604  -0.2726   1.8984   1.2519   0.6802   1.8519   0.6048
##
## sigma: 0.249159
## lambda (gene 1): 0.166492
## epsilon (gene 1): 1.1057
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 542.167
## delta (gene 1): 9.69916
## s (cell 1): 1.13124
## nu (cell 1): 1.02872
## theta (batch 1): 0.00299575
## betas:    1.1100  -0.1403  -0.4960   0.0123   0.1335   1.3631   1.1131   0.9569   0.8537   1.1912
##
## sigma: 0.24556
## lambda (gene 1): 0.446495
## epsilon (gene 1): 0.812041
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 553.208
## delta (gene 1): 10.9499
## s (cell 1): 1.1252
## nu (cell 1): 1.07613
## theta (batch 1): 0.00415634
## betas:    1.0660  -0.1399  -0.0804   0.1015   0.2371   0.9235   1.4727   0.6729   1.3648   0.3467
##
## sigma: 0.248276
## lambda (gene 1): 0.374954
## epsilon (gene 1): 0.932867
```

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## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 27720 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 306.104
## delta (gene 1): 11.7024
## s (cell 1): 1.03336
## nu (cell 1): 1.02184
## theta (batch 1): 0.00789777
## betas:    1.3053  -0.2663   0.2235  -0.1125  -0.7845   1.9239   0.7471   1.1256   1.1379   1.0417  -(
##
## sigma: 0.252596
## lambda (gene 1): 0.632948
## epsilon (gene 1): 0.987819
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 27760 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 406.648
## delta (gene 1): 7.38204
## s (cell 1): 1.06635
## nu (cell 1): 1.06623
## theta (batch 1): 0.00531632
## betas:    1.4204  -0.1173  -0.2187   0.5721  -0.3121   1.2038   1.2454   0.5536   1.0192   0.5783  -(
##
## sigma: 0.250668
## lambda (gene 1): 1.9775
## epsilon (gene 1): 0.516609
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 27800 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.566
## delta (gene 1): 11.1332
## s (cell 1): 1.15007
## nu (cell 1): 1.08947
```

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## theta (batch 1): 0.0216266
## betas:    1.2709  -0.2501  -0.0353   0.2149  -0.4154   1.2460   1.5740   0.2244   1.8600   0.6118  -(
##
## sigma: 0.23576
## lambda (gene 1): 0.228739
## epsilon (gene 1): 0.970847
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 587.501
## delta (gene 1): 9.10462
## s (cell 1): 1.47823
## nu (cell 1): 1.14136
## theta (batch 1): 0.0615491
## betas:    1.3438  -0.2655  -0.0090  -0.5860  -0.0159   1.2368   1.1118   0.7371   1.5701   0.5929  -(
##
## sigma: 0.255008
## lambda (gene 1): 0.870476
## epsilon (gene 1): 0.766029
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 467.755
## delta (gene 1): 6.39511
## s (cell 1): 0.883287
## nu (cell 1): 1.03396
## theta (batch 1): 0.0428066
## betas:    1.7311  -0.2137  -0.1591  -0.5981   0.2918   0.8693   1.2496   0.5051   1.1000   0.7740  -(
##
## sigma: 0.250282
## lambda (gene 1): 1.08113
## epsilon (gene 1): 0.389246
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27920 out of 40000 has been completed.
```

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## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 305.715
## delta (gene 1): 12.0934
## s (cell 1): 1.14411
## nu (cell 1): 1.03448
## theta (batch 1): 0.0492477
## betas:    1.2699  -0.2051   0.2813  -0.1359  -0.5702   1.4678   1.1390   0.6833   1.5365   0.2902   (
##
## sigma: 0.269586
## lambda (gene 1): 0.64918
## epsilon (gene 1): 1.01321
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 27960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 334.125
## delta (gene 1): 11.0471
## s (cell 1): 1.38037
## nu (cell 1): 1.07002
## theta (batch 1): 0.0161668
## betas:    1.0902  -0.2180   0.1030  -0.6874  -0.3949   1.8387   1.0353   0.8672   1.4006   0.7858   -(
##
## sigma: 0.262287
## lambda (gene 1): 0.866999
## epsilon (gene 1): 0.959103
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 28000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 684.685
## delta (gene 1): 7.17627
## s (cell 1): 0.913399
## nu (cell 1): 0.998775
## theta (batch 1): 0.0413066
## betas:    1.2770  -0.2535  -0.5726  -1.0240   0.1078   1.2358   1.4079   0.4714   1.6658   0.5859   (
##
## sigma: 0.24238
## lambda (gene 1): 0.628587
## epsilon (gene 1): 0.505123
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 28040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 535.133
## delta (gene 1): 8.51819
## s (cell 1): 1.1334
## nu (cell 1): 1.11697
## theta (batch 1): 0.0379839
## betas:    1.2426  -0.1254  -0.9168  -0.2099   0.3540   1.0722   1.2009   0.7121   1.0764   0.7111  -(
##
## sigma: 0.244994
## lambda (gene 1): 1.07399
## epsilon (gene 1): 0.675776
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 28080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.201
## delta (gene 1): 9.92235
## s (cell 1): 1.1624
## nu (cell 1): 1.09626
## theta (batch 1): 0.0163586
## betas:    0.9186  -0.2176  -0.9385  -0.7018   0.6820   1.2739   1.2436   0.7806   1.6949   0.6653  -(
##
## sigma: 0.244712
## lambda (gene 1): 0.468367
## epsilon (gene 1): 0.857575
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 28120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 816.045
## delta (gene 1): 10.1949
## s (cell 1): 1.0715
## nu (cell 1): 1.1154
## theta (batch 1): 0.0192443
## betas:    0.1578  -0.0732  -0.2475  -0.5219   1.1707   1.4270   1.3970   1.1507   1.3516   0.8367  -(
```

```
##
## sigma: 0.257021
## lambda (gene 1): 0.789655
## epsilon (gene 1): 0.878377
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 28160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 728.938
## delta (gene 1): 14.5777
## s (cell 1): 1.35457
## nu (cell 1): 1.04484
## theta (batch 1): 0.033232
## betas:    1.0205  -0.0869  -0.4744  -0.3727   0.6099   1.1959   1.0888   1.0359   0.7547   1.0355  -
##
## sigma: 0.239471
## lambda (gene 1): 0.193312
## epsilon (gene 1): 1.26356
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 28200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 552.622
## delta (gene 1): 9.88589
## s (cell 1): 1.10176
## nu (cell 1): 1.07848
## theta (batch 1): 0.00150172
## betas:    0.9222  -0.0822  -0.5885   0.0530   0.2482   1.4625   1.1001   1.0429   0.8581   0.7753  -(
##
## sigma: 0.259135
## lambda (gene 1): 0.374155
## epsilon (gene 1): 0.858265
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 28240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 554.725
## delta (gene 1): 9.22634
## s (cell 1): 1.04615
## nu (cell 1): 1.053
## theta (batch 1): 0.000719984
## betas:    1.5362  -0.1100   0.6755  -0.8997   0.0218   1.4010   1.0595   0.4895   1.0221   0.4267  -(
##
## sigma: 0.26491
## lambda (gene 1): 0.492601
## epsilon (gene 1): 0.744449
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 28280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 274.509
## delta (gene 1): 15.1057
## s (cell 1): 1.0957
## nu (cell 1): 1.05724
## theta (batch 1): 0.000734798
## betas:    1.2874  -0.1807  -0.4444  -0.2918  -0.4886   1.8542   0.8900   0.6262   1.4995   0.5342  -(
##
## sigma: 0.247612
## lambda (gene 1): 0.48921
## epsilon (gene 1): 1.29367
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 28320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 431.172
## delta (gene 1): 11.9659
## s (cell 1): 1.05247
## nu (cell 1): 1.05435
## theta (batch 1): 0.00130929
## betas:    1.4819  -0.2127  -0.1002  -0.9454   0.2767   1.2710   0.8999   0.8580   1.1040   0.7635  -(
##
## sigma: 0.234148
## lambda (gene 1): 0.519988
## epsilon (gene 1): 1.02286
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 28360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 332.202
## delta (gene 1): 11.5704
## s (cell 1): 0.987172
## nu (cell 1): 0.966773
## theta (batch 1): 0.00712855
## betas:    1.4595  -0.1495  -0.1278  -0.0364  -0.6191   2.1728   0.3690   0.9414   1.1870   0.2402  -(
##
## sigma: 0.25574
## lambda (gene 1): 0.83264
## epsilon (gene 1): 0.997221
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 28400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1042.96
## delta (gene 1): 8.27147
## s (cell 1): 1.16396
## nu (cell 1): 1.11949
## theta (batch 1): 0.00962619
## betas:    0.9392  -0.1450  -0.8981   0.0494   0.7853   0.8677   1.2528   1.1362   0.9682   0.8938  -(
##
## sigma: 0.257608
## lambda (gene 1): 2.33641
## epsilon (gene 1): 0.635662
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 28440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 334.696
## delta (gene 1): 9.72333
## s (cell 1): 1.01991
## nu (cell 1): 1.11042
## theta (batch 1): 0.0143836
## betas:    0.6361  -0.0970   0.0322   0.0616   0.3099   1.5153   1.5272   0.4603   1.8153   0.1915  -(
##
## sigma: 0.252924
```

```
## lambda (gene 1): 2.16199
## epsilon (gene 1): 0.822288
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 28480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 529.322
## delta (gene 1): 7.95603
## s (cell 1): 0.964796
## nu (cell 1): 1.04711
## theta (batch 1): 0.00394935
## betas:    0.9036  -0.2174  -0.0447  -0.9596   0.7323   1.2988   1.2596   1.0385   1.1619   1.2010  -(
##
## sigma: 0.25405
## lambda (gene 1): 0.558061
## epsilon (gene 1): 0.623581
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 28520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 635.339
## delta (gene 1): 9.70068
## s (cell 1): 1.02319
## nu (cell 1): 1.01816
## theta (batch 1): 0.000224249
## betas:    1.2450  -0.1286  -0.5121  -0.5322   0.8086   0.8582   1.2627   0.6449   1.3096   0.3113  -(
##
## sigma: 0.254824
## lambda (gene 1): 0.338074
## epsilon (gene 1): 0.814105
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 28560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 377.944
## delta (gene 1): 8.03994
```

```
## s (cell 1): 1.0654
## nu (cell 1): 1.07352
## theta (batch 1): 0.000841803
## betas:    0.6227  -0.0316  -0.2852   0.0474   0.9954   0.9294   1.5204   0.7884   1.1473   0.7180  -
##
## sigma: 0.242521
## lambda (gene 1): 1.12937
## epsilon (gene 1): 0.680555
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 28600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 489.707
## delta (gene 1): 11.542
## s (cell 1): 1.34256
## nu (cell 1): 1.15621
## theta (batch 1): 0.0250971
## betas:    1.4070  -0.1636   0.1147  -0.6898  -0.1089   1.3669   1.0781   0.6995   1.1176   0.7517  -
##
## sigma: 0.246698
## lambda (gene 1): 1.17148
## epsilon (gene 1): 1.01707
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 28640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.864
## delta (gene 1): 12.0531
## s (cell 1): 1.03897
## nu (cell 1): 1.03249
## theta (batch 1): 0.0120322
## betas:    0.8739  -0.1367  -0.1861  -0.5444   0.5150   1.4786   1.1886   0.8084   1.4513   0.4684  -
##
## sigma: 0.251869
## lambda (gene 1): 0.627513
## epsilon (gene 1): 1.03363
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## --------------------------------------------------------
## Iteration 28680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 646.281
## delta (gene 1): 8.42121
## s (cell 1): 1.04913
## nu (cell 1): 1.04549
## theta (batch 1): 0.00971118
## betas:    0.8197  -0.1757  -0.1885  -0.0750  -0.0584   1.5258   1.4104   0.6671   1.6218   0.6015  -(
##
## sigma: 0.261735
## lambda (gene 1): 0.375918
## epsilon (gene 1): 0.675685
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 28720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 538.132
## delta (gene 1): 7.72862
## s (cell 1): 1.00676
## nu (cell 1): 1.03487
## theta (batch 1): 0.00980788
## betas:    0.8446  -0.2110  -0.4871  -0.3026   0.5830   1.3987   1.0929   1.1892   1.3294   0.6915   (
##
## sigma: 0.250727
## lambda (gene 1): 0.573256
## epsilon (gene 1): 0.597655
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 28760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 605.587
## delta (gene 1): 13.4246
## s (cell 1): 1.00155
## nu (cell 1): 1.03872
## theta (batch 1): 0.0255176
## betas:    0.9450  -0.2292   0.0386  -0.3892   0.2065   1.4123   1.2442   0.8728   1.4491   0.9943  -(
##
## sigma: 0.24988
## lambda (gene 1): 0.332532
## epsilon (gene 1): 1.15783
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 28800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 641.654
## delta (gene 1): 9.80381
## s (cell 1): 1.11856
## nu (cell 1): 1.04937
## theta (batch 1): 0.022616
## betas:    1.3384  -0.2067  -0.1293  -0.0025   0.1151   1.1043   1.2342   0.6418   1.4467   0.3570   (
##
## sigma: 0.25219
## lambda (gene 1): 1.77106
## epsilon (gene 1): 0.806496
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 28840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 645.091
## delta (gene 1): 7.99664
## s (cell 1): 1.24183
## nu (cell 1): 1.17124
## theta (batch 1): 0.00837907
## betas:    1.2528  -0.3917   0.3901  -0.9873  -0.2615   1.4450   1.2002   0.9081   1.7595   0.9860   (
##
## sigma: 0.250158
## lambda (gene 1): 0.473208
## epsilon (gene 1): 0.596511
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 28880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 360.641
## delta (gene 1): 11.8749
## s (cell 1): 1.09939
## nu (cell 1): 1.04765
```

```
## theta (batch 1): 0.0246144
## betas:    1.4077  -0.2782   0.5512  -0.1217  -0.6352   1.5905   0.9251   0.9200   1.3364   0.8786  -(
##
## sigma: 0.251912
## lambda (gene 1): 0.384818
## epsilon (gene 1): 1.02842
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 28920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 302.108
## delta (gene 1): 8.79801
## s (cell 1): 1.63925
## nu (cell 1): 1.13751
## theta (batch 1): 0.0617862
## betas:    1.5676  -0.3310  -0.0221   0.3144  -0.8312   1.2605   1.2560   0.5641   1.6257   0.7309   (
##
## sigma: 0.262469
## lambda (gene 1): 0.344246
## epsilon (gene 1): 0.69652
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 28960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 794.384
## delta (gene 1): 9.74525
## s (cell 1): 1.61036
## nu (cell 1): 1.09778
## theta (batch 1): 0.154464
## betas:    1.8798  -0.1417   0.4359   0.1206  -0.3188   0.9261   1.1710   0.4391   0.8162   0.6057  -(
##
## sigma: 0.257762
## lambda (gene 1): 2.4835
## epsilon (gene 1): 0.81274
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 29000 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 382.141
## delta (gene 1): 12.0314
## s (cell 1): 1.10568
## nu (cell 1): 1.02377
## theta (batch 1): 0.0220338
## betas:    1.5512  -0.2729   0.2342  -0.8189   0.5352   0.5180   1.7008   0.2830   1.5544   0.7797  -(
##
## sigma: 0.25848
## lambda (gene 1): 0.374139
## epsilon (gene 1): 1.02845
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 29040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 641.608
## delta (gene 1): 10.7511
## s (cell 1): 1.02186
## nu (cell 1): 1.10216
## theta (batch 1): 0.00182179
## betas:    0.8642  -0.1065   0.1851  -0.0711   0.2818   1.6267   0.8339   1.2292   0.9352   0.6493  -(
##
## sigma: 0.256096
## lambda (gene 1): 0.652339
## epsilon (gene 1): 0.90312
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 29080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.934
## delta (gene 1): 9.48937
## s (cell 1): 1.1915
## nu (cell 1): 1.04678
## theta (batch 1): 0.0159869
## betas:    0.9929  -0.1484  -0.0211  -0.6645   1.0494   1.1668   0.6877   1.5916   0.7057   0.8614  -(
##
## sigma: 0.244533
## lambda (gene 1): 1.08985
## epsilon (gene 1): 0.803679
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 29120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.988
## delta (gene 1): 10.918
## s (cell 1): 1.10815
## nu (cell 1): 1.10819
## theta (batch 1): 0.0304865
## betas:    1.1716  -0.1130   0.7036  -0.6475   0.5413   1.4688   0.9173   0.9439   0.7757   1.2034  -
##
## sigma: 0.252267
## lambda (gene 1): 0.465466
## epsilon (gene 1): 0.911627
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 29160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 547.182
## delta (gene 1): 8.38203
## s (cell 1): 1.11267
## nu (cell 1): 1.05143
## theta (batch 1): 0.052373
## betas:    1.4987  -0.2108  -0.4721  -0.1895  -0.4311   1.7543   0.6870   1.0162   0.9472   0.8934  -
##
## sigma: 0.25999
## lambda (gene 1): 0.879374
## epsilon (gene 1): 0.650468
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 29200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 381.346
## delta (gene 1): 8.3933
## s (cell 1): 0.992052
## nu (cell 1): 0.995218
## theta (batch 1): 0.0264269
## betas:    1.3541  -0.2552  -0.7799  -0.4862   0.2820   1.1301   0.9728   1.1626   0.8858   1.2740  -
```

```
## 
## sigma: 0.252853
## lambda (gene 1): 0.996303
## epsilon (gene 1): 0.650479
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 660.824
## delta (gene 1): 9.40796
## s (cell 1): 0.866792
## nu (cell 1): 1.05271
## theta (batch 1): 0.0303801
## betas:    1.5819  -0.2596   0.4424  -0.6710  -0.2602   1.5805   0.7226   0.7933   1.5396   0.2736   
## 
## sigma: 0.256825
## lambda (gene 1): 0.259803
## epsilon (gene 1): 0.809321
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 488.746
## delta (gene 1): 10.0605
## s (cell 1): 1.74634
## nu (cell 1): 1.08167
## theta (batch 1): 0.0654521
## betas:    0.9529  -0.1610   0.5485   0.0216   0.1152   1.1115   1.6866   0.3608   1.8112   0.3357  -0
## 
## sigma: 0.249016
## lambda (gene 1): 0.444063
## epsilon (gene 1): 0.886869
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 544.415
## delta (gene 1): 11.2618
## s (cell 1): 1.18816
## nu (cell 1): 1.06112
## theta (batch 1): 0.0481507
## betas:     1.1931  -0.2475   0.3137  -0.3557   0.2162   0.9919   1.2103   0.9937   1.1354   1.2128  -(
##
## sigma: 0.263498
## lambda (gene 1): 0.701895
## epsilon (gene 1): 0.954631
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 29360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 687.433
## delta (gene 1): 7.25667
## s (cell 1): 1.192
## nu (cell 1): 1.07132
## theta (batch 1): 0.0482437
## betas:     1.2169  -0.2123   1.0908  -0.1259  -0.2580   1.3134   1.1252   0.9383   1.1143   0.8111   (
##
## sigma: 0.25917
## lambda (gene 1): 2.0677
## epsilon (gene 1): 0.527796
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 29400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 381.013
## delta (gene 1): 8.19801
## s (cell 1): 1.08335
## nu (cell 1): 0.985215
## theta (batch 1): 0.0225543
## betas:     1.6664  -0.2748   0.6257  -0.4550  -0.6837   1.4255   1.0070   0.5827   1.5473   0.3725   (
##
## sigma: 0.238038
## lambda (gene 1): 0.446471
## epsilon (gene 1): 0.667708
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 341.223
## delta (gene 1): 9.77965
## s (cell 1): 1.56753
## nu (cell 1): 1.09193
## theta (batch 1): 0.0507997
## betas:    0.9410  -0.1414   0.0876   0.9609  -0.4546   1.3769   1.2965   0.9434   1.0097   1.0597  -(
##
## sigma: 0.246022
## lambda (gene 1): 1.08357
## epsilon (gene 1): 0.842192
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.362
## delta (gene 1): 8.36439
## s (cell 1): 0.943494
## nu (cell 1): 1.07183
## theta (batch 1): 0.0263622
## betas:    0.9533  -0.1600   0.1614  -0.3446   0.5120   1.2530   1.4094   0.6751   1.4037   0.7454  -(
##
## sigma: 0.250572
## lambda (gene 1): 0.871928
## epsilon (gene 1): 0.665888
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 483.74
## delta (gene 1): 8.03357
## s (cell 1): 1.14682
## nu (cell 1): 1.13727
## theta (batch 1): 0.0156587
## betas:    1.6409  -0.2462   0.2272  -0.7584   0.0978   1.1477   0.8887   0.7780   1.2323   0.7957  -(
##
## sigma: 0.25749
```

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## lambda (gene 1): 0.744438
## epsilon (gene 1): 0.644852
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 540.288
## delta (gene 1): 9.40855
## s (cell 1): 1.01329
## nu (cell 1): 1.05599
## theta (batch 1): 0.00301121
## betas:    1.0205  -0.2695  -0.0341  -0.4395  -0.2207   1.7783   0.7746   1.3375   1.1803   1.1995  -(
##
## sigma: 0.235275
## lambda (gene 1): 0.967073
## epsilon (gene 1): 0.785813
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 446.597
## delta (gene 1): 7.13428
## s (cell 1): 1.19428
## nu (cell 1): 1.15136
## theta (batch 1): 0.00208587
## betas:    2.0440  -0.2430  -0.2919  -1.0760  -0.1124   1.0377   1.0215   0.2898   1.4529   0.1535  -(
##
## sigma: 0.260533
## lambda (gene 1): 1.19638
## epsilon (gene 1): 0.494058
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 503.5
## delta (gene 1): 8.40488
```

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## s (cell 1): 1.16599
## nu (cell 1): 1.05194
## theta (batch 1): 0.0129779
## betas:    0.5476  -0.1324   0.3562   0.1436   0.0019   1.7740   1.3347   0.9923   1.2885   0.9138  -(
##
## sigma: 0.273207
## lambda (gene 1): 0.448567
## epsilon (gene 1): 0.692751
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 29680 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 553.593
## delta (gene 1): 8.47726
## s (cell 1): 0.749914
## nu (cell 1): 1.04651
## theta (batch 1): 0.0456815
## betas:    1.0788  -0.2640  -0.4844  -0.4239   0.0049   1.3698   1.1826   0.9815   1.3436   0.9686  -(
##
## sigma: 0.248907
## lambda (gene 1): 1.68171
## epsilon (gene 1): 0.681565
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 29720 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 414.44
## delta (gene 1): 9.29857
## s (cell 1): 1.11636
## nu (cell 1): 1.11464
## theta (batch 1): 0.0290222
## betas:    1.3433  -0.2040  -0.1308  -1.2186   0.5998   1.3456   0.8375   0.9316   1.2463   0.5787  -(
##
## sigma: 0.248418
## lambda (gene 1): 0.45277
## epsilon (gene 1): 0.770186
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ---------------------------------------------------------
## Iteration 29760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.493
## delta (gene 1): 9.72126
## s (cell 1): 1.18024
## nu (cell 1): 1.11066
## theta (batch 1): 0.0426739
## betas:    1.7507  -0.2174   0.0714  -0.6067  -0.0986   0.9581   0.8792   0.8504   0.9558   0.6884  -(
##
## sigma: 0.256185
## lambda (gene 1): 1.19265
## epsilon (gene 1): 0.82833
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 564.06
## delta (gene 1): 12.0519
## s (cell 1): 1.26449
## nu (cell 1): 1.01169
## theta (batch 1): 0.0350376
## betas:    1.3633  -0.1323   0.1539  -0.3894  -0.1538   1.6063   0.6837   1.1669   0.6298   0.9604  -(
##
## sigma: 0.258001
## lambda (gene 1): 0.443326
## epsilon (gene 1): 1.02051
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 29840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 634.204
## delta (gene 1): 10.2484
## s (cell 1): 1.01273
## nu (cell 1): 1.01918
## theta (batch 1): 0.0539779
## betas:    1.2220  -0.1104  -0.0749  -0.0714   0.1754   1.0108   1.4136   0.6876   0.7990   1.1804  -1
##
## sigma: 0.255515
## lambda (gene 1): 0.627164
## epsilon (gene 1): 0.831558
```

```
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 29880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 358.431
## delta (gene 1): 11.7065
## s (cell 1): 0.880241
## nu (cell 1): 1.00745
## theta (batch 1): 0.0624812
## betas:    0.9874  -0.2309   0.0422  -0.6975  -0.0244   2.0082   0.7146   1.1489   1.6306   0.1574   (
##
## sigma: 0.252397
## lambda (gene 1): 1.0392
## epsilon (gene 1): 0.992867
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 29920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 345.535
## delta (gene 1): 10.6533
## s (cell 1): 1.52898
## nu (cell 1): 1.13773
## theta (batch 1): 0.0222553
## betas:    1.0438  -0.2643  -0.1224  -0.7423   0.3376   1.4695   1.0931   0.9185   1.5994   0.7554  -(
##
## sigma: 0.254414
## lambda (gene 1): 1.0289
## epsilon (gene 1): 0.924844
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 29960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 387.98
## delta (gene 1): 9.77481
## s (cell 1): 1.35252
## nu (cell 1): 1.1115
```

```
## theta (batch 1): 0.0261579
## betas:    0.8090  -0.1052  -0.1359  -0.3389   0.6200   1.1911   1.4543   0.6679   1.4586   0.5044  -(
##
## sigma: 0.245071
## lambda (gene 1): 0.447921
## epsilon (gene 1): 0.808428
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 30000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 446.938
## delta (gene 1): 12.7559
## s (cell 1): 1.00172
## nu (cell 1): 1.05555
## theta (batch 1): 0.0149024
## betas:    1.1145  -0.0896  -0.1615  -0.5130   0.5841   1.3622   1.0080   0.8617   0.9969   0.6836  -(
##
## sigma: 0.265189
## lambda (gene 1): 0.219636
## epsilon (gene 1): 1.1139
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 30040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 350.561
## delta (gene 1): 8.20327
## s (cell 1): 0.988485
## nu (cell 1): 1.05427
## theta (batch 1): 0.00463535
## betas:    1.0897  -0.1502  -0.2601  -0.2767  -0.0450   1.4292   1.2733   0.7656   1.1275   0.9267  -(
##
## sigma: 0.249495
## lambda (gene 1): 1.43701
## epsilon (gene 1): 0.667424
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 30080 out of 40000 has been completed.
```

```
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 867.561
## delta (gene 1): 7.24839
## s (cell 1): 0.925612
## nu (cell 1): 1.09031
## theta (batch 1): 0.0136185
## betas:    0.8159  -0.1505  -0.4457  -0.2319   0.4604   1.3618   1.3465   0.7706   1.5349   0.5078  -(
##
## sigma: 0.261799
## lambda (gene 1): 1.56881
## epsilon (gene 1): 0.554576
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 30120 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 602.334
## delta (gene 1): 13.3105
## s (cell 1): 0.927646
## nu (cell 1): 1.09702
## theta (batch 1): 0.00990238
## betas:    0.6817  -0.2713  -0.5783  -0.8817   0.4907   1.8786   0.7146   1.5079   1.4547   0.8575   (
##
## sigma: 0.246939
## lambda (gene 1): 0.489501
## epsilon (gene 1): 1.1201
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 30160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 678.93
## delta (gene 1): 8.782
## s (cell 1): 1.01924
## nu (cell 1): 1.02312
## theta (batch 1): 0.00244645
## betas:    0.6197  -0.1395   1.1810  -0.9413   0.7720   1.4396   1.2738   0.9935   1.4106   0.6516  -(
##
## sigma: 0.247631
## lambda (gene 1): 0.292913
## epsilon (gene 1): 0.706966
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 30200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 394.743
## delta (gene 1): 10.4499
## s (cell 1): 0.981005
## nu (cell 1): 1.03919
## theta (batch 1): 0.0025865
## betas:    0.8840    0.0070    0.2700   -0.2463    1.0961    0.5891    1.9743    0.0779    1.2646    0.6052   -
##
## sigma: 0.256134
## lambda (gene 1): 0.219728
## epsilon (gene 1): 0.875127
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 30240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 405.288
## delta (gene 1): 12.2647
## s (cell 1): 1.17355
## nu (cell 1): 1.10935
## theta (batch 1): 0.00288894
## betas:    1.3827   -0.2236   -0.9595    0.0410   -0.0305    1.3622    0.8858    1.0512    1.0143    0.8776   -
##
## sigma: 0.252712
## lambda (gene 1): 0.401935
## epsilon (gene 1): 1.05983
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 30280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 589.894
## delta (gene 1): 11.6778
## s (cell 1): 1.45383
## nu (cell 1): 1.064
## theta (batch 1): 0.0233544
## betas:    0.7934   -0.1155   -0.6362    0.0061    0.8923    1.3348    0.7714    1.5786    0.7428    0.8788   -
```

```
## 
## sigma: 0.266728
## lambda (gene 1): 0.369513
## epsilon (gene 1): 1.01467
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 30320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 599.314
## delta (gene 1): 9.46293
## s (cell 1): 1.13303
## nu (cell 1): 1.18728
## theta (batch 1): 0.00531706
## betas:    0.8741  -0.1626  -0.3905  -0.1042   0.6015   1.0441   1.4817   0.8185   1.3815   0.5994  -(
## 
## sigma: 0.259979
## lambda (gene 1): 1.00216
## epsilon (gene 1): 0.809382
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 30360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.481
## delta (gene 1): 14.5222
## s (cell 1): 1.17705
## nu (cell 1): 1.02941
## theta (batch 1): 0.0135433
## betas:    0.7498  -0.2273  -0.3532  -0.6891   0.8515   1.1239   1.4449   0.9442   1.4909   0.9067   (
## 
## sigma: 0.248473
## lambda (gene 1): 0.293299
## epsilon (gene 1): 1.21026
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 30400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 407.047
## delta (gene 1): 12.587
## s (cell 1): 0.939801
## nu (cell 1): 1.09976
## theta (batch 1): 0.0305028
## betas:    0.5125  -0.1251  -0.2505  -0.3577   0.8920   1.5100   1.0818   1.2130   1.3177   0.6742  -(
##
## sigma: 0.255189
## lambda (gene 1): 0.35406
## epsilon (gene 1): 1.08217
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 30440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 470.153
## delta (gene 1): 11.5934
## s (cell 1): 0.920042
## nu (cell 1): 1.01615
## theta (batch 1): 0.0881476
## betas:    0.8595  -0.1440  -0.5014  -0.0943   0.2715   1.6526   0.9482   1.2150   1.0499   0.8647  -(
##
## sigma: 0.251761
## lambda (gene 1): 0.726573
## epsilon (gene 1): 1.01127
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 30480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.545
## delta (gene 1): 9.86341
## s (cell 1): 1.00952
## nu (cell 1): 1.02839
## theta (batch 1): 0.107554
## betas:    1.2750  -0.2012   0.1881  -0.7190   0.3582   1.1614   1.1831   0.7349   1.3561   0.6033  -(
##
## sigma: 0.237188
## lambda (gene 1): 0.691628
## epsilon (gene 1): 0.873896
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 30520 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 701.674
## delta (gene 1): 10.691
## s (cell 1): 0.798393
## nu (cell 1): 1.06281
## theta (batch 1): 0.0185882
## betas:    1.5478  -0.2960   0.1160  -0.6063  -0.0614   1.0572   1.2226   0.7038   1.3283   0.9546  -(
##
## sigma: 0.255405
## lambda (gene 1): 0.610104
## epsilon (gene 1): 0.922326
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 30560 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 440.694
## delta (gene 1): 11.4295
## s (cell 1): 1.31858
## nu (cell 1): 1.04893
## theta (batch 1): 0.0366629
## betas:    0.9143  -0.3535   0.0642  -0.0971  -0.0844   1.2817   1.4277   1.0290   1.6681   1.1225   (
##
## sigma: 0.250077
## lambda (gene 1): 0.131967
## epsilon (gene 1): 0.950134
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 30600 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 683.53
## delta (gene 1): 7.14201
## s (cell 1): 1.15931
## nu (cell 1): 1.12885
## theta (batch 1): 0.0487594
## betas:    1.4569  -0.2131   0.1997  -0.5828   0.2380   1.1899   1.0592   0.7863   1.1707   0.7573  -(
##
## sigma: 0.254353
```

```
## lambda (gene 1): 1.45716
## epsilon (gene 1): 0.506652
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 30640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 429.242
## delta (gene 1): 8.94982
## s (cell 1): 0.744032
## nu (cell 1): 1.03868
## theta (batch 1): 0.174612
## betas:    1.6572  -0.3624  -0.0148  -0.5717  -0.3084   1.3205   0.7161   1.2450   1.0268   1.2428  -(
##
## sigma: 0.251472
## lambda (gene 1): 0.194371
## epsilon (gene 1): 0.753971
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 30680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 306.261
## delta (gene 1): 9.66381
## s (cell 1): 1.79103
## nu (cell 1): 1.1309
## theta (batch 1): 0.103258
## betas:    1.4700  -0.2423   0.1895   0.1257  -0.6033   1.0034   1.5279   0.5819   1.1125   1.1692  -(
##
## sigma: 0.252957
## lambda (gene 1): 0.324346
## epsilon (gene 1): 0.795994
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 30720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 455.736
## delta (gene 1): 10.5516
```

```
## s (cell 1): 0.989806
## nu (cell 1): 1.05678
## theta (batch 1): 0.010526
## betas:    1.6941  -0.2496   0.1667  -0.1221  -0.2691   1.1419   0.9935   0.7007   1.3541   0.3202   (
##
## sigma: 0.261385
## lambda (gene 1): 0.582652
## epsilon (gene 1): 0.881746
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 30760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 658.857
## delta (gene 1): 8.56425
## s (cell 1): 0.923882
## nu (cell 1): 1.03223
## theta (batch 1): 0.0152694
## betas:    1.1744e+00  -2.3620e-01   3.4221e-05   7.4808e-01  -7.7732e-01   1.5765e+00   1.3848e+00
##
## sigma: 0.251509
## lambda (gene 1): 0.642285
## epsilon (gene 1): 0.651658
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 30800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.296
## delta (gene 1): 14.4302
## s (cell 1): 0.967911
## nu (cell 1): 1.07761
## theta (batch 1): 0.0283037
## betas:    1.6147  -0.2801   0.4973  -0.8190  -0.1123   1.3001   0.8760   0.9565   1.0311   1.0584  -(
##
## sigma: 0.239078
## lambda (gene 1): 0.568521
## epsilon (gene 1): 1.21436
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## -------------------------------------------------------
## Iteration 30840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 301.203
## delta (gene 1): 8.46977
## s (cell 1): 1.31117
## nu (cell 1): 1.04075
## theta (batch 1): 0.0246966
## betas:    1.4809  -0.2176   0.6591  -0.6751   0.0635   1.2290   1.1537   0.6871   1.1463   0.8717  -(
##
## sigma: 0.261664
## lambda (gene 1): 0.580333
## epsilon (gene 1): 0.69759
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 30880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 687.901
## delta (gene 1): 12.8427
## s (cell 1): 1.13163
## nu (cell 1): 1.00909
## theta (batch 1): 0.0206051
## betas:    0.7433  -0.3153   1.1456   0.1281  -0.7009   1.6574   1.4923   0.8511   1.8171   1.0990   (
##
## sigma: 0.250504
## lambda (gene 1): 0.315368
## epsilon (gene 1): 1.10123
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 30920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 420.613
## delta (gene 1): 8.60649
## s (cell 1): 1.23905
## nu (cell 1): 1.18626
## theta (batch 1): 0.00830598
## betas:    1.3274  -0.1855   0.6226   0.0873  -0.7186   1.5378   1.2949   0.3095   1.7315   0.2399  -(
##
## sigma: 0.25819
## lambda (gene 1): 1.0915
## epsilon (gene 1): 0.700238
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 30960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.843
## delta (gene 1): 11.4255
## s (cell 1): 1.09901
## nu (cell 1): 1.05419
## theta (batch 1): 0.0193803
## betas:    1.3340  -0.2656   0.7209  -0.9620   0.0361   1.0866   1.5040   0.5793   1.4362   0.7859  -(
##
## sigma: 0.250305
## lambda (gene 1): 0.879542
## epsilon (gene 1): 0.926595
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 31000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 426.53
## delta (gene 1): 10.3196
## s (cell 1): 1.05861
## nu (cell 1): 1.06561
## theta (batch 1): 0.0365167
## betas:    0.9021  -0.1996   0.7137  -0.1737   0.1310   1.3782   1.2729   0.8794   1.5057   0.6024   (
##
## sigma: 0.254995
## lambda (gene 1): 0.598986
## epsilon (gene 1): 0.892387
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 31040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 279.674
## delta (gene 1): 13.4124
## s (cell 1): 1.26343
## nu (cell 1): 1.10276
```

```
## theta (batch 1): 0.00835158
## betas:    1.3762  -0.0848  -0.6597  -0.1951   0.7975   1.0116   1.0311   0.6846   1.0537   0.3315  -(
##
## sigma: 0.241687
## lambda (gene 1): 0.758507
## epsilon (gene 1): 1.15484
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 31080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 273.342
## delta (gene 1): 10.187
## s (cell 1): 1.10761
## nu (cell 1): 1.10448
## theta (batch 1): 0.00704997
## betas:    1.1976  -0.3016  -0.5574  -0.8143  -0.0198   1.4290   1.3502   0.3984   2.3274  -0.0843   (
##
## sigma: 0.249393
## lambda (gene 1): 0.507108
## epsilon (gene 1): 0.877611
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 31120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 595.183
## delta (gene 1): 9.19183
## s (cell 1): 0.998203
## nu (cell 1): 1.03756
## theta (batch 1): 0.00316899
## betas:    0.6576  -0.1023  -0.1677  -0.1942   0.5524   1.7234   0.9249   1.0753   1.3112   0.6099  -(
##
## sigma: 0.26257
## lambda (gene 1): 0.723793
## epsilon (gene 1): 0.799794
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 31160 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 347.863
## delta (gene 1): 10.7414
## s (cell 1): 1.12131
## nu (cell 1): 1.13464
## theta (batch 1): 0.00279683
## betas:    1.5316  -0.1572  -0.9829  -0.1276   0.2251   0.8556   1.2729   0.6422   0.9782   0.7177  -(
##
## sigma: 0.269386
## lambda (gene 1): 1.57799
## epsilon (gene 1): 0.918032
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 31200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 367.384
## delta (gene 1): 12.0079
## s (cell 1): 1.03398
## nu (cell 1): 1.08014
## theta (batch 1): 0.00272166
## betas:    0.4153  -0.0897  -0.1167   0.2072   0.4897   1.3230   1.6630   0.7076   1.4820   0.8163  -(
##
## sigma: 0.258669
## lambda (gene 1): 0.402495
## epsilon (gene 1): 1.02588
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 31240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 562.255
## delta (gene 1): 9.75693
## s (cell 1): 1.20386
## nu (cell 1): 1.18051
## theta (batch 1): 0.00661612
## betas:    0.7766  -0.1557   0.2162  -0.7695   0.4721   1.4915   1.2343   0.9607   1.3001   0.8697  -(
##
## sigma: 0.248425
## lambda (gene 1): 0.357345
## epsilon (gene 1): 0.814253
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 559.104
## delta (gene 1): 8.32432
## s (cell 1): 1.08134
## nu (cell 1): 1.06116
## theta (batch 1): 0.00481102
## betas:     0.4019  -0.0887  -0.4899   0.4684   0.4201   1.7525   1.1636   1.0779   1.2517   0.8253  -(
##
## sigma: 0.260932
## lambda (gene 1): 0.881009
## epsilon (gene 1): 0.671468
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 490.252
## delta (gene 1): 12.0003
## s (cell 1): 1.06089
## nu (cell 1): 1.03038
## theta (batch 1): 0.0052946
## betas:     0.8123  -0.0075   0.2698  -0.2238   0.5444   1.3381   1.2472   0.7871   1.0138   0.4797  -(
##
## sigma: 0.248
## lambda (gene 1): 0.351981
## epsilon (gene 1): 1.04455
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 587.862
## delta (gene 1): 6.64608
## s (cell 1): 1.03391
## nu (cell 1): 1.02442
## theta (batch 1): 0.0139531
## betas:     2.3356  -0.2274  -0.5055  -0.6866  -0.1290   0.6496   0.9703   0.3754   1.0623   0.3763  -(
```

```
## 
## sigma: 0.247662
## lambda (gene 1): 0.858972
## epsilon (gene 1): 0.480164
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 681.94
## delta (gene 1): 6.34985
## s (cell 1): 1.14967
## nu (cell 1): 1.01309
## theta (batch 1): 0.0219625
## betas:    1.6171  -0.2616   0.1036  -0.3000  -0.1116   0.9286   1.1765   0.5895   1.3040   0.8986  -(
## 
## sigma: 0.25064
## lambda (gene 1): 0.96508
## epsilon (gene 1): 0.396015
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 728.246
## delta (gene 1): 7.666
## s (cell 1): 0.927803
## nu (cell 1): 1.07212
## theta (batch 1): 0.012122
## betas:    1.8479  -0.2867  -0.0270  -0.7825  -0.1688   0.9634   0.9342   0.9175   0.8190   1.2149  -(
## 
## sigma: 0.252191
## lambda (gene 1): 0.59507
## epsilon (gene 1): 0.56069
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 412.033
## delta (gene 1): 9.01792
## s (cell 1): 1.05915
## nu (cell 1): 1.06088
## theta (batch 1): 0.00405683
## betas:    1.4211  -0.2207  -0.0693  -0.3971  -0.0732   1.2117   1.2392   0.5196   1.4753   0.5552  -(
##
## sigma: 0.249299
## lambda (gene 1): 0.350074
## epsilon (gene 1): 0.767705
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 31520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 684.586
## delta (gene 1): 11.1521
## s (cell 1): 1.0381
## nu (cell 1): 1.06387
## theta (batch 1): 0.00190361
## betas:    1.6831  -0.2684  -0.5917  -1.0879   0.1979   1.2586   0.8982   0.7866   1.1062   1.0701  -(
##
## sigma: 0.24094
## lambda (gene 1): 0.810155
## epsilon (gene 1): 1.0075
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 31560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 767.848
## delta (gene 1): 11.5888
## s (cell 1): 1.14552
## nu (cell 1): 1.02658
## theta (batch 1): 0.00396477
## betas:    1.0414  -0.0670   0.4783  -0.4386   0.3158   1.5208   1.1095   0.6278   1.2380   0.5660  -1
##
## sigma: 0.242707
## lambda (gene 1): 0.984403
## epsilon (gene 1): 1.05323
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 31600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 390.313
## delta (gene 1): 6.81513
## s (cell 1): 1.03098
## nu (cell 1): 1.02958
## theta (batch 1): 0.000527752
## betas:    0.8424  -0.2309  -0.7186  -0.8854   0.7532   1.6512   0.8383   1.1790   1.4453   0.9271  -(
##
## sigma: 0.247517
## lambda (gene 1): 1.08698
## epsilon (gene 1): 0.48117
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 31640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 728.593
## delta (gene 1): 11.811
## s (cell 1): 1.06238
## nu (cell 1): 1.09842
## theta (batch 1): 0.00122924
## betas:    1.1680  -0.1402  -0.5205  -0.5808   0.4444   1.6005   0.9445   0.6475   1.3922   0.5874  -(
##
## sigma: 0.245741
## lambda (gene 1): 0.6949
## epsilon (gene 1): 1.05014
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 31680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 539.658
## delta (gene 1): 8.62662
## s (cell 1): 1.10401
## nu (cell 1): 1.06687
## theta (batch 1): 0.00201142
## betas:    0.9520  -0.1592  -0.5339  -0.5288   0.5625   1.3947   1.1521   0.9744   1.0930   0.9524  -(
##
## sigma: 0.245174
```

```
## lambda (gene 1): 1.42588
## epsilon (gene 1): 0.702856
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 230.69
## delta (gene 1): 17.1221
## s (cell 1): 0.990369
## nu (cell 1): 1.07431
## theta (batch 1): 0.00159475
## betas:    1.0927  -0.2212  -0.4005  -0.4723   0.2125   1.5765   0.8702   1.0605   1.4889   0.3701   (
##
## sigma: 0.271064
## lambda (gene 1): 0.951411
## epsilon (gene 1): 1.43435
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1191.18
## delta (gene 1): 11.7547
## s (cell 1): 1.08934
## nu (cell 1): 1.07535
## theta (batch 1): 0.000229497
## betas:    0.9572  -0.0259   0.4482  -0.0177   0.3574   1.1233   1.6318   0.1351   1.6047   0.1161  -(
##
## sigma: 0.248301
## lambda (gene 1): 0.573268
## epsilon (gene 1): 1.02041
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 373.264
## delta (gene 1): 11.3694
```

```
## s (cell 1): 1.06949
## nu (cell 1): 1.10096
## theta (batch 1): 0.00112926
## betas:    0.8255  -0.3168   0.1850  -0.7739   0.0500   1.9073   0.9523   1.2373   1.5493   1.2037   (
##
## sigma: 0.241989
## lambda (gene 1): 1.06222
## epsilon (gene 1): 0.982171
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -----------------------------------------------------
## Iteration 31840 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 576.456
## delta (gene 1): 8.72823
## s (cell 1): 1.13774
## nu (cell 1): 1.05046
## theta (batch 1): 0.0047452
## betas:    1.4837  -0.2536   0.2912  -0.6062  -0.0840   1.1185   1.2339   0.5965   1.4781   0.6445   -(
##
## sigma: 0.253768
## lambda (gene 1): 0.661252
## epsilon (gene 1): 0.718845
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -----------------------------------------------------
## Iteration 31880 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.774
## delta (gene 1): 12.2025
## s (cell 1): 1.25119
## nu (cell 1): 1.07453
## theta (batch 1): 0.0273353
## betas:    1.3234  -0.1798   0.2136  -0.7412   0.3767   1.2083   1.0039   0.9301   1.1054   0.7191   -(
##
## sigma: 0.25986
## lambda (gene 1): 0.205022
## epsilon (gene 1): 1.04935
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ---------------------------------------------------------
## Iteration 31920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1242.97
## delta (gene 1): 11.9251
## s (cell 1): 0.769637
## nu (cell 1): 1.09854
## theta (batch 1): 0.0541094
## betas:    1.4283  -0.2284   0.4723  -0.2849   0.1204   0.7453   1.5109   0.5915   1.2632   0.8394  -(
##
## sigma: 0.241895
## lambda (gene 1): 0.265478
## epsilon (gene 1): 1.0155
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 31960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 281.332
## delta (gene 1): 10.1277
## s (cell 1): 1.03044
## nu (cell 1): 0.997117
## theta (batch 1): 0.0254212
## betas:    1.5024  -0.3123   0.2584  -0.3136  -0.9668   2.0381   0.5120   1.1698   1.2791   0.8006  -(
##
## sigma: 0.257391
## lambda (gene 1): 1.49935
## epsilon (gene 1): 0.876097
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 32000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 635.035
## delta (gene 1): 9.11797
## s (cell 1): 1.00303
## nu (cell 1): 1.09871
## theta (batch 1): 0.0442249
## betas:    1.2731  -0.2653   0.3132  -0.3200  -0.2060   1.3462   1.2737   0.6397   1.6730   0.5057   (
##
## sigma: 0.256308
## lambda (gene 1): 2.46792
## epsilon (gene 1): 0.756103
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.526
## delta (gene 1): 9.45062
## s (cell 1): 0.829888
## nu (cell 1): 1.05432
## theta (batch 1): 0.0278155
## betas:    1.4032  -0.1141  -0.9549  -0.0670   0.7194   0.9239   1.1720   0.5480   1.1475   0.4743  -(
##
## sigma: 0.259747
## lambda (gene 1): 0.104392
## epsilon (gene 1): 0.821498
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 334.808
## delta (gene 1): 8.58338
## s (cell 1): 0.957353
## nu (cell 1): 1.03079
## theta (batch 1): 0.0124093
## betas:    0.8496  -0.2269  -0.7483   0.1561   0.2326   1.3621   1.3240   0.9281   1.4667   0.9275  -(
##
## sigma: 0.252969
## lambda (gene 1): 0.35792
## epsilon (gene 1): 0.684266
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 435.8
## delta (gene 1): 10.6445
## s (cell 1): 1.21822
## nu (cell 1): 1.13717
```

```
## theta (batch 1): 0.0243195
## betas:    0.4551  -0.1026   0.2641   0.0242   0.6369   1.1756   1.6227   0.8823   1.4099   0.5854  (
##
## sigma: 0.256704
## lambda (gene 1): 0.165491
## epsilon (gene 1): 0.901471
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 476.019
## delta (gene 1): 10.2263
## s (cell 1): 1.15607
## nu (cell 1): 1.07941
## theta (batch 1): 0.118451
## betas:    0.9990  -0.1956   0.0712  -0.4162   0.5421   0.9618   1.7479   0.4391   1.6281   0.6677  -(
##
## sigma: 0.248649
## lambda (gene 1): 0.936724
## epsilon (gene 1): 0.871524
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 268.705
## delta (gene 1): 7.31399
## s (cell 1): 1.41828
## nu (cell 1): 1.00403
## theta (batch 1): 0.0381853
## betas:    1.0282  -0.2541  -0.5111  -0.3868   0.4649   1.1303   1.0846   1.2757   1.1051   1.1090  -(
##
## sigma: 0.250223
## lambda (gene 1): 1.99801
## epsilon (gene 1): 0.514943
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32240 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 842.789
## delta (gene 1): 9.84655
## s (cell 1): 1.25451
## nu (cell 1): 1.09548
## theta (batch 1): 0.0363404
## betas:    1.5372  -0.1378   0.8748  -0.2640  -0.5689   1.2457   1.3917   0.2035   1.3326   0.5131  -0
##
## sigma: 0.259841
## lambda (gene 1): 1.41821
## epsilon (gene 1): 0.826587
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 479.199
## delta (gene 1): 8.97184
## s (cell 1): 0.987352
## nu (cell 1): 1.0562
## theta (batch 1): 0.0121857
## betas:    1.6105  -0.2590  -0.2959  -0.1399  -0.1004   0.9494   1.3139   0.3639   1.7157   0.2795
##
## sigma: 0.26809
## lambda (gene 1): 1.45281
## epsilon (gene 1): 0.77893
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 463.179
## delta (gene 1): 11.2494
## s (cell 1): 0.970093
## nu (cell 1): 1.07022
## theta (batch 1): 0.00888133
## betas:    1.2083e+00  -3.3021e-01   4.6644e-05  -1.4132e-01  -2.9075e-02   1.1349e+00   1.2527e+00
##
## sigma: 0.254793
## lambda (gene 1): 0.539301
## epsilon (gene 1): 0.936627
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 32360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 432.483
## delta (gene 1): 9.13244
## s (cell 1): 0.83732
## nu (cell 1): 1.06694
## theta (batch 1): 0.0283968
## betas:    1.7275  -0.2450   0.2442  -0.2241  -0.3474   0.9466   1.0451   0.8950   0.7822   1.0671  -(
##
## sigma: 0.259578
## lambda (gene 1): 1.39562
## epsilon (gene 1): 0.739402
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 32400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 527.171
## delta (gene 1): 10.9245
## s (cell 1): 0.950416
## nu (cell 1): 1.01164
## theta (batch 1): 0.0253335
## betas:    0.9108  -0.2097   0.6724  -0.2366   0.5954   0.6694   1.7203   0.7763   1.3566   0.8515   (
##
## sigma: 0.241438
## lambda (gene 1): 0.27798
## epsilon (gene 1): 0.921706
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 32440 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 601.898
## delta (gene 1): 6.65262
## s (cell 1): 1.19734
## nu (cell 1): 1.04913
## theta (batch 1): 0.035343
## betas:    2.3518  -0.3021   0.6321  -0.7882  -0.7294   0.9457   0.8973   0.6566   0.6611   1.2518  -1
```

```
##
## sigma: 0.250577
## lambda (gene 1): 1.04793
## epsilon (gene 1): 0.453487
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 32480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.542
## delta (gene 1): 11.2443
## s (cell 1): 0.799032
## nu (cell 1): 1.00942
## theta (batch 1): 0.0157759
## betas:    2.2487  -0.3302   0.6967  -0.8005  -0.3208   1.0154   0.6061   0.8665   1.0239   0.8153  -(
##
## sigma: 0.244906
## lambda (gene 1): 0.593558
## epsilon (gene 1): 0.972434
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 32520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 687.448
## delta (gene 1): 9.99321
## s (cell 1): 0.929029
## nu (cell 1): 1.15254
## theta (batch 1): 0.205866
## betas:    1.8971  -0.2882   0.5257  -0.3365  -0.6744   1.2172   1.0343   0.5064   1.4202   0.5118  -(
##
## sigma: 0.253159
## lambda (gene 1): 1.08225
## epsilon (gene 1): 0.868571
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 32560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 375.333
## delta (gene 1): 16.1854
## s (cell 1): 1.28776
## nu (cell 1): 1.1075
## theta (batch 1): 0.0503889
## betas:    1.8988  -0.2544   0.3596  -0.5853  -0.0914   0.7704   1.0821   0.7280   0.8614   1.0819  -0
##
## sigma: 0.250766
## lambda (gene 1): 0.299369
## epsilon (gene 1): 1.32536
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 32600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 425.384
## delta (gene 1): 8.64237
## s (cell 1): 0.997439
## nu (cell 1): 0.995476
## theta (batch 1): 0.0546061
## betas:    1.4144  -0.2378   0.3589  -0.6081   0.3531   1.2714   1.0688   0.6404   1.5051   0.5582  -0
##
## sigma: 0.24185
## lambda (gene 1): 0.850085
## epsilon (gene 1): 0.702176
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 32640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.215
## delta (gene 1): 11.8258
## s (cell 1): 1.07345
## nu (cell 1): 1.08236
## theta (batch 1): 0.0451325
## betas:    1.1966  -0.1919   0.4885  -0.4962   0.0462   1.1061   1.4244   0.6061   1.4364   0.5591  -0
##
## sigma: 0.257965
## lambda (gene 1): 0.232898
## epsilon (gene 1): 1.01986
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 633.017
## delta (gene 1): 10.0088
## s (cell 1): 1.42712
## nu (cell 1): 1.11005
## theta (batch 1): 0.0346198
## betas:    1.2242  -0.1055   0.4776  -0.2497  -0.1386   1.7333   0.6811   0.9817   1.0704   0.3746  -(
##
## sigma: 0.247062
## lambda (gene 1): 1.56853
## epsilon (gene 1): 0.869972
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 451.241
## delta (gene 1): 11.334
## s (cell 1): 1.5801
## nu (cell 1): 1.09104
## theta (batch 1): 0.106073
## betas:    1.5865  -0.1190   0.1577  -0.9720   0.4227   1.2844   0.8810   0.5661   1.1623   0.3321  -(
##
## sigma: 0.260679
## lambda (gene 1): 0.734595
## epsilon (gene 1): 1.03599
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 32760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 357.172
## delta (gene 1): 8.65116
## s (cell 1): 0.759305
## nu (cell 1): 1.08966
## theta (batch 1): 0.0527989
## betas:    1.5705  -0.2489  -0.7132  -0.8529   0.0378   1.4329   0.6333   1.0722   1.1533   0.4982   (
##
## sigma: 0.256058
```

```
## lambda (gene 1): 1.35862
## epsilon (gene 1): 0.682575
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 32800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 402.131
## delta (gene 1): 14.3564
## s (cell 1): 1.05386
## nu (cell 1): 1.05652
## theta (batch 1): 0.0159745
## betas:    0.9422  -0.1361  -0.2702  -0.4955   0.8388   1.1908   1.3187   0.6388   1.5027   0.4498  -
##
## sigma: 0.250004
## lambda (gene 1): 0.314154
## epsilon (gene 1): 1.23071
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 32840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 682.646
## delta (gene 1): 9.73795
## s (cell 1): 1.03844
## nu (cell 1): 1.03895
## theta (batch 1): 0.00477231
## betas:    1.3927  -0.1675  -0.1238  -0.2592  -0.0083   1.1944   1.3476   0.4290   1.3080   0.7335  -
##
## sigma: 0.250814
## lambda (gene 1): 0.650728
## epsilon (gene 1): 0.851377
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 32880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 415.185
## delta (gene 1): 9.23393
```

```
## s (cell 1): 1.18081
## nu (cell 1): 1.0007
## theta (batch 1): 0.0136345
## betas:    1.9604  -0.2868   0.1274  -0.7011  -0.6166   1.4372   0.7199   0.7237   1.1779   0.7090  -(
##
## sigma: 0.25066
## lambda (gene 1): 1.91821
## epsilon (gene 1): 0.784479
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 32920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 666.576
## delta (gene 1): 11.5649
## s (cell 1): 1.07597
## nu (cell 1): 1.0645
## theta (batch 1): 0.0543437
## betas:    1.3155  -0.3586   0.0986  -0.6667   0.2203   0.7443   1.6635   0.7299   1.3507   1.6020  -(
##
## sigma: 0.246924
## lambda (gene 1): 0.0844785
## epsilon (gene 1): 0.99702
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 32960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 777.937
## delta (gene 1): 9.95651
## s (cell 1): 1.51792
## nu (cell 1): 1.04356
## theta (batch 1): 0.0430355
## betas:    1.2977  -0.2682  -0.3310  -0.0022  -0.0896   0.9187   1.6227   0.4483   1.6880   0.6773  -(
##
## sigma: 0.235563
## lambda (gene 1): 1.72883
## epsilon (gene 1): 0.855933
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ---------------------------------------------------------
## Iteration 33000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 709.585
## delta (gene 1): 7.92977
## s (cell 1): 1.03581
## nu (cell 1): 1.06605
## theta (batch 1): 0.00278299
## betas:    1.3153  -0.2400   0.1804  -0.1843   0.1646   0.7335   1.7372   0.2940   1.6100   0.8018  -(
##
## sigma: 0.25518
## lambda (gene 1): 0.567141
## epsilon (gene 1): 0.585661
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 33040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 690.92
## delta (gene 1): 10.2953
## s (cell 1): 1.06727
## nu (cell 1): 1.07884
## theta (batch 1): 0.00207993
## betas:    0.6026  -0.2281   0.6942  -0.4992   0.4526   1.4676   1.3813   0.9658   1.6672   0.9148  -(
##
## sigma: 0.256224
## lambda (gene 1): 1.24644
## epsilon (gene 1): 0.91806
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 33080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 411.09
## delta (gene 1): 8.09052
## s (cell 1): 1.13643
## nu (cell 1): 1.02881
## theta (batch 1): 0.0079242
## betas:    1.7218  -0.2559  -0.1103  -1.0871   0.0158   1.4137   0.4942   1.2326   0.7862   1.0094  -(
##
## sigma: 0.24542
## lambda (gene 1): 1.32491
## epsilon (gene 1): 0.636268
```

```
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 33120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 338.743
## delta (gene 1): 8.39777
## s (cell 1): 1.00844
## nu (cell 1): 1.05685
## theta (batch 1): 0.0149417
## betas:    1.4780  -0.1672   0.0563  -0.9812   0.4187   0.9301   1.0298   0.9251   0.8865   0.7182  -(
##
## sigma: 0.259911
## lambda (gene 1): 0.232352
## epsilon (gene 1): 0.66357
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 33160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 714.763
## delta (gene 1): 7.79907
## s (cell 1): 1.02937
## nu (cell 1): 1.01668
## theta (batch 1): 0.0109335
## betas:    0.7312  -0.0726  -0.2000   0.3907   0.3267   0.9732   1.7973   0.5950   1.1028   0.9900  -(
##
## sigma: 0.266689
## lambda (gene 1): 0.856605
## epsilon (gene 1): 0.586123
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 33200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 366.387
## delta (gene 1): 9.30198
## s (cell 1): 1.10234
## nu (cell 1): 1.05937
```

```
## theta (batch 1): 0.021339
## betas:    0.8811  -0.0693    0.1643  -0.2380    0.2618    1.6143    0.9752    0.8864    1.1991    0.4125  -(
##
## sigma: 0.245848
## lambda (gene 1): 0.783358
## epsilon (gene 1): 0.774313
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -----------------------------------------------------------
## Iteration 33240 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.224
## delta (gene 1): 12.4365
## s (cell 1): 1.11809
## nu (cell 1): 0.974964
## theta (batch 1): 0.0224515
## betas:    0.8415  -0.2085    0.0212    0.5185  -0.3036    1.7042    1.0104    1.3539    0.9684    1.1717  -(
##
## sigma: 0.254825
## lambda (gene 1): 0.34489
## epsilon (gene 1): 1.04413
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -----------------------------------------------------------
## Iteration 33280 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 302.414
## delta (gene 1): 13.0228
## s (cell 1): 1.0445
## nu (cell 1): 1.04719
## theta (batch 1): 0.0612616
## betas:    0.6438  -0.0775    0.8488    0.7370  -0.5052    1.9130    1.1714    0.8216    1.3335    0.6113  -(
##
## sigma: 0.265739
## lambda (gene 1): 0.410431
## epsilon (gene 1): 1.12829
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -----------------------------------------------------------
## Iteration 33320 out of 40000 has been completed.
```

```
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 686.761
## delta (gene 1): 10.8209
## s (cell 1): 0.947854
## nu (cell 1): 1.03704
## theta (batch 1): 0.048584
## betas:    1.1886  -0.1388  -0.2206  -0.2498  -0.0310   1.2103   1.2913   0.6841   1.0557   1.0841  -
##
## sigma: 0.235069
## lambda (gene 1): 0.91866
## epsilon (gene 1): 0.980853
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 33360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 298.823
## delta (gene 1): 10.4454
## s (cell 1): 0.974766
## nu (cell 1): 1.12896
## theta (batch 1): 0.0394377
## betas:    0.6920  -0.1911   0.0064  -0.1778   0.6244   1.0927   1.5568   0.7712   1.6228   0.7281  -0
##
## sigma: 0.248142
## lambda (gene 1): 1.60764
## epsilon (gene 1): 0.905428
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 33400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 556.073
## delta (gene 1): 9.99533
## s (cell 1): 0.665058
## nu (cell 1): 1.05688
## theta (batch 1): 0.0786563
## betas:    0.5142  -0.1224   0.0015  -0.8315   1.0690   1.4898   1.3088   0.9098   1.5297   0.6200  -0
##
## sigma: 0.263719
## lambda (gene 1): 0.70288
## epsilon (gene 1): 0.868884
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 33440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 379.244
## delta (gene 1): 6.78414
## s (cell 1): 1.25422
## nu (cell 1): 1.07747
## theta (batch 1): 0.0317989
## betas:    0.5867  -0.1127  -0.4894  -0.0594   0.9659   1.3445   1.3077   0.9263   1.4739   0.4622   (
##
## sigma: 0.246242
## lambda (gene 1): 0.769849
## epsilon (gene 1): 0.494329
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 33480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 492.647
## delta (gene 1): 14.1657
## s (cell 1): 0.94332
## nu (cell 1): 1.05584
## theta (batch 1): 0.01731
## betas:    0.6484  -0.0907  -0.6831  -0.1821   0.4880   1.7570   0.9379   1.2443   0.9701   0.9040  -(
##
## sigma: 0.243532
## lambda (gene 1): 0.782195
## epsilon (gene 1): 1.18904
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 33520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 462.102
## delta (gene 1): 10.9307
## s (cell 1): 1.09713
## nu (cell 1): 1.111
## theta (batch 1): 0.00765113
## betas:    0.7984  -0.2265  -0.5673   0.0664   0.4516   1.1006   1.6966   0.5372   1.9515   0.5201   (
```

```
## 
## sigma: 0.238011
## lambda (gene 1): 0.511076
## epsilon (gene 1): 0.950348
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 33560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 339.261
## delta (gene 1): 9.06506
## s (cell 1): 1.04453
## nu (cell 1): 1.07112
## theta (batch 1): 0.0241768
## betas:    1.7051  -0.2831  -0.1086  -0.4219  -0.6401   1.3215   1.0678   0.6474   1.3143   0.7902  -(
## 
## sigma: 0.264761
## lambda (gene 1): 0.892835
## epsilon (gene 1): 0.750173
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 33600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 286.888
## delta (gene 1): 9.83169
## s (cell 1): 0.989797
## nu (cell 1): 1.05136
## theta (batch 1): 0.0363615
## betas:    1.2152  -0.2029   0.3180   0.0080  -0.3147   1.3835   1.3619   0.4895   1.5915   0.4947  -(
## 
## sigma: 0.253296
## lambda (gene 1): 1.2447
## epsilon (gene 1): 0.851513
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 33640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 509.508
## delta (gene 1): 9.40821
## s (cell 1): 1.07034
## nu (cell 1): 1.0342
## theta (batch 1): 0.0232173
## betas:    1.2968  -0.2638  -0.2967  -0.1604   0.1741   0.8912   1.2475   0.8969   1.3218   0.9322  -(
##
## sigma: 0.252327
## lambda (gene 1): 0.43068
## epsilon (gene 1): 0.802702
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 33680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 390.917
## delta (gene 1): 10.0524
## s (cell 1): 1.04792
## nu (cell 1): 1.05552
## theta (batch 1): 0.00555281
## betas:    1.2760  -0.0965   1.4186  -0.2437  -0.6373   1.6434   1.1583   0.4531   1.3539   0.2879  -(
##
## sigma: 0.251115
## lambda (gene 1): 1.42913
## epsilon (gene 1): 0.891699
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 33720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 247.238
## delta (gene 1): 10.128
## s (cell 1): 1.05506
## nu (cell 1): 1.042
## theta (batch 1): 0.00245998
## betas:    1.6310  -0.2422  -0.2578  -0.8295   0.4185   0.9725   1.2295   0.4562   1.5339   0.3299  -(
##
## sigma: 0.248513
## lambda (gene 1): 0.126166
## epsilon (gene 1): 0.876897
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 33760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 512.745
## delta (gene 1): 10.0665
## s (cell 1): 1.04527
## nu (cell 1): 1.07171
## theta (batch 1): 0.0040026
## betas:    0.8988  -0.1638   0.5125   0.1157  -0.4919   2.0923   0.8583   0.8890   1.4674   0.6279  -(
##
## sigma: 0.242291
## lambda (gene 1): 0.533161
## epsilon (gene 1): 0.85185
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 33800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 393.209
## delta (gene 1): 9.93059
## s (cell 1): 1.03255
## nu (cell 1): 1.02127
## theta (batch 1): 0.0180133
## betas:    1.1865  -0.3007   0.2339  -0.4745   0.1716   0.9429   1.5242   0.6835   1.6845   0.8178  -(
##
## sigma: 0.254106
## lambda (gene 1): 1.00704
## epsilon (gene 1): 0.83457
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 33840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.764
## delta (gene 1): 8.8433
## s (cell 1): 1.80082
## nu (cell 1): 1.11314
## theta (batch 1): 0.0408978
## betas:    1.5875  -0.1414  -0.5792   0.1977  -0.1012   0.9898   1.2155   0.4726   1.2446   0.2120  -(
##
## sigma: 0.258472
```

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## lambda (gene 1): 0.82024
## epsilon (gene 1): 0.717611
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 33880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 621.284
## delta (gene 1): 8.63869
## s (cell 1): 1.20674
## nu (cell 1): 1.04931
## theta (batch 1): 0.013863
## betas:    1.3797  -0.1324   0.1145  -0.4872   0.4149   0.5320   1.8192   0.0471   1.5051   0.5437  -(
##
## sigma: 0.251423
## lambda (gene 1): 0.807434
## epsilon (gene 1): 0.728281
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 33920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 767.156
## delta (gene 1): 16.6495
## s (cell 1): 0.9954
## nu (cell 1): 1.02555
## theta (batch 1): 0.0247767
## betas:    1.0401  -0.1242   0.4466  -0.1254   0.2199   1.0689   1.6415   0.3637   1.5629   0.3698  -(
##
## sigma: 0.250925
## lambda (gene 1): 0.905616
## epsilon (gene 1): 1.39308
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 33960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 589.273
## delta (gene 1): 10.2751
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## s (cell 1): 1.72971
## nu (cell 1): 1.06943
## theta (batch 1): 0.0545242
## betas:    1.2850  -0.2803  -0.2596  -0.2908  -0.2745   1.3622   1.0277   1.0598   1.2471   0.9206
##
## sigma: 0.249613
## lambda (gene 1): 1.12451
## epsilon (gene 1): 0.857561
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 34000 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 608.387
## delta (gene 1): 9.19177
## s (cell 1): 0.970029
## nu (cell 1): 1.01107
## theta (batch 1): 0.0300417
## betas:    1.3522  -0.1818  -0.4938   0.2269  -0.2210   1.1269   1.5153   0.2411   1.6515   0.4864
##
## sigma: 0.253905
## lambda (gene 1): 1.35076
## epsilon (gene 1): 0.763965
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 34040 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 520.915
## delta (gene 1): 9.37145
## s (cell 1): 0.911992
## nu (cell 1): 1.0867
## theta (batch 1): 0.0167215
## betas:    0.9987  -0.1859  -0.2371  -0.4660   0.0483   1.9554   0.8753   0.8150   1.5347   0.4789
##
## sigma: 0.247166
## lambda (gene 1): 0.409138
## epsilon (gene 1): 0.800892
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## --------------------------------------------------------
## Iteration 34080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 548.048
## delta (gene 1): 17.2921
## s (cell 1): 0.707815
## nu (cell 1): 1.02139
## theta (batch 1): 0.0280037
## betas:    0.8539  -0.1531  -0.0979   0.0754  -0.1508   1.7909   0.9309   1.1402   1.1381   0.8306  -(
##
## sigma: 0.250152
## lambda (gene 1): 0.755257
## epsilon (gene 1): 1.42354
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 34120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.062
## delta (gene 1): 9.80926
## s (cell 1): 1.12176
## nu (cell 1): 1.039
## theta (batch 1): 0.0108096
## betas:    1.1576  -0.1666  -0.2554  -0.2370   0.2429   1.1218   1.3270   0.6075   1.5754   0.1837   (
##
## sigma: 0.252978
## lambda (gene 1): 0.729609
## epsilon (gene 1): 0.857874
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 34160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 541.003
## delta (gene 1): 16.209
## s (cell 1): 1.03124
## nu (cell 1): 1.08466
## theta (batch 1): 0.00541192
## betas:    1.1284  -0.2017   0.1988  -0.4743  -0.0809   1.5244   0.9307   0.9798   1.3823   0.4888   (
##
## sigma: 0.255034
## lambda (gene 1): 0.577122
## epsilon (gene 1): 1.36073
```

```
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------
## Iteration 34200 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 584.632
## delta (gene 1): 9.45015
## s (cell 1): 1.01365
## nu (cell 1): 1.02759
## theta (batch 1): 0.0566596
## betas:    1.1386  -0.1861  -0.5683  -0.1457   0.2956   1.0679   1.6587   0.3283   1.6629   0.4439  -(
##
## sigma: 0.248245
## lambda (gene 1): 0.545027
## epsilon (gene 1): 0.792985
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------
## Iteration 34240 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 527.371
## delta (gene 1): 10.6929
## s (cell 1): 0.958556
## nu (cell 1): 1.05004
## theta (batch 1): 0.0429919
## betas:    0.7064  -0.1172  -0.7839  -0.2291   0.8215   1.2459   1.3764   0.7669   1.5728   0.2615   (
##
## sigma: 0.255633
## lambda (gene 1): 0.815724
## epsilon (gene 1): 0.933041
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------
## Iteration 34280 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 569.86
## delta (gene 1): 11.1441
## s (cell 1): 0.878906
## nu (cell 1): 1.03049
```

```
## theta (batch 1): 0.0594592
## betas:     0.5719  -0.1094  -0.1466  -0.1589   0.5669   1.3938   1.3161   0.9664   1.3157   0.7757  -(
##
## sigma: 0.249708
## lambda (gene 1): 0.339065
## epsilon (gene 1): 0.942983
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 34320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 898.274
## delta (gene 1): 14.2774
## s (cell 1): 1.14993
## nu (cell 1): 1.07142
## theta (batch 1): 0.0348176
## betas:     1.1831  -0.2143  -0.8067  -0.9284   0.9168   0.6894   1.5498   0.6000   1.4908   0.6185  -(
##
## sigma: 0.246575
## lambda (gene 1): 0.249559
## epsilon (gene 1): 1.19163
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 34360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 688.38
## delta (gene 1): 10.3687
## s (cell 1): 0.937297
## nu (cell 1): 1.03095
## theta (batch 1): 0.0253202
## betas:     1.2303  -0.1616  -1.1661  -0.1464   0.2258   1.1462   1.0479   0.9236   1.1456   0.4797   (
##
## sigma: 0.252191
## lambda (gene 1): 0.473745
## epsilon (gene 1): 0.867672
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 34400 out of 40000 has been completed.
```

```
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 394.346
## delta (gene 1): 12.6645
## s (cell 1): 0.973655
## nu (cell 1): 1.03405
## theta (batch 1): 0.0712925
## betas:    1.0840  -0.0035  -1.0392   0.3593   0.5182   1.1271   1.2377   0.5799   0.9540   0.4870  -(
##
## sigma: 0.24644
## lambda (gene 1): 0.618383
## epsilon (gene 1): 1.08599
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 34440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 524.153
## delta (gene 1): 15.655
## s (cell 1): 0.781234
## nu (cell 1): 1.0343
## theta (batch 1): 0.058994
## betas:    1.2678  -0.1745  -0.8268  -0.3916   0.2630   1.1210   1.1664   0.8201   1.0620   0.7959  -(
##
## sigma: 0.265137
## lambda (gene 1): 0.281767
## epsilon (gene 1): 1.24829
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 34480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 543.965
## delta (gene 1): 8.56728
## s (cell 1): 1.54536
## nu (cell 1): 1.01125
## theta (batch 1): 0.0714142
## betas:    1.0673  -0.1902  -0.1725   0.0760   0.0745   1.3163   1.0531   1.1316   1.1227   0.6816   (
##
## sigma: 0.254792
## lambda (gene 1): 1.01139
## epsilon (gene 1): 0.662554
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 34520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 641.891
## delta (gene 1): 12.1153
## s (cell 1): 1.15443
## nu (cell 1): 1.11038
## theta (batch 1): 0.0290958
## betas:    0.9127  -0.2274  -0.3082   0.6379  -0.5407   1.6777   1.2760   0.8070   1.5336   0.8148  -(
##
## sigma: 0.248002
## lambda (gene 1): 0.197361
## epsilon (gene 1): 1.056
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 34560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 631.88
## delta (gene 1): 8.68784
## s (cell 1): 1.09648
## nu (cell 1): 1.04876
## theta (batch 1): 0.0126895
## betas:    1.1416  -0.2061   0.1998  -0.6711   0.5930   0.6929   1.7836   0.4615   1.3398   1.0195  -(
##
## sigma: 0.257205
## lambda (gene 1): 0.671888
## epsilon (gene 1): 0.695
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 34600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 533.097
## delta (gene 1): 9.71359
## s (cell 1): 0.910952
## nu (cell 1): 1.04157
## theta (batch 1): 0.00358694
## betas:    0.8806  -0.0901   0.0110   0.8739  -0.4071   1.7851   1.0196   0.9826   1.0338   0.7484  -(
```

```
##
## sigma: 0.263471
## lambda (gene 1): 0.603116
## epsilon (gene 1): 0.853071
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 34640 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 502.263
## delta (gene 1): 14.4538
## s (cell 1): 1.07691
## nu (cell 1): 1.05253
## theta (batch 1): 0.00553597
## betas:     1.0387   -0.1984    0.3932   -0.6032    0.2153    1.3444    1.2118    0.9402    1.2045    0.9142   -(
##
## sigma: 0.257591
## lambda (gene 1): 0.350109
## epsilon (gene 1): 1.21158
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 34680 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.871
## delta (gene 1): 9.40579
## s (cell 1): 0.897619
## nu (cell 1): 1.08243
## theta (batch 1): 0.0308284
## betas:     0.7785   -0.2175   -0.6210    0.0247    0.3785    1.4972    1.2501    0.9393    1.5650    0.8664   -(
##
## sigma: 0.252901
## lambda (gene 1): 0.870593
## epsilon (gene 1): 0.822506
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 34720 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 518.778
## delta (gene 1): 10.9576
## s (cell 1): 0.960939
## nu (cell 1): 0.988338
## theta (batch 1): 0.0487919
## betas:    1.7410  -0.1846  -1.3193  -0.0744  -0.2459   1.1045   1.0575   0.4335   1.2185   0.6464  -(
##
## sigma: 0.24717
## lambda (gene 1): 1.07689
## epsilon (gene 1): 0.97095
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 34760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 367.026
## delta (gene 1): 11.4231
## s (cell 1): 1.11684
## nu (cell 1): 1.00979
## theta (batch 1): 0.0597634
## betas:    1.3065  -0.0621  -0.1263   0.0445  -0.1518   1.6214   0.7694   0.7903   1.0207   0.2210  -(
##
## sigma: 0.240819
## lambda (gene 1): 0.44718
## epsilon (gene 1): 0.984021
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 34800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 871.032
## delta (gene 1): 12.7951
## s (cell 1): 1.23681
## nu (cell 1): 1.09933
## theta (batch 1): 0.0136763
## betas:    1.0159  -0.1139   0.3248  -0.2137   0.1710   1.3561   1.2931   0.6896   1.2255   0.7129  -(
##
## sigma: 0.254543
## lambda (gene 1): 0.476899
## epsilon (gene 1): 1.1208
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 34840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.957
## delta (gene 1): 11.5464
## s (cell 1): 1.08596
## nu (cell 1): 1.04224
## theta (batch 1): 0.00239716
## betas:    0.9500  -0.1896  -0.3114  -0.3561   0.3628   1.5342   1.2548   0.8592   1.3573   0.6951
##
## sigma: 0.253685
## lambda (gene 1): 0.981615
## epsilon (gene 1): 0.95833
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 34880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 485.149
## delta (gene 1): 9.52203
## s (cell 1): 1.04247
## nu (cell 1): 0.976275
## theta (batch 1): 0.00736255
## betas:    0.9640  -0.1246  -0.4073  -0.5403   0.6642   1.0358   1.1439   1.1471   0.8538   0.9436
##
## sigma: 0.251313
## lambda (gene 1): 0.427903
## epsilon (gene 1): 0.802178
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 34920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 577.535
## delta (gene 1): 13.1237
## s (cell 1): 1.11661
## nu (cell 1): 1.06161
## theta (batch 1): 0.00535659
## betas:    1.1121  -0.1147  -0.9079  -0.2067   0.4031   1.4201   1.0496   0.8400   1.0447   0.8427
##
## sigma: 0.244797
```

```
## lambda (gene 1): 0.644018
## epsilon (gene 1): 1.13151
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 34960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 274.781
## delta (gene 1): 11.0643
## s (cell 1): 0.963863
## nu (cell 1): 1.07634
## theta (batch 1): 0.0097118
## betas:    0.7570  -0.0788  -0.9072  -0.0875   1.0595   0.8322   1.9059   0.2447   1.7171   0.2205   -
##
## sigma: 0.251746
## lambda (gene 1): 0.939889
## epsilon (gene 1): 0.9781
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 35000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 567.103
## delta (gene 1): 7.73431
## s (cell 1): 1.12192
## nu (cell 1): 1.00434
## theta (batch 1): 0.0220109
## betas:    0.4856  -0.1163  -0.4629   0.1492   0.6028   1.2469   1.5286   0.8985   1.3991   0.8701   -
##
## sigma: 0.264024
## lambda (gene 1): 1.32927
## epsilon (gene 1): 0.656555
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 35040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 367.262
## delta (gene 1): 10.5637
```

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## s (cell 1): 0.892992
## nu (cell 1): 0.987827
## theta (batch 1): 0.00823146
## betas:    0.4628  -0.1725  -0.5650   0.5145  -0.2040   1.8087   1.0663   1.3692   1.3140   0.8189  (
##
## sigma: 0.250444
## lambda (gene 1): 1.1541
## epsilon (gene 1): 0.906467
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 35080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.119
## delta (gene 1): 10.1691
## s (cell 1): 1.04454
## nu (cell 1): 1.08144
## theta (batch 1): 0.0103966
## betas:    1.2592  -0.2912  -1.2427  -0.9508   1.1769   0.5629   1.6105   0.6046   1.5796   0.8428  (
##
## sigma: 0.239271
## lambda (gene 1): 0.929609
## epsilon (gene 1): 0.875784
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 35120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 568.762
## delta (gene 1): 10.3029
## s (cell 1): 1.27408
## nu (cell 1): 1.05843
## theta (batch 1): 0.0225281
## betas:    1.5696  -0.1356  -0.6223  -0.5061   0.2666   0.9022   1.5193   0.0815   1.3370   0.5659  -
##
## sigma: 0.242616
## lambda (gene 1): 1.03726
## epsilon (gene 1): 0.892092
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

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## --------------------------------------------------------
## Iteration 35160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 756.234
## delta (gene 1): 11.5017
## s (cell 1): 0.938723
## nu (cell 1): 1.0578
## theta (batch 1): 0.00548913
## betas:    1.1764  -0.1837  -0.2385  -0.0408  -0.3802   1.9611   0.6848   0.9565   1.3198   0.6762  -(
##
## sigma: 0.239403
## lambda (gene 1): 0.478348
## epsilon (gene 1): 1.00227
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 684.99
## delta (gene 1): 11.3198
## s (cell 1): 1.32
## nu (cell 1): 1.10418
## theta (batch 1): 0.00708305
## betas:    1.1744  -0.2754  -0.8412  -0.0540  -0.1909   1.3524   1.3730   0.5144   1.8501   0.6287  -(
##
## sigma: 0.247588
## lambda (gene 1): 0.364513
## epsilon (gene 1): 0.990825
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.122
## delta (gene 1): 12.2856
## s (cell 1): 1.0174
## nu (cell 1): 1.0325
## theta (batch 1): 0.00263444
## betas:    0.9715  -0.2924  -0.7851  -1.0192   0.5877   1.4185   1.2000   0.9392   1.6187   0.8739   (
##
## sigma: 0.250692
## lambda (gene 1): 0.431361
## epsilon (gene 1): 1.08628
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 35280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 417.172
## delta (gene 1): 9.38298
## s (cell 1): 0.969334
## nu (cell 1): 1.02997
## theta (batch 1): 0.00638849
## betas:    1.5220  -0.2127  -0.5870  -0.1951  -0.2213   1.4959   0.7898   0.9277   1.0362   0.8772  -(
##
## sigma: 0.246692
## lambda (gene 1): 1.26246
## epsilon (gene 1): 0.799312
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 35320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 350.459
## delta (gene 1): 10.2873
## s (cell 1): 1.14374
## nu (cell 1): 1.12535
## theta (batch 1): 0.00599973
## betas:    1.7178  -0.2733   0.8613  -1.4921  -0.2744   1.5810   0.7391   0.7590   1.3968   0.6346  -(
##
## sigma: 0.255651
## lambda (gene 1): 0.859484
## epsilon (gene 1): 0.897692
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 35360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 656.393
## delta (gene 1): 8.37779
## s (cell 1): 1.07109
## nu (cell 1): 1.04357
```

```
## theta (batch 1): 0.0100499
## betas:    1.4393  -0.2405  -0.2897   0.0087  -0.2080   0.9763   1.3288   0.7763   1.0239   1.1913  -(
##
## sigma: 0.24895
## lambda (gene 1): 0.43918
## epsilon (gene 1): 0.646771
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 35400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 706.251
## delta (gene 1): 10.4632
## s (cell 1): 1.05612
## nu (cell 1): 1.1159
## theta (batch 1): 0.0312068
## betas:    1.2685  -0.2160  -0.1900  -0.4382   0.1482   0.9805   1.5006   0.5260   1.5080   0.5111   (
##
## sigma: 0.241608
## lambda (gene 1): 1.28774
## epsilon (gene 1): 0.90043
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 35440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 709.537
## delta (gene 1): 11.6555
## s (cell 1): 1.08939
## nu (cell 1): 1.08925
## theta (batch 1): 0.0572729
## betas:    0.7734  -0.1411  -0.0183   0.4029  -0.1479   1.5258   1.2533   0.9097   1.2558   1.0251  -(
##
## sigma: 0.265585
## lambda (gene 1): 0.511248
## epsilon (gene 1): 1.00253
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 35480 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 482.842
## delta (gene 1): 10.7528
## s (cell 1): 1.08675
## nu (cell 1): 1.06453
## theta (batch 1): 0.015158
## betas:    1.2452  -0.1871   0.1105  -0.2764  -0.2917   1.6807   1.0142   0.8405   1.1375   1.0160  -(
##
## sigma: 0.251939
## lambda (gene 1): 0.666654
## epsilon (gene 1): 0.942089
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 35520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 371.993
## delta (gene 1): 10.2926
## s (cell 1): 1.02308
## nu (cell 1): 0.981701
## theta (batch 1): 0.00625734
## betas:    0.7411  -0.2377   1.1011  -0.4515  -0.2859   2.1524   0.8487   1.1578   1.6357   0.6393   (
##
## sigma: 0.255261
## lambda (gene 1): 0.322757
## epsilon (gene 1): 0.878361
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 35560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1031.53
## delta (gene 1): 12.6821
## s (cell 1): 1.02528
## nu (cell 1): 1.04214
## theta (batch 1): 0.00187167
## betas:    1.4744  -0.3321   0.2858  -0.4661  -0.2033   1.1830   0.9360   1.1770   1.1525   0.9707   (
##
## sigma: 0.24544
## lambda (gene 1): 0.455541
## epsilon (gene 1): 1.04954
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 632.8
## delta (gene 1): 9.85082
## s (cell 1): 1.11147
## nu (cell 1): 1.11403
## theta (batch 1): 0.000433316
## betas:    1.0844  -0.1592   0.6553  -0.0003  -0.2350   1.5206   0.9848   1.1357   0.8793   0.9574  -(
##
## sigma: 0.276102
## lambda (gene 1): 0.276872
## epsilon (gene 1): 0.846488
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 617.57
## delta (gene 1): 8.0174
## s (cell 1): 1.07514
## nu (cell 1): 1.06982
## theta (batch 1): 0.00024037
## betas:    1.2089  -0.2509  -0.2714  -0.4260   0.1933   1.1558   1.2018   0.9696   1.2337   0.9517  -(
##
## sigma: 0.256092
## lambda (gene 1): 0.448442
## epsilon (gene 1): 0.629783
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 613.14
## delta (gene 1): 11.2602
## s (cell 1): 1.0802
## nu (cell 1): 1.05372
## theta (batch 1): 0.000406899
## betas:    0.9157  -0.0272   0.3413  -0.0085   0.4276   1.1544   1.5721   0.3956   1.2011   0.5967  -
```

```
## 
## sigma: 0.246409
## lambda (gene 1): 0.191726
## epsilon (gene 1): 0.982677
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 301.863
## delta (gene 1): 8.80791
## s (cell 1): 1.03227
## nu (cell 1): 1.03015
## theta (batch 1): 0.000147374
## betas:    0.5452  -0.0266  -0.4940   0.3333   0.5594   1.7176   1.0449   1.0130   1.0552   0.7264  -(
## 
## sigma: 0.252232
## lambda (gene 1): 0.519442
## epsilon (gene 1): 0.74484
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 646.858
## delta (gene 1): 10.2585
## s (cell 1): 1.06511
## nu (cell 1): 1.05523
## theta (batch 1): 0.000331896
## betas:    0.6855  -0.1284  -0.8824  -0.5592   0.6643   1.8683   0.7602   1.2086   1.3509   0.5362  -(
## 
## sigma: 0.248882
## lambda (gene 1): 0.401893
## epsilon (gene 1): 0.910504
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 389.503
## delta (gene 1): 10.1428
## s (cell 1): 1.05739
## nu (cell 1): 1.04274
## theta (batch 1): 0.000514825
## betas:    1.0815  -0.1560  -0.7257  -0.8186   0.2344   1.6177   0.8524   0.9279   1.4616   0.2453  -(
##
## sigma: 0.251344
## lambda (gene 1): 1.27026
## epsilon (gene 1): 0.89477
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 824.056
## delta (gene 1): 11.743
## s (cell 1): 1.01
## nu (cell 1): 0.995258
## theta (batch 1): 0.00224396
## betas:    0.4140  -0.1361  -0.6873  -0.6123   0.8113   1.8290   0.9223   1.4801   0.9881   1.4100  -(
##
## sigma: 0.252502
## lambda (gene 1): 1.44399
## epsilon (gene 1): 1.02937
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 35880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 501.223
## delta (gene 1): 9.85118
## s (cell 1): 0.894458
## nu (cell 1): 1.04185
## theta (batch 1): 0.0249943
## betas:    1.4701  -0.1803  -1.2623  -0.1308   0.0235   1.3644   1.0487   0.4509   1.5569   0.2395  -(
##
## sigma: 0.244736
## lambda (gene 1): 1.63303
## epsilon (gene 1): 0.85695
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 35920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 279.765
## delta (gene 1): 11.4424
## s (cell 1): 1.14622
## nu (cell 1): 0.973667
## theta (batch 1): 0.0530118
## betas:    1.2610  -0.1355   0.0184  -0.6278   0.5891   0.8625   1.5580   0.3413   1.4172   0.5518  -(
##
## sigma: 0.236153
## lambda (gene 1): 1.30186
## epsilon (gene 1): 0.993584
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 35960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 389.933
## delta (gene 1): 11.1905
## s (cell 1): 1.17627
## nu (cell 1): 1.04353
## theta (batch 1): 0.0696241
## betas:    1.5967  -0.2717  -1.5946   0.1115   0.0331   0.9921   0.9452   0.9873   1.1383   0.7036   (
##
## sigma: 0.243173
## lambda (gene 1): 1.32283
## epsilon (gene 1): 0.959625
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 36000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 416.608
## delta (gene 1): 12.0815
## s (cell 1): 1.57782
## nu (cell 1): 1.08353
## theta (batch 1): 0.122265
## betas:    1.4095  -0.2064  -0.3433  -0.1202  -0.0696   1.2600   1.3859   0.2982   1.6066   0.4808  -(
##
## sigma: 0.244772
```

```
## lambda (gene 1): 0.787557
## epsilon (gene 1): 1.01695
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 36040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 852.604
## delta (gene 1): 11.3906
## s (cell 1): 1.55187
## nu (cell 1): 1.1538
## theta (batch 1): 0.0248769
## betas:    1.4641  -0.0938  -0.1995   0.2477   0.3210   0.4131   1.5589   0.5533   0.7737   0.7737  -
##
## sigma: 0.255786
## lambda (gene 1): 0.94641
## epsilon (gene 1): 0.945947
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 36080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 773.056
## delta (gene 1): 11.2724
## s (cell 1): 0.788354
## nu (cell 1): 0.979787
## theta (batch 1): 0.0219643
## betas:    1.2175  -0.2365  -0.0286  -0.8036   0.3195   1.3152   1.0341   0.9166   1.4238   0.5068   (
##
## sigma: 0.246963
## lambda (gene 1): 0.515714
## epsilon (gene 1): 0.944562
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 36120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 572.902
## delta (gene 1): 10.2644
```

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## s (cell 1): 0.848551
## nu (cell 1): 1.07092
## theta (batch 1): 0.0678368
## betas:    0.7155  -0.2006  -0.1163  -0.2406   0.4580   1.3066   1.6523   0.4427   2.0818   0.3175   (
##
## sigma: 0.250115
## lambda (gene 1): 0.652693
## epsilon (gene 1): 0.900866
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 36160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 595.174
## delta (gene 1): 9.67376
## s (cell 1): 1.11503
## nu (cell 1): 1.13508
## theta (batch 1): 0.0639399
## betas:    1.1277  -0.1007  -0.2341  -0.4797   0.5474   1.3534   1.0349   0.7477   1.1992   0.5379  -(
##
## sigma: 0.258798
## lambda (gene 1): 0.826176
## epsilon (gene 1): 0.852876
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 36200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 363.728
## delta (gene 1): 10.2115
## s (cell 1): 1.17
## nu (cell 1): 1.07157
## theta (batch 1): 0.0868052
## betas:    1.1046  -0.1942   0.3973  -0.7951   0.1787   1.2844   1.1560   0.8780   1.2599   0.7798  -(
##
## sigma: 0.238673
## lambda (gene 1): 0.487589
## epsilon (gene 1): 0.870189
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## --------------------------------------------------------
## Iteration 36240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 290.495
## delta (gene 1): 11.4831
## s (cell 1): 1.17574
## nu (cell 1): 1.04314
## theta (batch 1): 0.0396156
## betas:    0.7592  -0.1852  -0.1598  -0.2095   0.4737   1.6664   0.8116   1.2915   1.2947   0.7603   (
##
## sigma: 0.245777
## lambda (gene 1): 0.245151
## epsilon (gene 1): 0.9763
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 36280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 402.454
## delta (gene 1): 11.6305
## s (cell 1): 1.1776
## nu (cell 1): 1.06536
## theta (batch 1): 0.0450581
## betas:    0.8404  -0.2639  -0.3768  -0.3086   0.2369   1.2699   1.5159   0.6766   1.8412   0.8136  -(
##
## sigma: 0.250787
## lambda (gene 1): 0.854072
## epsilon (gene 1): 1.01406
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 36320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 279.998
## delta (gene 1): 12.3966
## s (cell 1): 0.964
## nu (cell 1): 0.999676
## theta (batch 1): 0.0454787
## betas:    0.4860  -0.1746  -0.0868  -0.1034   0.8047   1.2758   1.4368   1.0635   1.4315   0.9851  -(
##
## sigma: 0.237566
## lambda (gene 1): 0.19373
## epsilon (gene 1): 1.0703
```

```
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 36360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 546.137
## delta (gene 1): 9.1575
## s (cell 1): 2.24929
## nu (cell 1): 1.09842
## theta (batch 1): 0.0806902
## betas:    1.4140  -0.2190   0.4651  -0.7379  -0.6231   1.7281   0.8200   0.9312   1.1488   0.7286  -(
##
## sigma: 0.251245
## lambda (gene 1): 1.07883
## epsilon (gene 1): 0.740515
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 36400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 595.592
## delta (gene 1): 11.4709
## s (cell 1): 1.13155
## nu (cell 1): 0.999883
## theta (batch 1): 0.119271
## betas:    1.0538  -0.1768  -0.2362  -0.3706   0.0575   1.6107   0.9446   1.0962   1.0841   0.7312   (
##
## sigma: 0.254209
## lambda (gene 1): 0.828079
## epsilon (gene 1): 0.96363
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 36440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 348.195
## delta (gene 1): 11.9847
## s (cell 1): 0.898134
## nu (cell 1): 1.05124
```

```
## theta (batch 1): 0.0201657
## betas:    0.6498  -0.0941   0.1043  -0.5011   0.3492   1.5060   1.2864   0.8707   1.3203   0.5844  -(
##
## sigma: 0.244018
## lambda (gene 1): 0.365301
## epsilon (gene 1): 0.995735
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 36480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 441.509
## delta (gene 1): 9.55325
## s (cell 1): 0.959677
## nu (cell 1): 1.14641
## theta (batch 1): 0.0117038
## betas:    0.5697  -0.2694  -0.7337  -0.5961   0.4886   1.5016   1.2321   1.3386   1.3688   1.2996  -(
##
## sigma: 0.261146
## lambda (gene 1): 0.706392
## epsilon (gene 1): 0.796172
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 36520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 542.475
## delta (gene 1): 9.59678
## s (cell 1): 0.856271
## nu (cell 1): 1.0608
## theta (batch 1): 0.0467236
## betas:    0.5481  -0.1418  -0.3962   0.3375   0.1429   1.5002   1.5930   0.6293   1.7703   0.5735  -(
##
## sigma: 0.25173
## lambda (gene 1): 0.985581
## epsilon (gene 1): 0.835611
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 36560 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 819.826
## delta (gene 1): 9.33189
## s (cell 1): 1.49587
## nu (cell 1): 1.00476
## theta (batch 1): 0.041028
## betas:    0.9131  -0.1641  -0.1063  -0.8460   0.7552   1.2567   1.2410   0.8706   1.4499   0.3599   (
##
## sigma: 0.25949
## lambda (gene 1): 0.427746
## epsilon (gene 1): 0.770711
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 36600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 389.127
## delta (gene 1): 9.40347
## s (cell 1): 1.47719
## nu (cell 1): 0.998157
## theta (batch 1): 0.0557264
## betas:    1.2519  -0.2820  -1.0276  -0.0234   0.0255   0.8887   1.6372   0.6185   1.4514   1.0436  -(
##
## sigma: 0.254862
## lambda (gene 1): 0.890386
## epsilon (gene 1): 0.783529
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 36640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 529.439
## delta (gene 1): 11.8329
## s (cell 1): 1.14424
## nu (cell 1): 1.02839
## theta (batch 1): 0.00594894
## betas:    0.8271  -0.1702   0.0081  -0.4889   0.5865   1.2999   1.1973   0.9651   1.4806   0.4855   (
##
## sigma: 0.255295
## lambda (gene 1): 0.28756
## epsilon (gene 1): 1.02963
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 36680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 624.606
## delta (gene 1): 11.3464
## s (cell 1): 1.19076
## nu (cell 1): 1.02668
## theta (batch 1): 0.0120918
## betas:     0.4915  -0.1092  -0.6504   0.6377   0.1157   1.6829   1.2669   0.9578   1.5142   0.5108  -(
##
## sigma: 0.259199
## lambda (gene 1): 0.925794
## epsilon (gene 1): 0.987282
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 36720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 281.861
## delta (gene 1): 8.27276
## s (cell 1): 1.09006
## nu (cell 1): 1.09285
## theta (batch 1): 0.00969972
## betas:     1.2950  -0.1416  -0.9628  -0.2563   0.1289   1.3473   1.0643   0.7773   0.9898   0.8457  -(
##
## sigma: 0.243537
## lambda (gene 1): 0.858012
## epsilon (gene 1): 0.674223
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 36760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 745.428
## delta (gene 1): 9.554
## s (cell 1): 0.988879
## nu (cell 1): 1.0472
## theta (batch 1): 0.0030929
## betas:     1.1556  -0.2508  -0.4236  -0.9690   0.0628   1.9454   0.6139   1.1943   1.4078   0.5419   (
```

```
## 
## sigma: 0.25407
## lambda (gene 1): 0.452108
## epsilon (gene 1): 0.795301
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 36800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 430.019
## delta (gene 1): 12.8468
## s (cell 1): 1.07388
## nu (cell 1): 1.05048
## theta (batch 1): 0.00438342
## betas:    0.5520  -0.1846  -0.2932  -1.1273   0.5879   2.0108   0.8475   1.2915   1.4466   0.7730
## 
## sigma: 0.266759
## lambda (gene 1): 0.59554
## epsilon (gene 1): 1.09919
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 36840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 344.311
## delta (gene 1): 12.1979
## s (cell 1): 0.902392
## nu (cell 1): 1.00559
## theta (batch 1): 0.00573881
## betas:    0.4166  -0.0042  -0.5535   0.1020   0.6975   1.1634   1.6386   0.7656   1.1098   0.8826  -
## 
## sigma: 0.240862
## lambda (gene 1): 0.610437
## epsilon (gene 1): 1.04267
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 36880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 665.585
## delta (gene 1): 6.5731
## s (cell 1): 1.20326
## nu (cell 1): 1.04982
## theta (batch 1): 0.0223216
## betas:     0.9728  -0.2383  -0.2318  -0.8488   0.0404   1.7792   1.1016   0.7848   1.6527   0.7107  -(
##
## sigma: 0.250944
## lambda (gene 1): 1.41092
## epsilon (gene 1): 0.448227
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 36920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 588.342
## delta (gene 1): 10.3606
## s (cell 1): 1.05892
## nu (cell 1): 1.06396
## theta (batch 1): 0.0292972
## betas:     0.3013  -0.1653  -1.3110   0.4459   0.9622   0.9259   1.7822   1.0634   1.3393   1.1686  -(
##
## sigma: 0.254126
## lambda (gene 1): 1.04804
## epsilon (gene 1): 0.896426
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 36960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 641.673
## delta (gene 1): 8.24502
## s (cell 1): 0.972406
## nu (cell 1): 1.06132
## theta (batch 1): 0.0482501
## betas:     1.2285  -0.0606  -0.2360  -0.3160   0.3455   1.0465   1.6514  -0.0612   1.6447   0.1570  -(
##
## sigma: 0.250662
## lambda (gene 1): 1.14727
## epsilon (gene 1): 0.68
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 37000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 447.144
## delta (gene 1): 11.6211
## s (cell 1): 1.25659
## nu (cell 1): 1.08701
## theta (batch 1): 0.0134227
## betas:    1.0502  -0.1818  -0.9284  -0.0487   0.0985   1.4725   1.3646   0.6435   1.4698   0.6108  -0
##
## sigma: 0.263446
## lambda (gene 1): 0.570296
## epsilon (gene 1): 1.01312
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 37040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1127.04
## delta (gene 1): 12.6506
## s (cell 1): 0.876932
## nu (cell 1): 1.01823
## theta (batch 1): 0.00280387
## betas:    1.4100  -0.2320  -0.9642  -0.0214   0.3183   0.7024   1.6493   0.2430   1.6733   0.5566  -0
##
## sigma: 0.256532
## lambda (gene 1): 0.677716
## epsilon (gene 1): 1.10894
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 37080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 601.222
## delta (gene 1): 10.6152
## s (cell 1): 1.00409
## nu (cell 1): 0.991907
## theta (batch 1): 0.00146256
## betas:    1.1939  -0.3376  -0.2604  -0.8077   0.3173   1.1992   1.4576   0.6020   1.7538   1.0742  -0
##
## sigma: 0.254301
```

```
## lambda (gene 1): 0.373501
## epsilon (gene 1): 0.877761
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 389.34
## delta (gene 1): 9.33913
## s (cell 1): 0.990914
## nu (cell 1): 1.04669
## theta (batch 1): 0.00216533
## betas:    1.0373  -0.2812   0.5002  -0.9753   0.4784   1.2087   1.2383   0.9719   1.5634   0.7205   (
##
## sigma: 0.261464
## lambda (gene 1): 1.5067
## epsilon (gene 1): 0.785816
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 545.357
## delta (gene 1): 9.66223
## s (cell 1): 1.07918
## nu (cell 1): 1.15403
## theta (batch 1): 0.00249699
## betas:    0.7631  -0.2665   0.2119   0.5915   0.0010   1.2498   1.4775   0.9617   1.6300   0.8345   (
##
## sigma: 0.261935
## lambda (gene 1): 0.383867
## epsilon (gene 1): 0.773562
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 488.007
## delta (gene 1): 10.5969
```

```
## s (cell 1): 1.06904
## nu (cell 1): 1.06313
## theta (batch 1): 0.0173769
## betas:    1.4395  -0.2803   0.2698  -0.6795   0.0345   1.2481   1.0050   0.9278   1.3458   0.8037  -(
##
## sigma: 0.246919
## lambda (gene 1): 0.95998
## epsilon (gene 1): 0.920195
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 498.702
## delta (gene 1): 7.02441
## s (cell 1): 1.06297
## nu (cell 1): 1.07214
## theta (batch 1): 0.0149515
## betas:    1.3240  -0.2772  -0.2859  -1.0783   0.8801   0.6666   1.3492   0.7758   1.4631   0.7387  -(
##
## sigma: 0.238777
## lambda (gene 1): 0.260778
## epsilon (gene 1): 0.515883
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 426.22
## delta (gene 1): 10.8016
## s (cell 1): 0.922854
## nu (cell 1): 1.06756
## theta (batch 1): 0.00370531
## betas:    1.1807  -0.2095  -0.2636  -0.2124   0.5597   0.7043   1.6686   0.5651   1.2185   1.2317  -(
##
## sigma: 0.270446
## lambda (gene 1): 1.03254
## epsilon (gene 1): 0.927095
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ----------------------------------------------------------
## Iteration 37320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 598.167
## delta (gene 1): 7.26808
## s (cell 1): 0.998934
## nu (cell 1): 1.02292
## theta (batch 1): 0.00999522
## betas:    2.3402  -0.3246   0.2036  -1.1470  -0.5721   0.9068   1.0689   0.3321   1.1985   0.6993  -(
##
## sigma: 0.252546
## lambda (gene 1): 0.96547
## epsilon (gene 1): 0.495909
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 387.456
## delta (gene 1): 7.28017
## s (cell 1): 1.06243
## nu (cell 1): 1.03391
## theta (batch 1): 0.0183268
## betas:    1.9841  -0.3690   0.1992  -1.2632  -0.3081   1.1207   0.8627   0.7756   1.3794   0.6745   (
##
## sigma: 0.263426
## lambda (gene 1): 1.88377
## epsilon (gene 1): 0.531705
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 617.513
## delta (gene 1): 9.525
## s (cell 1): 0.878252
## nu (cell 1): 1.0939
## theta (batch 1): 0.0307459
## betas:    1.8616  -0.2191   0.0623  -0.1845  -0.1448   1.0149   1.0671   0.3333   1.6359  -0.1541   (
##
## sigma: 0.25169
## lambda (gene 1): 0.723382
## epsilon (gene 1): 0.788737
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 656.322
## delta (gene 1): 9.41244
## s (cell 1): 0.923256
## nu (cell 1): 1.10913
## theta (batch 1): 0.0240291
## betas:    1.5215  -0.2332  -0.2048  -0.7063   0.3231   1.2392   0.9443   0.8379   1.1923   0.7900  -(
##
## sigma: 0.247407
## lambda (gene 1): 0.185316
## epsilon (gene 1): 0.812276
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 349.831
## delta (gene 1): 9.46765
## s (cell 1): 0.892534
## nu (cell 1): 1.07915
## theta (batch 1): 0.0187217
## betas:    0.9952  -0.2215  -0.3445   0.0422   0.1553   1.2873   1.3135   0.8501   1.4194   0.8140  -(
##
## sigma: 0.255244
## lambda (gene 1): 0.623468
## epsilon (gene 1): 0.790906
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 349.182
## delta (gene 1): 8.26511
## s (cell 1): 1.08281
## nu (cell 1): 1.02051
```

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## theta (batch 1): 0.0241328
## betas:    0.6215  -0.1737  -0.1085  -0.4666   0.6418   1.4216   1.5181   0.6292   1.8386   0.5844  -(
##
## sigma: 0.258347
## lambda (gene 1): 1.96307
## epsilon (gene 1): 0.654503
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 732.979
## delta (gene 1): 10.978
## s (cell 1): 0.95338
## nu (cell 1): 1.04829
## theta (batch 1): 0.0153167
## betas:    0.9113  -0.0997   0.1953   0.1338   0.4347   0.9392   1.6537   0.4817   1.3387   0.6251  -(
##
## sigma: 0.260485
## lambda (gene 1): 0.434857
## epsilon (gene 1): 0.925575
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 796.56
## delta (gene 1): 9.35233
## s (cell 1): 0.861164
## nu (cell 1): 1.03957
## theta (batch 1): 0.0304327
## betas:    1.3868  -0.1808  -0.1115  -0.5502   0.3694   0.9631   1.2805   0.5906   1.3224   0.5651  -(
##
## sigma: 0.267175
## lambda (gene 1): 0.531842
## epsilon (gene 1): 0.788703
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37640 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.211
## delta (gene 1): 9.75325
## s (cell 1): 1.01411
## nu (cell 1): 1.06239
## theta (batch 1): 0.00734926
## betas:    1.8511  -0.2391  -0.6513   0.0214  -0.3618   0.5784   1.6665   0.0726   1.4394   0.5609  -(
##
## sigma: 0.248434
## lambda (gene 1): 0.715096
## epsilon (gene 1): 0.808466
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 705.554
## delta (gene 1): 13.486
## s (cell 1): 0.80893
## nu (cell 1): 1.12839
## theta (batch 1): 0.0285869
## betas:    1.5012  -0.1518   0.7308  -0.0976  -0.1287   0.7743   1.5518   0.3820   1.1009   0.7301  -(
##
## sigma: 0.236741
## lambda (gene 1): 0.843823
## epsilon (gene 1): 1.13084
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 37720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 469.146
## delta (gene 1): 10.0975
## s (cell 1): 1.09348
## nu (cell 1): 1.05441
## theta (batch 1): 0.0172451
## betas:    1.1016  -0.2892   0.3565  -0.4710   0.3463   0.8950   1.4862   0.9402   1.2740   1.1941  -(
##
## sigma: 0.249831
## lambda (gene 1): 0.306883
## epsilon (gene 1): 0.829718
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 824.684
## delta (gene 1): 8.03384
## s (cell 1): 1.08103
## nu (cell 1): 1.08396
## theta (batch 1): 0.00175694
## betas:    1.8023  -0.2943   0.4329  -1.2530  -0.1234   1.0281   1.3169   0.2279   1.7652   0.3466  -(
##
## sigma: 0.261723
## lambda (gene 1): 0.741199
## epsilon (gene 1): 0.630013
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 672.949
## delta (gene 1): 9.20718
## s (cell 1): 1.14967
## nu (cell 1): 1.11529
## theta (batch 1): 0.00131239
## betas:    1.5060  -0.2713   1.0232  -0.6366   0.0567   0.6539   1.5842   0.5735   1.3164   0.8749  -(
##
## sigma: 0.257559
## lambda (gene 1): 0.26466
## epsilon (gene 1): 0.767859
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 37840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 457.122
## delta (gene 1): 13.2843
## s (cell 1): 0.961251
## nu (cell 1): 1.08797
## theta (batch 1): 0.00510999
## betas:    2.0453  -0.2933  -0.5893  -0.2480  -0.4126   1.1114   0.9314   0.4020   1.5178   0.4158  -(
```

```
## 
## sigma: 0.246368
## lambda (gene 1): 0.811453
## epsilon (gene 1): 1.16998
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 37880 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 457.204
## delta (gene 1): 6.61381
## s (cell 1): 1.02542
## nu (cell 1): 1.08084
## theta (batch 1): 0.00283211
## betas:    1.3304  -0.1739  -0.0234  -0.0618   0.0837   0.7933   1.5789   0.4507   1.2816   0.7735  -(
## 
## sigma: 0.250861
## lambda (gene 1): 0.84114
## epsilon (gene 1): 0.463636
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 37920 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 330.798
## delta (gene 1): 8.04494
## s (cell 1): 1.21511
## nu (cell 1): 1.07904
## theta (batch 1): 0.0105042
## betas:    1.5704  -0.2435   0.1511  -1.0915   0.0711   1.1600   1.1625   0.5150   1.4665   0.6513  -(
## 
## sigma: 0.254977
## lambda (gene 1): 0.829478
## epsilon (gene 1): 0.656088
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------------
## Iteration 37960 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 408.902
## delta (gene 1): 7.14047
## s (cell 1): 1.27864
## nu (cell 1): 1.04337
## theta (batch 1): 0.0148898
## betas:    0.3827  -0.2537   0.7947  -0.6557   0.2973   1.7808   1.2682   1.2216   1.6910   0.9254   (
##
## sigma: 0.244247
## lambda (gene 1): 1.06523
## epsilon (gene 1): 0.502336
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 38000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 335.832
## delta (gene 1): 10.4915
## s (cell 1): 1.23059
## nu (cell 1): 1.09943
## theta (batch 1): 0.00913029
## betas:    0.9534  -0.3332  -0.6749  -1.1900   1.1317   0.7994   1.8067   0.4290   2.2072   0.6691   (
##
## sigma: 0.258647
## lambda (gene 1): 0.0683255
## epsilon (gene 1): 0.904231
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 38040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 628.739
## delta (gene 1): 10.2051
## s (cell 1): 1.22456
## nu (cell 1): 1.12747
## theta (batch 1): 0.0228729
## betas:    0.9834  -0.1590  -0.0178   0.0262   0.1512   1.5128   1.1262   0.7210   1.4773   0.6109   -(
##
## sigma: 0.2491
## lambda (gene 1): 0.466171
## epsilon (gene 1): 0.855554
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 38080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 523.005
## delta (gene 1): 9.07145
## s (cell 1): 0.806032
## nu (cell 1): 1.00868
## theta (batch 1): 0.0368943
## betas:    1.0890  -0.2279  -0.8161   0.2513  -0.0399   1.4085   1.1441   0.9277   1.3806   0.8109  -(
##
## sigma: 0.251567
## lambda (gene 1): 0.616607
## epsilon (gene 1): 0.781737
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 38120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 643.13
## delta (gene 1): 8.59781
## s (cell 1): 0.957931
## nu (cell 1): 0.998168
## theta (batch 1): 0.0297508
## betas:    0.3220  -0.1617   0.2106  -0.5532   0.9600   1.7452   1.1147   1.2805   1.5650   0.4799   (
##
## sigma: 0.247256
## lambda (gene 1): 0.523132
## epsilon (gene 1): 0.666858
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 38160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 542.772
## delta (gene 1): 6.41978
## s (cell 1): 1.22368
## nu (cell 1): 1.09536
## theta (batch 1): 0.0331363
## betas:    1.0122  -0.2514  -0.4588  -0.0029   0.0232   1.0093   1.7300   0.5216   1.6849   0.8367  -(
##
## sigma: 0.260268
```

```
## lambda (gene 1): 1.35101
## epsilon (gene 1): 0.366498
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 38200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 576.718
## delta (gene 1): 9.12017
## s (cell 1): 1.33155
## nu (cell 1): 1.0479
## theta (batch 1): 0.0439928
## betas:    1.2704  -0.2978   0.2280  -1.3015   0.3992   1.3459   1.1621   0.8122   1.5709   0.7708   (
##
## sigma: 0.241974
## lambda (gene 1): 0.59024
## epsilon (gene 1): 0.741724
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 38240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 633.397
## delta (gene 1): 9.68445
## s (cell 1): 0.815258
## nu (cell 1): 1.07596
## theta (batch 1): 0.0507589
## betas:    1.2162  -0.2045  -0.0263  -0.1950   0.2902   0.7536   1.5695   0.6778   1.2479   0.8264   -(
##
## sigma: 0.26233
## lambda (gene 1): 1.20288
## epsilon (gene 1): 0.815441
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 38280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 547.094
## delta (gene 1): 9.99614
```

```
## s (cell 1): 0.781385
## nu (cell 1): 1.02163
## theta (batch 1): 0.0368229
## betas:    1.5658  -0.2759   0.4046  -1.2216   0.0650   1.3811   0.8485   0.9152   1.1905   0.9039  -(
##
## sigma: 0.242044
## lambda (gene 1): 0.274044
## epsilon (gene 1): 0.899054
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 38320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.853
## delta (gene 1): 10.7571
## s (cell 1): 2.48692
## nu (cell 1): 1.04073
## theta (batch 1): 0.362764
## betas:    1.1280  -0.1745  -0.2386  -0.4469   0.6153   1.2413   0.8391   1.4252   0.5792   1.1337  -(
##
## sigma: 0.265753
## lambda (gene 1): 0.312731
## epsilon (gene 1): 0.873385
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 38360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 549.537
## delta (gene 1): 16.9691
## s (cell 1): 1.0042
## nu (cell 1): 1.02453
## theta (batch 1): 0.0459514
## betas:    1.2738  -0.1493  -0.0445  -0.4872   0.3694   1.5176   0.7768   1.1064   0.7621   0.9115  -(
##
## sigma: 0.260282
## lambda (gene 1): 0.327885
## epsilon (gene 1): 1.36362
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ---------------------------------------------------------
## Iteration 38400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 550.314
## delta (gene 1): 11.2684
## s (cell 1): 1.09998
## nu (cell 1): 1.05306
## theta (batch 1): 0.043928
## betas:    0.8884  -0.1497  -0.9767   0.2124   0.3519   1.2784   1.3394   0.7326   1.5230   0.5043  -(
##
## sigma: 0.262459
## lambda (gene 1): 0.996315
## epsilon (gene 1): 0.959644
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 38440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 552.075
## delta (gene 1): 6.90691
## s (cell 1): 0.818046
## nu (cell 1): 1.05016
## theta (batch 1): 0.0404636
## betas:    0.5151  -0.2101   0.1724  -0.6356   0.6905   1.4082   1.5479   0.9136   1.6140   0.9070   (
##
## sigma: 0.264089
## lambda (gene 1): 0.329079
## epsilon (gene 1): 0.47449
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 38480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 646.5
## delta (gene 1): 10.0316
## s (cell 1): 1.11519
## nu (cell 1): 1.04552
## theta (batch 1): 0.0155983
## betas:    1.7962  -0.2471  -0.0581  -0.7742  -0.2892   1.2362   0.8021   0.9254   0.9377   0.7346  -(
##
## sigma: 0.255019
## lambda (gene 1): 0.920536
## epsilon (gene 1): 0.856002
```

```
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 38520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 658.685
## delta (gene 1): 9.57465
## s (cell 1): 1.09213
## nu (cell 1): 1.08214
## theta (batch 1): 0.00965145
## betas:    0.5321  -0.2352   0.3411  -0.6462   0.3145   1.7679   0.9911   1.4102   1.4096   0.9934   (
##
## sigma: 0.250471
## lambda (gene 1): 0.409585
## epsilon (gene 1): 0.790089
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 38560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 411.24
## delta (gene 1): 6.44176
## s (cell 1): 0.903631
## nu (cell 1): 1.05239
## theta (batch 1): 0.00364138
## betas:    1.1952  -0.1367  -0.2933  -0.1156  -0.0208   1.2557   1.3150   0.4492   1.5146   0.3675  -(
##
## sigma: 0.245087
## lambda (gene 1): 0.13425
## epsilon (gene 1): 0.415692
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 38600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 379.898
## delta (gene 1): 11.6352
## s (cell 1): 1.08255
## nu (cell 1): 1.11693
```

```
## theta (batch 1): 0.00498412
## betas:    1.2066  -0.1690  -0.1166  -0.4689  -0.0857   1.4960   1.1652   0.5331   1.5834   0.4417  -(
##
## sigma: 0.243818
## lambda (gene 1): 1.43121
## epsilon (gene 1): 0.99022
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 38640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 536.901
## delta (gene 1): 8.59015
## s (cell 1): 0.827369
## nu (cell 1): 1.10334
## theta (batch 1): 0.0558816
## betas:    1.2225  -0.2713  -0.6836  -0.9374   0.5406   1.1615   1.2392   0.6604   1.7453   0.5836  -(
##
## sigma: 0.245
## lambda (gene 1): 0.789713
## epsilon (gene 1): 0.699862
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 38680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 519.342
## delta (gene 1): 9.69687
## s (cell 1): 0.990898
## nu (cell 1): 1.09368
## theta (batch 1): 0.0277738
## betas:    1.1223  -0.1056  -0.1555  -0.9328   0.6351   1.1678   1.1131   0.6811   1.4059   0.1317  -(
##
## sigma: 0.260918
## lambda (gene 1): 0.25988
## epsilon (gene 1): 0.799786
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 38720 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 776.758
## delta (gene 1): 8.24063
## s (cell 1): 1.13566
## nu (cell 1): 1.03787
## theta (batch 1): 0.0386137
## betas:    0.9796  -0.1493  -0.8877  -0.2941   0.5884   1.0277   1.3666   0.7996   1.3477   0.5479  -(
##
## sigma: 0.26456
## lambda (gene 1): 0.835293
## epsilon (gene 1): 0.666925
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 38760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 833.946
## delta (gene 1): 11.552
## s (cell 1): 1.13952
## nu (cell 1): 1.11102
## theta (batch 1): 0.00488764
## betas:    0.6582  -0.2000  -0.2255  -0.6586   0.4534   1.5504   1.0291   1.4515   0.9892   1.3249  -(
##
## sigma: 0.246402
## lambda (gene 1): 0.440225
## epsilon (gene 1): 1.00119
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 38800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 566.271
## delta (gene 1): 11.7197
## s (cell 1): 0.952473
## nu (cell 1): 1.06815
## theta (batch 1): 0.00399832
## betas:    0.8669  -0.0485  -0.1035   0.0151   0.1394   1.8702   0.8619   1.0005   1.0742   0.3442  -(
##
## sigma: 0.259142
## lambda (gene 1): 0.282559
## epsilon (gene 1): 1.02648
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 38840 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 642.481
## delta (gene 1): 9.6099
## s (cell 1): 1.11219
## nu (cell 1): 1.07592
## theta (batch 1): 0.00448656
## betas:    1.4657  -0.0691  -0.8762  -0.2406   0.4815   0.9301   1.1492   0.5848   0.8967   0.4314  -(
##
## sigma: 0.249272
## lambda (gene 1): 1.25319
## epsilon (gene 1): 0.806831
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 38880 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 432.113
## delta (gene 1): 9.53403
## s (cell 1): 1.09232
## nu (cell 1): 1.07391
## theta (batch 1): 0.00604798
## betas:    1.4372  -0.1531  -0.4325  -0.6748   0.2804   1.7926   0.1659   1.5254   0.6035   0.5896  -(
##
## sigma: 0.239867
## lambda (gene 1): 0.473068
## epsilon (gene 1): 0.773453
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ------------------------------------------------------
## Iteration 38920 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 327.836
## delta (gene 1): 10.362
## s (cell 1): 1.30781
## nu (cell 1): 1.16669
## theta (batch 1): 0.016078
## betas:    1.4742  -0.1824  -0.3109   0.1376  -0.3532   1.3354   1.2221   0.3741   1.5002   0.4375  -(
```

```
## 
## sigma: 0.261114
## lambda (gene 1): 0.470231
## epsilon (gene 1): 0.878666
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 38960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 428.856
## delta (gene 1): 10.6056
## s (cell 1): 1.48381
## nu (cell 1): 1.0712
## theta (batch 1): 0.0810388
## betas:    0.8006  -0.0965  -0.2907   0.0573   0.8825   1.1407   1.2836   0.9840   0.9298   1.0824  -(
## 
## sigma: 0.252363
## lambda (gene 1): 0.427157
## epsilon (gene 1): 0.909255
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 39000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 315.279
## delta (gene 1): 15.6548
## s (cell 1): 0.879086
## nu (cell 1): 0.99962
## theta (batch 1): 0.0851005
## betas:    1.8621  -0.2556  -0.3339  -0.7152  -0.3065   0.7922   1.6305  -0.0626   1.6230   0.5792  -(
## 
## sigma: 0.252176
## lambda (gene 1): 0.359099
## epsilon (gene 1): 1.28614
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 39040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 545.791
## delta (gene 1): 9.59725
## s (cell 1): 1.04333
## nu (cell 1): 1.0712
## theta (batch 1): 0.0356682
## betas:    0.8109  -0.2646   0.1706  -0.3016   0.1958   1.3615   1.5246   0.7614   1.7429   0.8586
##
## sigma: 0.239322
## lambda (gene 1): 1.02756
## epsilon (gene 1): 0.795819
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 39080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 442.347
## delta (gene 1): 9.57562
## s (cell 1): 1.13508
## nu (cell 1): 1.06408
## theta (batch 1): 0.0571238
## betas:    0.5962  -0.1242   0.2227   0.0521   0.6614   1.1159   1.4242   0.8881   1.4905   0.5994  -0
##
## sigma: 0.25539
## lambda (gene 1): 0.647264
## epsilon (gene 1): 0.793892
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 39120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 593.663
## delta (gene 1): 12.7699
## s (cell 1): 1.06609
## nu (cell 1): 1.11448
## theta (batch 1): 0.0555193
## betas:    1.6222  -0.1636   0.2063  -0.8907   0.9272   0.4055   1.2672   0.7794   0.7140   0.9617  -0
##
## sigma: 0.249504
## lambda (gene 1): 0.504038
## epsilon (gene 1): 1.05159
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 39160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.143
## delta (gene 1): 10.3981
## s (cell 1): 1.52919
## nu (cell 1): 1.03346
## theta (batch 1): 0.0770001
## betas:    1.7961  -0.2491  -0.3126  -0.2865  -0.4778   1.1983   1.0076   0.4208   1.6408   0.0552
##
## sigma: 0.256944
## lambda (gene 1): 1.28325
## epsilon (gene 1): 0.913752
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 39200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.931
## delta (gene 1): 12.8867
## s (cell 1): 1.38972
## nu (cell 1): 1.12888
## theta (batch 1): 0.0366765
## betas:    0.6564  -0.2336   0.3145  -0.1484   0.1831   1.6827   0.8732   1.5352   1.1528   1.2637
##
## sigma: 0.245235
## lambda (gene 1): 0.54762
## epsilon (gene 1): 1.11469
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 39240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 762.548
## delta (gene 1): 12.3527
## s (cell 1): 1.27256
## nu (cell 1): 0.999132
## theta (batch 1): 0.0236751
## betas:    1.7418  -0.1540   0.1951  -0.5276  -0.0342   1.3128   0.8495   0.6800   0.9760   0.4455
##
## sigma: 0.256142
```

```
## lambda (gene 1): 0.6455
## epsilon (gene 1): 1.05254
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 39280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 679.429
## delta (gene 1): 13.5927
## s (cell 1): 0.982092
## nu (cell 1): 1.01612
## theta (batch 1): 0.00659159
## betas:    1.5862  -0.1899  -0.2938  -0.3514   0.3613   1.3935   0.4356   1.1556   0.7623   0.8908  -(
##
## sigma: 0.254342
## lambda (gene 1): 1.20245
## epsilon (gene 1): 1.14037
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 39320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 826.645
## delta (gene 1): 10.2087
## s (cell 1): 1.00819
## nu (cell 1): 1.06951
## theta (batch 1): 0.00623037
## betas:    1.8017  -0.3224  -0.9762  -0.1780  -0.3628   1.2735   0.9899   0.5015   1.7437   0.3246   (
##
## sigma: 0.247968
## lambda (gene 1): 0.873463
## epsilon (gene 1): 0.882804
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## -------------------------------------------------------
## Iteration 39360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 458.223
## delta (gene 1): 11.9277
```

```
## s (cell 1): 1.03637
## nu (cell 1): 1.05327
## theta (batch 1): 0.00372544
## betas:    1.9472  -0.3946  -0.8999  -0.6485  -0.1408   0.7658   1.3529   0.4164   1.6881   0.6707   (
##
## sigma: 0.257136
## lambda (gene 1): 0.233726
## epsilon (gene 1): 1.01718
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 39400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 337.763
## delta (gene 1): 13.6275
## s (cell 1): 0.977182
## nu (cell 1): 1.02364
## theta (batch 1): 0.00425512
## betas:    1.9104  -0.2717  -0.3777  -0.3743  -0.4362   1.3386   0.9008   0.3574   1.7618  -0.0622   (
##
## sigma: 0.264875
## lambda (gene 1): 0.493379
## epsilon (gene 1): 1.15732
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 39440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 724.055
## delta (gene 1): 7.3745
## s (cell 1): 1.00449
## nu (cell 1): 1.07506
## theta (batch 1): 0.00266748
## betas:    2.1810  -0.1987   0.3967  -0.7428  -0.2220   0.8818   0.6921   0.8984   0.3950   1.0058  -
##
## sigma: 0.25879
## lambda (gene 1): 0.34696
## epsilon (gene 1): 0.519612
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
```

```
## ---------------------------------------------------------
## Iteration 39480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 674.947
## delta (gene 1): 10.0717
## s (cell 1): 1.06921
## nu (cell 1): 1.09269
## theta (batch 1): 0.00385828
## betas:    1.5414  -0.2963   0.3659  -0.2574  -0.3599   1.3271   1.3721   0.3414   1.7275   0.6096  -(
##
## sigma: 0.252981
## lambda (gene 1): 1.07366
## epsilon (gene 1): 0.867396
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 39520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 646.93
## delta (gene 1): 11.7135
## s (cell 1): 0.981858
## nu (cell 1): 0.979896
## theta (batch 1): 0.00125744
## betas:    1.1713  -0.2869   0.1159  -0.3709   0.1663   1.4052   0.8899   1.2731   1.2502   0.8416   (
##
## sigma: 0.247937
## lambda (gene 1): 1.0631
## epsilon (gene 1): 1.01521
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 39560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 293.878
## delta (gene 1): 14.5505
## s (cell 1): 0.997156
## nu (cell 1): 1.0356
## theta (batch 1): 0.000589436
## betas:    1.3179  -0.2127  -0.0328  -0.4501   0.0061   1.1708   1.3941   0.4920   1.4988   0.6705  -(
##
## sigma: 0.252137
## lambda (gene 1): 0.476279
## epsilon (gene 1): 1.22886
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 39600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 327.423
## delta (gene 1): 11.6693
## s (cell 1): 1.09366
## nu (cell 1): 1.05183
## theta (batch 1): 0.00107975
## betas:    1.5670  -0.2416  -0.5272  -0.0510  -0.5029   1.0610   1.2780   0.5791   1.3644   0.6562  -(
##
## sigma: 0.250437
## lambda (gene 1): 1.49932
## epsilon (gene 1): 1.01214
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 39640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 558.079
## delta (gene 1): 12.4043
## s (cell 1): 1.11062
## nu (cell 1): 1.09226
## theta (batch 1): 0.00103402
## betas:    1.0720  -0.1298  -0.1747  -0.3775   0.1965   1.8831   0.5401   1.1348   1.2232   0.3278  -(
##
## sigma: 0.253443
## lambda (gene 1): 0.417435
## epsilon (gene 1): 1.07576
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 39680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 626.437
## delta (gene 1): 9.92274
## s (cell 1): 1.06741
## nu (cell 1): 1.07852
```

```
## theta (batch 1): 0.000183296
## betas:    1.0797  -0.1330   0.1606  -0.5407   0.5464   1.3285   1.0422   0.8530   1.2166   0.6550  -(
##
## sigma: 0.246939
## lambda (gene 1): 1.6593
## epsilon (gene 1): 0.842517
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 39720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 592.296
## delta (gene 1): 8.24944
## s (cell 1): 1.0595
## nu (cell 1): 1.06056
## theta (batch 1): 0.00026881
## betas:    1.2110  -0.1258   0.3757  -0.1033   0.1213   1.2393   1.2764   0.5533   1.3015   0.4869  -(
##
## sigma: 0.25651
## lambda (gene 1): 0.659608
## epsilon (gene 1): 0.661763
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 39760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 624.801
## delta (gene 1): 8.99496
## s (cell 1): 1.17278
## nu (cell 1): 1.13834
## theta (batch 1): 0.000451629
## betas:    1.1429  -0.1551   0.0267   0.0813   0.3140   1.0809   1.3085   0.8515   0.9837   0.9785  -(
##
## sigma: 0.264132
## lambda (gene 1): 0.895953
## epsilon (gene 1): 0.719041
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## --------------------------------------------------------
## Iteration 39800 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.314
## delta (gene 1): 7.45689
## s (cell 1): 1.05846
## nu (cell 1): 1.03368
## theta (batch 1): 0.000326627
## betas:    1.1436  -0.3550  -0.4906  -0.9523   0.5129   1.2158   1.3814   0.6986   2.0437   0.5265   (
##
## sigma: 0.24464
## lambda (gene 1): 1.44217
## epsilon (gene 1): 0.577318
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 39840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 1030.6
## delta (gene 1): 9.59774
## s (cell 1): 1.05362
## nu (cell 1): 1.04803
## theta (batch 1): 0.0011053
## betas:    0.8575  -0.2089   0.4296  -0.4532   0.6135   0.8888   1.7071   0.6383   1.5560   0.9098  -(
##
## sigma: 0.246998
## lambda (gene 1): 1.40246
## epsilon (gene 1): 0.827894
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ----------------------------------------------------------
## Iteration 39880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 287.725
## delta (gene 1): 9.11388
## s (cell 1): 1.0595
## nu (cell 1): 1.09103
## theta (batch 1): 0.00449647
## betas:    1.2352  -0.2418  -1.1214   0.1163   0.3071   0.6620   1.5296   0.7617   1.2696   1.0261  -(
##
## sigma: 0.243858
## lambda (gene 1): 0.233884
## epsilon (gene 1): 0.759332
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 39920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.591
## delta (gene 1): 10.4985
## s (cell 1): 1.06546
## nu (cell 1): 1.0489
## theta (batch 1): 0.0266245
## betas:    0.9837  -0.1655  -0.1713   0.0381   0.2557   1.3754   1.0636   0.8571   1.5239   0.3995  -(
##
## sigma: 0.256752
## lambda (gene 1): 0.26724
## epsilon (gene 1): 0.926351
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
## ---------------------------------------------------------
## Iteration 39960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 616.035
## delta (gene 1): 12.2733
## s (cell 1): 1.01705
## nu (cell 1): 1.00391
## theta (batch 1): 0.0527137
## betas:    1.6039  -0.2378  -0.0960  -0.0332  -0.1415   1.1700   0.9020   0.9545   0.9467   0.9987  -(
##
## sigma: 0.248499
## lambda (gene 1): 0.717951
## epsilon (gene 1): 1.05699
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.6
## LStheta (batch 1): -1.6
##
## ---------------------------------------------------------
## ---------------------------------------------------------
## All 40000 MCMC iterations have been completed.
## ---------------------------------------------------------
## ---------------------------------------------------------
##
## ---------------------------------------------------------
## Please see below a summary of the overall acceptance rates.
## ---------------------------------------------------------
```

```
##
## Minimum acceptance rate among mu[i]'s: 0.06285
## Average acceptance rate among mu[i]'s: 0.435446
## Maximum acceptance rate among mu[i]'s: 0.80105
##
##
## Minimum acceptance rate among delta[i]'s: 0.3592
## Average acceptance rate among delta[i]'s: 0.449095
## Maximum acceptance rate among delta[i]'s: 0.54605
##
##
## Minimum acceptance rate among nu[jk]'s: 0.49985
## Average acceptance rate among nu[jk]'s: 0.549871
## Maximum acceptance rate among nu[jk]'s: 0.62485
##
##
## Minimum acceptance rate among theta[k]'s: 0.4617
## Average acceptance rate among theta[k]'s: 0.4617
## Maximum acceptance rate among theta[k]'s: 0.4617
##
##
## -----------------------------------------------------
##

## ----------------------------------------------------------------
## MCMC running time
## ----------------------------------------------------------------
## user: 20432.34
## system: 16587.188
## elapsed: 5233.226

## ----------------------------------------------------------------
## Output
## ----------------------------------------------------------------

## ----------------------------------------------------------------
## BASiCS_Chain object stored as chain_active.Rds file in
## 'rds/' directory ...
## ----------------------------------------------------------------

## ----------------------------------------------------------------
## BASiCS version 2.14.0 : horizontal integration (no-spikes case)
## ----------------------------------------------------------------

## Randomly, 1 out of 1034
## genes was left as reference at each iteration
## List of reference genes and frequencies stored as a .txt file in
## 'rds/' directory ...
## ----------------------------------------------------------------
```

2.2 Inference using BASiCS without spike-ins

Using *BASiCS* without spike-ins is very similar to using it with spike-ins. We will demonstrate using the naive cells. However, first, we must ensure that a `BatchInfo` field is present in the `SingleCellExperiment`

used as input. In this case we use individual of origin as the batch vector.

```r
set.seed(44)
chain_naive_nospikes <- BASiCS_MCMC(
  Data = sce_naive,
  PrintProgress = TRUE,
  N = 40000,
  Thin = 20,
  Burn = 20000,
  Regression = TRUE,
  Threads = 4,
  StoreChains = TRUE,
  StoreDir = "rds/",
  RunName = "naive_nospikes",
  WithSpikes = FALSE
)
```

```
## Warning in .BASiCS_MCMC_InputCheck(Data, N, Thin, Burn, Regression, WithSpikes, : 'Data' should conta
## Please assign the batch information to:
##
##          'colData(Data)$BatchInfo = BatchInfo'.


## Warning in .ChecksBASiCS_Data(Data, WithSpikes): Some genes have zero counts across all cells.
## If comparing 2 groups, use 'PriorDelta = 'log-normal' in BASiCS_MCMC.
## If not, please remove those genes.


## Running no spikes BASiCS sampler (regression case) ...


## ----------------------------------------------------------
## MCMC sampler has been started: 40000 iterations to go.
## ----------------------------------------------------------
## ----------------------------------------------------------
## Iteration 0 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.397
## delta (gene 1): 8.13758
## s (cell 1): 3.27955
## nu (cell 1): 1.01999
## theta (batch 1): 0.850516
## betas:   -0.3665  -0.1196  -1.4009  -0.0085   3.1344  -2.1145  -0.6989   4.6692  -0.2720   0.6195
##
## sigma: 0.489297
## lambda (gene 1): 0.591878
## epsilon (gene 1): -0.295709
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -4
## LSdelta (gene 1): -2
## LSnu (cell 1): -10
## LStheta (batch 1): -4
## ----------------------------------------------------------
## Iteration 40 out of 40000 has been completed.
```

```
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.934
## delta (gene 1): 16.0528
## s (cell 1): 2.26375
## nu (cell 1): 1.07339
## theta (batch 1): 0.174179
## betas:    1.3058  -0.1492  -0.8432   0.1636   0.9820   0.9181   0.7961   1.0245   1.4409   0.0391  -(
##
## sigma: 0.185134
## lambda (gene 1): 1.18045
## epsilon (gene 1): -0.00523406
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -4
## LSdelta (gene 1): -2
## LSnu (cell 1): -10
## LStheta (batch 1): -4
## --------------------------------------------------------
## Iteration 80 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.71
## delta (gene 1): 17.2693
## s (cell 1): 0.747374
## nu (cell 1): 1.11815
## theta (batch 1): 0.0909475
## betas:    1.3186  -0.1612  -0.7740   0.3988   0.9627   0.8263   1.0691   0.9236   1.3087   0.3856  -(
##
## sigma: 0.168681
## lambda (gene 1): 2.81915
## epsilon (gene 1): 0.191859
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -9.9
## LStheta (batch 1): -3.9
## --------------------------------------------------------
## Iteration 120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.719
## delta (gene 1): 17.1225
## s (cell 1): 0.992019
## nu (cell 1): 0.983083
## theta (batch 1): 0.0382389
## betas:    1.2155  -0.2019  -0.0137   0.9007   0.6593   0.8261   1.0377   1.1960   1.3064   0.4104   (
##
## sigma: 0.164276
## lambda (gene 1): 1.50717
## epsilon (gene 1): -0.216536
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -3.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.8
## LStheta (batch 1): -3.8
## -------------------------------------------------------
## Iteration 160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.463
## delta (gene 1): 11.9127
## s (cell 1): 1.05974
## nu (cell 1): 0.986458
## theta (batch 1): 0.0234068
## betas:    1.7366  -0.3207  -0.4837   0.6049   0.2215   0.9861   0.6638   1.3945   1.0430   0.9433  -0
##
## sigma: 0.167322
## lambda (gene 1): 0.797242
## epsilon (gene 1): -0.445305
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.7
## LStheta (batch 1): -3.7
## -------------------------------------------------------
## Iteration 200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 147.91
## delta (gene 1): 18.7951
## s (cell 1): 0.945348
## nu (cell 1): 1.03718
## theta (batch 1): 0.0102055
## betas:    1.7059  -0.2037   0.4301   0.2634   0.2420   1.1016   0.7350   0.9197   1.1456   0.7937  -0
##
## sigma: 0.183343
## lambda (gene 1): 3.06832
## epsilon (gene 1): -0.0727911
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.6
## LStheta (batch 1): -3.6
## -------------------------------------------------------
## Iteration 240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 288.994
## delta (gene 1): 16.1066
## s (cell 1): 1.0513
## nu (cell 1): 1.03761
## theta (batch 1): 0.00612196
## betas:    1.4971  -0.1904  -0.0126   0.4830   0.0690   1.1548   0.7589   1.1238   1.0424   0.8753  -0
```

```
##
## sigma: 0.164585
## lambda (gene 1): 1.22399
## epsilon (gene 1): -0.212122
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.6
## LStheta (batch 1): -3.6
## --------------------------------------------------------
## Iteration 280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 145.554
## delta (gene 1): 12.6654
## s (cell 1): 1.02468
## nu (cell 1): 1.00988
## theta (batch 1): 0.00393568
## betas:    1.3598  -0.0620   0.1248   1.2922  -0.1389   1.1873   0.7885   1.0248   0.8544   0.6836  -(
##
## sigma: 0.162917
## lambda (gene 1): 1.07783
## epsilon (gene 1): -0.0731809
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -9.5
## LStheta (batch 1): -3.5
## --------------------------------------------------------
## Iteration 320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.973
## delta (gene 1): 15.184
## s (cell 1): 1.24475
## nu (cell 1): 1.08514
## theta (batch 1): 0.00441346
## betas:    1.5058  -0.1558  -0.3649   0.2537   0.5855   0.7139   1.1097   0.7090   1.4375   0.3197  -(
##
## sigma: 0.171085
## lambda (gene 1): 1.04708
## epsilon (gene 1): -0.236354
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -9.4
## LStheta (batch 1): -3.4
## --------------------------------------------------------
## Iteration 360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 166.089
## delta (gene 1): 13.3812
## s (cell 1): 1.04416
## nu (cell 1): 1.04906
## theta (batch 1): 0.00498738
## betas:    1.4841  -0.1819   0.3619  -0.1720   0.3893   1.0857   0.5769   1.0417   1.4916   0.3363
##
## sigma: 0.165852
## lambda (gene 1): 1.6895
## epsilon (gene 1): -0.419438
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -9.3
## LStheta (batch 1): -3.3
## ----------------------------------------------------------
## Iteration 400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.538
## delta (gene 1): 16.8492
## s (cell 1): 1.07232
## nu (cell 1): 1.03563
## theta (batch 1): 0.00420766
## betas:    1.4759  -0.0716   0.1348   0.0483   0.7418   0.6633   1.1168   0.5711   1.2056   0.6071  -
##
## sigma: 0.182925
## lambda (gene 1): 0.229698
## epsilon (gene 1): -0.164192
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -9.2
## LStheta (batch 1): -3.2
## ----------------------------------------------------------
## Iteration 440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 275.463
## delta (gene 1): 12.4645
## s (cell 1): 0.987466
## nu (cell 1): 1.01362
## theta (batch 1): 0.0162184
## betas:    0.8620  -0.0528   0.0012   0.6294   0.9100   0.7114   1.2695   0.9944   1.2496   0.7205  -
##
## sigma: 0.155002
## lambda (gene 1): 0.429968
## epsilon (gene 1): -0.420686
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.2
## LSdelta (gene 1): -2.2
```

```
## LSnu (cell 1): -9.2
## LStheta (batch 1): -3.2
## ---------------------------------------------------------
## Iteration 480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.189
## delta (gene 1): 12.6003
## s (cell 1): 1.10012
## nu (cell 1): 1.09671
## theta (batch 1): 0.0279863
## betas:    1.5418  -0.2073  -0.4874  -0.1261   0.2139   1.0833   0.6501   1.1364   1.1670   0.9231  -0
##
## sigma: 0.161428
## lambda (gene 1): 0.885466
## epsilon (gene 1): -0.036426
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -9.1
## LStheta (batch 1): -3.1
## ---------------------------------------------------------
## Iteration 520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.847
## delta (gene 1): 15.501
## s (cell 1): 1.00928
## nu (cell 1): 1.03254
## theta (batch 1): 0.00503881
## betas:    1.1591  -0.0484  -0.0125   0.1383   0.7352   0.6015   1.5414   0.3464   1.5277   0.4035  -0
##
## sigma: 0.165987
## lambda (gene 1): 0.765826
## epsilon (gene 1): 0.08873
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -3
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -9
## LStheta (batch 1): -3
## ---------------------------------------------------------
## Iteration 560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 282.351
## delta (gene 1): 14.3266
## s (cell 1): 1.08128
## nu (cell 1): 1.07321
## theta (batch 1): 0.00246506
## betas:    1.2855  -0.1276  -0.8938  -0.0831   0.8301   0.5744   1.1657   0.9339   1.1001   0.8171  -0
##
## sigma: 0.1659
```

```
## lambda (gene 1): 0.992254
## epsilon (gene 1): -0.0156472
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -8.9
## LStheta (batch 1): -2.9
## -------------------------------------------------------
## Iteration 600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.424
## delta (gene 1): 15.2194
## s (cell 1): 1.21578
## nu (cell 1): 1.08391
## theta (batch 1): 0.0177452
## betas:    1.2972  -0.0627  -0.1633  -0.0050   0.9525   0.5098   1.1306   0.8934   0.9801   0.7340  -(
##
## sigma: 0.181941
## lambda (gene 1): 0.442604
## epsilon (gene 1): -0.250305
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.8
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -8.8
## LStheta (batch 1): -2.8
## -------------------------------------------------------
## Iteration 640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 145.394
## delta (gene 1): 19.3117
## s (cell 1): 0.786537
## nu (cell 1): 1.02727
## theta (batch 1): 0.0249332
## betas:    1.4436  -0.1364  -0.6298   0.4443   0.2720   0.5947   1.2350   0.6456   1.3804   0.6101  -(
##
## sigma: 0.166591
## lambda (gene 1): 1.39347
## epsilon (gene 1): -0.0147493
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.8
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -8.8
## LStheta (batch 1): -2.8
## -------------------------------------------------------
## Iteration 680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.438
## delta (gene 1): 12.8548
```

```
## s (cell 1): 1.03775
## nu (cell 1): 1.07796
## theta (batch 1): 0.0136331
## betas:    1.6919  -0.2627  -0.2026  -0.4168   0.0975   0.9070   0.8219   1.0785   1.1199   1.0692  -(
##
## sigma: 0.167657
## lambda (gene 1): 3.2162
## epsilon (gene 1): -0.0188314
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.7
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -8.7
## LStheta (batch 1): -2.7
## ------------------------------------------------------
## Iteration 720 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.584
## delta (gene 1): 15.3568
## s (cell 1): 1.22419
## nu (cell 1): 1.06709
## theta (batch 1): 0.027648
## betas:    0.8714  -0.1955  -0.0796   0.0594   0.6249   1.0893   0.9293   1.5760   0.9355   1.4905  -(
##
## sigma: 0.163149
## lambda (gene 1): 1.15204
## epsilon (gene 1): -0.000269707
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.6
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -8.6
## LStheta (batch 1): -2.8
## ------------------------------------------------------
## Iteration 760 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.992
## delta (gene 1): 19.4232
## s (cell 1): 1.08485
## nu (cell 1): 1.07195
## theta (batch 1): 0.00934712
## betas:    0.6837  -0.1752   0.1506   0.1372   1.0939   0.7615   1.5734   0.9349   1.5611   1.0821  -(
##
## sigma: 0.173771
## lambda (gene 1): 0.370142
## epsilon (gene 1): 0.465351
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.5
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -8.5
## LStheta (batch 1): -2.9
```

```
## ----------------------------------------------------------
## Iteration 800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.367
## delta (gene 1): 17.2717
## s (cell 1): 0.950664
## nu (cell 1): 0.972609
## theta (batch 1): 0.0124706
## betas:    1.8288  -0.1963   0.0212  -0.0913  -0.0750   1.2880   0.5616   0.8676   1.1149   0.8024  -(
##
## sigma: 0.18766
## lambda (gene 1): 2.1512
## epsilon (gene 1): -0.217586
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -8.4
## LStheta (batch 1): -2.8
## ----------------------------------------------------------
## Iteration 840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.756
## delta (gene 1): 12.087
## s (cell 1): 1.13291
## nu (cell 1): 1.09903
## theta (batch 1): 0.0234823
## betas:    1.1099  -0.1124   0.3628   0.0086   0.3950   1.0800   1.1720   0.7775   1.3804   0.7120  -(
##
## sigma: 0.168189
## lambda (gene 1): 0.476329
## epsilon (gene 1): -0.562595
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -8.4
## LStheta (batch 1): -2.8
## ----------------------------------------------------------
## Iteration 880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 293.44
## delta (gene 1): 16.7182
## s (cell 1): 1.10457
## nu (cell 1): 1.14765
## theta (batch 1): 0.0338558
## betas:    0.9318  -0.1340  -0.6997   0.1761   1.2291   1.2246   0.6501   1.4144   1.1952   0.7395  -(
##
## sigma: 0.17848
## lambda (gene 1): 0.895519
## epsilon (gene 1): 0.334607
```

```
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -8.3
## LStheta (batch 1): -2.7
## ---------------------------------------------------------
## Iteration 920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.731
## delta (gene 1): 14.8394
## s (cell 1): 1.17789
## nu (cell 1): 1.02999
## theta (batch 1): 0.0315898
## betas:    0.7950  -0.1756  -0.3436   0.0296   0.8325   1.4607   0.8829   1.1802   1.5165   1.0130  -(
##
## sigma: 0.172457
## lambda (gene 1): 0.592106
## epsilon (gene 1): 0.317164
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -8.2
## LStheta (batch 1): -2.6
## ---------------------------------------------------------
## Iteration 960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.39
## delta (gene 1): 14.4627
## s (cell 1): 1.0755
## nu (cell 1): 1.03982
## theta (batch 1): 0.0516087
## betas:    0.9801  -0.1090   0.6080   0.0207   0.6366   1.3554   0.9340   0.9162   1.4668   0.6835  -(
##
## sigma: 0.180456
## lambda (gene 1): 1.91559
## epsilon (gene 1): -0.0884202
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -8.1
## LStheta (batch 1): -2.5
## ---------------------------------------------------------
## Iteration 1000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.656
## delta (gene 1): 16.3343
## s (cell 1): 1.25065
## nu (cell 1): 1.18989
```

```
## theta (batch 1): 0.0336701
## betas:    1.4292  -0.1529  -0.0290   0.0443  -0.4983   1.4568   0.9028   0.5574   1.6048   0.6184  -(
##
## sigma: 0.184122
## lambda (gene 1): 1.73629
## epsilon (gene 1): -0.137843
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -2
## LSnu (cell 1): -8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 1040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.555
## delta (gene 1): 13.0094
## s (cell 1): 1.0027
## nu (cell 1): 1.09338
## theta (batch 1): 0.0549133
## betas:    1.3669  -0.1583  -0.1286  -0.8211   0.6758   0.9509   0.7999   0.9124   1.3854   0.7919  -(
##
## sigma: 0.172379
## lambda (gene 1): 1.717
## epsilon (gene 1): -0.34549
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -2
## LSdelta (gene 1): -2
## LSnu (cell 1): -8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 1080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.83
## delta (gene 1): 14.9341
## s (cell 1): 1.06051
## nu (cell 1): 1.01648
## theta (batch 1): 0.0391995
## betas:    0.9578  -0.0682  -0.0650   0.0588   0.6157   1.5170   0.8560   1.0825   0.9801   1.0561  -:
##
## sigma: 0.179094
## lambda (gene 1): 1.11279
## epsilon (gene 1): 0.0338069
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -7.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 1120 out of 40000 has been completed.
```

```
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 309.857
## delta (gene 1): 13.3976
## s (cell 1): 1.16859
## nu (cell 1): 1.04685
## theta (batch 1): 0.0123643
## betas:    1.5760  -0.1351  -0.5827  -0.2890   0.8023   0.9448   0.7181   0.7339   1.3218   0.7025  -(
##
## sigma: 0.173349
## lambda (gene 1): 1.23107
## epsilon (gene 1): 0.216271
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------
## Iteration 1160 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.618
## delta (gene 1): 18.1618
## s (cell 1): 1.0439
## nu (cell 1): 1.14044
## theta (batch 1): 0.00898839
## betas:    1.6149  -0.1441  -0.2883   0.1201  -0.1640   1.1153   0.8513   0.7263   1.3587   0.4801  -(
##
## sigma: 0.179943
## lambda (gene 1): 1.4191
## epsilon (gene 1): 0.27912
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -7.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------
## Iteration 1200 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.138
## delta (gene 1): 17.0371
## s (cell 1): 0.987777
## nu (cell 1): 1.08784
## theta (batch 1): 0.0122645
## betas:    1.0669  -0.1696  -0.2236   0.3313   0.2430   0.9360   1.2938   0.7208   1.5448   0.9792  -(
##
## sigma: 0.194171
## lambda (gene 1): 2.19421
## epsilon (gene 1): -0.16511
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 1240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 129.164
## delta (gene 1): 16.7619
## s (cell 1): 0.865593
## nu (cell 1): 0.965087
## theta (batch 1): 0.00885823
## betas:    1.0793  -0.1238  -0.1578   0.6583   0.5034   0.7680   1.5323   0.4576   1.7126   0.6374  -(
##
## sigma: 0.186583
## lambda (gene 1): 0.623323
## epsilon (gene 1): -0.188903
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 1280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 130.813
## delta (gene 1): 19.4676
## s (cell 1): 0.984727
## nu (cell 1): 1.05794
## theta (batch 1): 0.0240028
## betas:    1.3227  -0.1807   0.0132   0.7419  -0.1032   1.1791   0.9639   0.8689   1.3095   0.8816  -(
##
## sigma: 0.179171
## lambda (gene 1): 1.89793
## epsilon (gene 1): 0.10382
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -7.5
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 1320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.746
## delta (gene 1): 19.1396
## s (cell 1): 0.954302
## nu (cell 1): 1.10397
## theta (batch 1): 0.0197767
## betas:    1.2618  -0.2803   0.0385   0.0496   0.5583   0.9457   1.3060   0.7023   1.8820   0.6013   (
```

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## 
## sigma: 0.177429
## lambda (gene 1): 1.26306
## epsilon (gene 1): 0.335211
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -7.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 1360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.446
## delta (gene 1): 14.1651
## s (cell 1): 0.948539
## nu (cell 1): 1.03942
## theta (batch 1): 0.0235704
## betas:    2.1517  -0.3944  -0.1864  -0.7256   0.6543   0.1180   0.8252   0.8775   1.3934   1.0713  -(
## 
## sigma: 0.182953
## lambda (gene 1): 1.17826
## epsilon (gene 1): 0.159261
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -7.3
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 1400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 141.223
## delta (gene 1): 16.6033
## s (cell 1): 1.2176
## nu (cell 1): 1.06109
## theta (batch 1): 0.0167132
## betas:    1.5397  -0.3056   0.5817   0.3390  -0.7051   1.0162   1.2755   0.6222   1.4584   1.4992  -(
## 
## sigma: 0.197604
## lambda (gene 1): 0.883296
## epsilon (gene 1): -0.308034
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.2
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 1440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 234.076
## delta (gene 1): 12.7596
## s (cell 1): 1.04254
## nu (cell 1): 1.12704
## theta (batch 1): 0.0321803
## betas:     1.1538  -0.2252   0.1177   0.4667   0.0995   1.0282   1.0277   1.2145   1.1116   1.4591  -(
##
## sigma: 0.181051
## lambda (gene 1): 1.3035
## epsilon (gene 1): -0.561253
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -7.2
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 1480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.788
## delta (gene 1): 14.4747
## s (cell 1): 1.18015
## nu (cell 1): 1.01561
## theta (batch 1): 0.0230893
## betas:     1.3714  -0.2195  -0.5810  -0.0400   0.3448   1.0435   0.7879   1.1650   1.1735   1.0269  -(
##
## sigma: 0.175904
## lambda (gene 1): 2.16907
## epsilon (gene 1): 0.0397764
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -7.1
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 1520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.883
## delta (gene 1): 15.0345
## s (cell 1): 0.818243
## nu (cell 1): 1.01251
## theta (batch 1): 0.00931445
## betas:     1.6999  -0.1891  -0.4500   0.1901   0.3669   0.7184   0.9109   0.8991   1.0650   0.8044  -(
##
## sigma: 0.189214
## lambda (gene 1): 1.03384
## epsilon (gene 1): 0.0419715
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
```

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## LSnu (cell 1): -7
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 1560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.407
## delta (gene 1): 15.4854
## s (cell 1): 0.992517
## nu (cell 1): 1.04807
## theta (batch 1): 0.0270047
## betas:    1.3135  -0.1710   0.6630  -0.4754   0.5332   0.9764   1.0869   0.8945   1.2181   0.8490  -(
##
## sigma: 0.179233
## lambda (gene 1): 1.29702
## epsilon (gene 1): -0.196293
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -6.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 1600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.191
## delta (gene 1): 18.6941
## s (cell 1): 1.08681
## nu (cell 1): 1.08292
## theta (batch 1): 0.012086
## betas:    1.8060  -0.1864  -0.8877   0.4275   0.1908   0.5444   0.9756   0.9101   0.7384   1.3309  -
##
## sigma: 0.195333
## lambda (gene 1): 0.693772
## epsilon (gene 1): 0.242662
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 1640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.324
## delta (gene 1): 13.6615
## s (cell 1): 0.922807
## nu (cell 1): 1.02652
## theta (batch 1): 0.00772939
## betas:    1.4654  -0.2480   0.1090   0.0766   0.0799   1.2879   0.4606   1.2935   1.1716   1.1466  -(
##
## sigma: 0.177743
```

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## lambda (gene 1): 2.3358
## epsilon (gene 1): -0.0778598
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 1680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.369
## delta (gene 1): 13.8007
## s (cell 1): 0.902378
## nu (cell 1): 0.981868
## theta (batch 1): 0.00255239
## betas:    1.2640  -0.2390   0.0189   0.1555   0.0020   1.3072   1.0143   0.6655   1.8392   0.7387  -(
##
## sigma: 0.176961
## lambda (gene 1): 1.57251
## epsilon (gene 1): -0.153067
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -6.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 1720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 133.496
## delta (gene 1): 13.8209
## s (cell 1): 0.971107
## nu (cell 1): 1.04897
## theta (batch 1): 0.0118941
## betas:    1.1571  -0.2083   0.3170  -0.2049   0.9563   0.5845   1.2755   0.9578   1.4554   0.9503  -(
##
## sigma: 0.173397
## lambda (gene 1): 0.538795
## epsilon (gene 1): -0.402674
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -6.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 1760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.606
## delta (gene 1): 13.6071
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## s (cell 1): 1.04804
## nu (cell 1): 0.987383
## theta (batch 1): 0.0365232
## betas:    0.9568  -0.1910  -0.1729  -0.3382   0.6659   0.9997   1.3161   0.8911   1.5136   0.9244  -(
##
## sigma: 0.180008
## lambda (gene 1): 1.3863
## epsilon (gene 1): -0.0139917
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -6.5
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 1800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.62
## delta (gene 1): 16.0996
## s (cell 1): 0.72592
## nu (cell 1): 1.0019
## theta (batch 1): 0.0969477
## betas:    0.6961  -0.0605   0.4196   0.2668   0.9352   1.1872   1.2410   0.9222   1.3943   0.7212  -(
##
## sigma: 0.196389
## lambda (gene 1): 1.81139
## epsilon (gene 1): -0.173368
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.4
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 1840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.484
## delta (gene 1): 11.8758
## s (cell 1): 1.00565
## nu (cell 1): 1.12687
## theta (batch 1): 0.114923
## betas:    1.4353  -0.2014  -0.3643   0.0777   0.5621   0.3435   1.3370   0.9476   1.1185   0.9071  -(
##
## sigma: 0.17193
## lambda (gene 1): 0.729272
## epsilon (gene 1): -0.463936
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -6.4
## LStheta (batch 1): -2.4
```

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## ----------------------------------------------------------
## Iteration 1880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 388.793
## delta (gene 1): 13.1144
## s (cell 1): 1.27113
## nu (cell 1): 1.2348
## theta (batch 1): 0.0640559
## betas:    1.2854  -0.1073  -0.2924   0.0840   0.1422   1.3074   0.9631   0.7408   1.4034   0.4617  -(
##
## sigma: 0.182115
## lambda (gene 1): 0.393888
## epsilon (gene 1): -0.432986
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -6.3
## LStheta (batch 1): -2.5
## ----------------------------------------------------------
## Iteration 1920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.995
## delta (gene 1): 16.9638
## s (cell 1): 0.705493
## nu (cell 1): 1.05724
## theta (batch 1): 0.0472185
## betas:    1.8753  -0.2545   0.0663  -0.4188   0.6404   0.6385   0.7059   0.8557   1.3890   0.6204  -(
##
## sigma: 0.180141
## lambda (gene 1): 2.39142
## epsilon (gene 1): 0.0676736
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -6.2
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 1960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.029
## delta (gene 1): 16.0124
## s (cell 1): 1.25547
## nu (cell 1): 1.04255
## theta (batch 1): 0.0508909
## betas:    1.0847  -0.1569   0.1453  -0.0069   0.8984   1.0196   0.9348   0.9769   1.4867   0.7401  -(
##
## sigma: 0.185373
## lambda (gene 1): 1.8674
## epsilon (gene 1): -0.0381654
```

```
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -6.1
## LStheta (batch 1): -2.5
## -------------------------------------------------------
## Iteration 2000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 377.148
## delta (gene 1): 14.5081
## s (cell 1): 0.975219
## nu (cell 1): 1.11744
## theta (batch 1): 0.0265279
## betas:    1.5835  -0.1374   0.1047   0.0269   0.1537   1.1699   0.7492   0.7834   1.1933   0.6481  -(
##
## sigma: 0.200661
## lambda (gene 1): 1.35509
## epsilon (gene 1): 0.321493
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -6
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 2040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.527
## delta (gene 1): 13.007
## s (cell 1): 1.35975
## nu (cell 1): 1.0475
## theta (batch 1): 0.0433794
## betas:    1.3088  -0.2383  -0.1466   0.1121   0.0009   0.6314   1.8826   0.0350   2.1535   0.5736  -(
##
## sigma: 0.183842
## lambda (gene 1): 0.535853
## epsilon (gene 1): 0.207467
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -6
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 2080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.589
## delta (gene 1): 14.9629
## s (cell 1): 0.914277
## nu (cell 1): 0.961811
```

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## theta (batch 1): 0.0283879
## betas:    1.4154  -0.2019  -0.3511   0.0446   0.2802   1.0681   0.9109   0.9212   1.3614   0.8487  -(
##
## sigma: 0.192594
## lambda (gene 1): 0.870343
## epsilon (gene 1): -0.120398
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.9
## LStheta (batch 1): -2.5
## ---------------------------------------------------------
## Iteration 2120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.559
## delta (gene 1): 15.1285
## s (cell 1): 1.29217
## nu (cell 1): 1.00202
## theta (batch 1): 0.0202154
## betas:    1.1754  -0.1082   0.2817  -0.2489   0.6862   1.1785   1.0373   0.7167   1.3644   0.8993  -(
##
## sigma: 0.181838
## lambda (gene 1): 0.730458
## epsilon (gene 1): -0.0322339
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.8
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 2160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 484.517
## delta (gene 1): 13.2205
## s (cell 1): 0.986974
## nu (cell 1): 1.0774
## theta (batch 1): 0.0254237
## betas:    0.9644  -0.1366   0.0738  -0.0465   0.7736   0.8909   1.1164   1.0164   1.3929   0.7903  -(
##
## sigma: 0.182523
## lambda (gene 1): 2.12537
## epsilon (gene 1): 0.0341053
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 2200 out of 40000 has been completed.
```

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## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.654
## delta (gene 1): 17.0932
## s (cell 1): 1.06564
## nu (cell 1): 1.08274
## theta (batch 1): 0.0599516
## betas:    1.3363  -0.1905  -0.3196  -0.3632   0.5385   1.0287   0.7617   1.1467   1.0873   1.1025  -(
##
## sigma: 0.194802
## lambda (gene 1): 1.37156
## epsilon (gene 1): -0.123972
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.6
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 2240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 206.194
## delta (gene 1): 14.1962
## s (cell 1): 1.24235
## nu (cell 1): 1.06714
## theta (batch 1): 0.0592038
## betas:    1.5967  -0.1985  -0.4558  -0.5095   0.4917   0.7246   0.9147   0.8202   1.2668   0.7918  -(
##
## sigma: 0.174717
## lambda (gene 1): 1.23311
## epsilon (gene 1): -0.312213
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.6
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 2280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 281.545
## delta (gene 1): 13.4923
## s (cell 1): 1.17057
## nu (cell 1): 1.08394
## theta (batch 1): 0.0175273
## betas:    1.0353  -0.1598  -0.0376  -0.0499   0.4153   0.8390   1.1339   1.0679   1.3164   0.9390  -(
##
## sigma: 0.187811
## lambda (gene 1): 0.338966
## epsilon (gene 1): -0.0175389
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.5
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 2320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.424
## delta (gene 1): 15.9638
## s (cell 1): 1.10862
## nu (cell 1): 1.14326
## theta (batch 1): 0.0107475
## betas:    0.7959  -0.1106  -0.3187  -0.0233   0.6626   1.1044   1.0663   1.0521   1.3293   1.1498  -(
##
## sigma: 0.182237
## lambda (gene 1): 0.420149
## epsilon (gene 1): 0.189345
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 2360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 268.26
## delta (gene 1): 16.9463
## s (cell 1): 1.27729
## nu (cell 1): 1.14446
## theta (batch 1): 0.00998359
## betas:    0.8601  -0.1236  -0.2060   0.0043   0.7342   1.4331   0.7509   1.3110   1.1390   1.0658  -(
##
## sigma: 0.184931
## lambda (gene 1): 1.35648
## epsilon (gene 1): 0.0785567
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 2400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.914
## delta (gene 1): 12.6431
## s (cell 1): 1.44575
## nu (cell 1): 1.1661
## theta (batch 1): 0.0345049
## betas:    1.4641  -0.1417   0.1519  -0.1789   0.8211   1.0067   0.8731   0.7780   1.3765   0.3193  -(
```

```
## 
## sigma: 0.195916
## lambda (gene 1): 0.747039
## epsilon (gene 1): -0.316454
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 2440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 219.7
## delta (gene 1): 14.6171
## s (cell 1): 1.25506
## nu (cell 1): 1.0375
## theta (batch 1): 0.0441166
## betas:    0.5083  -0.1843  -0.0193  -0.1498   0.8509   1.3712   1.1528   1.1035   1.9128   0.6620
## 
## sigma: 0.193617
## lambda (gene 1): 0.542425
## epsilon (gene 1): -0.157682
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 2480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.68
## delta (gene 1): 18.1675
## s (cell 1): 0.830764
## nu (cell 1): 1.08669
## theta (batch 1): 0.0349094
## betas:    1.0757  -0.1738  -0.2812  -0.4056   1.5728   0.5839   1.0828   1.2632   1.0486   1.1412  -(
## 
## sigma: 0.17617
## lambda (gene 1): 0.553265
## epsilon (gene 1): -0.423641
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 2520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 181.768
## delta (gene 1): 16.468
## s (cell 1): 0.964169
## nu (cell 1): 1.09702
## theta (batch 1): 0.033531
## betas:    1.2942  -0.1897  -0.1808  -0.0600   0.4427   0.7814   1.0143   1.0103   1.2803   0.9818  -0
##
## sigma: 0.194795
## lambda (gene 1): 1.66506
## epsilon (gene 1): -0.157695
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 2560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.749
## delta (gene 1): 12.7379
## s (cell 1): 1.20329
## nu (cell 1): 1.00262
## theta (batch 1): 0.0424079
## betas:    1.4967  -0.1154  -0.1617  -0.2681  -0.1018   1.1926   0.9374   0.7456   1.0696   0.8987  -0
##
## sigma: 0.19309
## lambda (gene 1): 0.405907
## epsilon (gene 1): -0.358041
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 2600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.558
## delta (gene 1): 13.4254
## s (cell 1): 1.05256
## nu (cell 1): 1.16322
## theta (batch 1): 0.0246663
## betas:    0.9983  -0.0756  -0.5507   0.6876   0.8186   0.8944   1.1548   0.8167   1.4063   0.5747  -0
##
## sigma: 0.196978
## lambda (gene 1): 1.13078
## epsilon (gene 1): -0.119288
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 2640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.628
## delta (gene 1): 14.125
## s (cell 1): 1.11952
## nu (cell 1): 1.08057
## theta (batch 1): 0.0297571
## betas:    1.5372  -0.1879   0.3371  -0.9969   0.5553   1.2178   0.4530   0.9922   1.4597   0.4361
##
## sigma: 0.168562
## lambda (gene 1): 1.01569
## epsilon (gene 1): -0.0480815
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 2680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.158
## delta (gene 1): 11.2677
## s (cell 1): 0.964197
## nu (cell 1): 0.989857
## theta (batch 1): 0.0102678
## betas:    1.7737  -0.2474  -0.1807  -0.5797   0.2971   0.8203   0.8944   0.8054   1.2177   0.9719
##
## sigma: 0.179671
## lambda (gene 1): 0.502551
## epsilon (gene 1): -0.466388
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 2720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.222
## delta (gene 1): 12.1292
## s (cell 1): 1.08202
## nu (cell 1): 1.05917
## theta (batch 1): 0.0107281
## betas:    1.5519  -0.0947  -0.2638  -0.0457   0.8107   0.6963   0.9650   0.7135   0.9776   1.0208
##
## sigma: 0.188861
```

```
## lambda (gene 1): 2.01177
## epsilon (gene 1): -0.30478
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 2760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.031
## delta (gene 1): 14.5497
## s (cell 1): 1.01854
## nu (cell 1): 1.10139
## theta (batch 1): 0.00852363
## betas:    1.6445  -0.2526  -0.3114  -0.7654   0.4433   0.4843   1.2595   0.6366   1.4607   0.9095  -(
##
## sigma: 0.181535
## lambda (gene 1): 1.04738
## epsilon (gene 1): -0.333023
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 2800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 337.379
## delta (gene 1): 15.2662
## s (cell 1): 1.05698
## nu (cell 1): 1.12441
## theta (batch 1): 0.00628669
## betas:    1.5380  -0.1871  -0.4841   0.1643   0.5498   0.5440   1.0589   0.8396   1.2882   0.6551  -(
##
## sigma: 0.195314
## lambda (gene 1): 0.705675
## epsilon (gene 1): 0.256689
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 2840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 140.643
## delta (gene 1): 14.5573
```

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## s (cell 1): 1.03598
## nu (cell 1): 0.994227
## theta (batch 1): 0.0072445
## betas:    1.2851  -0.2894   0.2425   0.0802   0.2859   1.0386   0.9865   0.9465   1.7751   0.6813
##
## sigma: 0.183877
## lambda (gene 1): 1.31377
## epsilon (gene 1): 0.218944
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 2880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.888
## delta (gene 1): 14.0676
## s (cell 1): 1.20418
## nu (cell 1): 1.08427
## theta (batch 1): 0.0110231
## betas:    1.0969  -0.1247  -0.1626   0.3411   0.5381   1.2314   0.5979   1.5156   0.7754   1.0894
##
## sigma: 0.189282
## lambda (gene 1): 1.14961
## epsilon (gene 1): -0.00169371
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 2920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.163
## delta (gene 1): 15.6199
## s (cell 1): 1.05157
## nu (cell 1): 1.07402
## theta (batch 1): 0.00777104
## betas:    1.6553  -0.0832  -0.5488  -0.1251   0.1525   1.0660   0.9222   0.5209   1.2273   0.5605
##
## sigma: 0.183901
## lambda (gene 1): 1.16348
## epsilon (gene 1): 0.102776
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
```

```
## --------------------------------------------------------
## Iteration 2960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.211
## delta (gene 1): 12.7149
## s (cell 1): 1.3352
## nu (cell 1): 1.15007
## theta (batch 1): 0.00541672
## betas:    0.8636  -0.0668   0.0779   0.1388   1.1972   1.0062   0.9847   1.1023   1.1917   0.8715  -(
##
## sigma: 0.199068
## lambda (gene 1): 0.131527
## epsilon (gene 1): -0.014048
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 3000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 360
## delta (gene 1): 16.2769
## s (cell 1): 1.03482
## nu (cell 1): 1.03504
## theta (batch 1): 0.00584302
## betas:    1.2940  -0.0226   0.2896  -0.1829   0.6920   1.0326   0.8303   0.6926   1.3275   0.2966  -(
##
## sigma: 0.193321
## lambda (gene 1): 1.62468
## epsilon (gene 1): 0.351127
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 3040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.069
## delta (gene 1): 16.4887
## s (cell 1): 1.13037
## nu (cell 1): 1.13093
## theta (batch 1): 0.00658969
## betas:    1.7116  -0.2967  -1.4782  -0.5069   0.1473   0.7151   1.0047   0.8398   1.2154   1.4170  -(
##
## sigma: 0.183309
## lambda (gene 1): 0.309135
## epsilon (gene 1): 0.367647
```

```
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 3080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 393.412
## delta (gene 1): 16.3001
## s (cell 1): 0.892288
## nu (cell 1): 0.959206
## theta (batch 1): 0.00291672
## betas:    0.8894  -0.1190  -0.3279  -0.1830   0.7741   1.2906   1.2706   0.5383   1.7397   0.9290  -
##
## sigma: 0.192831
## lambda (gene 1): 0.629575
## epsilon (gene 1): 0.152887
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 3120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.978
## delta (gene 1): 13.8833
## s (cell 1): 0.972155
## nu (cell 1): 1.00172
## theta (batch 1): 0.0050039
## betas:    1.1901  -0.1024   0.4739  -0.6239   0.8150   0.9959   0.9691   0.9403   1.0836   1.1016  -
##
## sigma: 0.185262
## lambda (gene 1): 0.638924
## epsilon (gene 1): -0.305878
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 3160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.151
## delta (gene 1): 12.4504
## s (cell 1): 1.06713
## nu (cell 1): 1.09769
```

```
## theta (batch 1): 0.00672523
## betas:    1.3585  -0.1792   0.5992  -0.4806   0.4332   0.7341   0.9501   0.9581   1.2371   0.9461  -(
##
## sigma: 0.182738
## lambda (gene 1): 1.82436
## epsilon (gene 1): 0.0280895
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -----------------------------------------------------------
## Iteration 3200 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 165.945
## delta (gene 1): 13.2794
## s (cell 1): 1.19992
## nu (cell 1): 1.09673
## theta (batch 1): 0.00712696
## betas:    1.6332  -0.1874  -0.2650  -0.1759   0.5412   0.6302   1.0019   0.7974   1.1818   0.8793  -(
##
## sigma: 0.19671
## lambda (gene 1): 1.44376
## epsilon (gene 1): -0.320334
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 3240 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.046
## delta (gene 1): 14.1727
## s (cell 1): 1.11978
## nu (cell 1): 1.08496
## theta (batch 1): 0.00369045
## betas:    0.9794  -0.1856   0.1814  -0.4923   0.8969   0.6857   1.4700   0.6178   1.8318   0.8429  -(
##
## sigma: 0.182232
## lambda (gene 1): 1.10247
## epsilon (gene 1): -0.239389
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 3280 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.622
## delta (gene 1): 19.1035
## s (cell 1): 1.10076
## nu (cell 1): 1.12105
## theta (batch 1): 0.000785019
## betas:    0.9542  -0.0644   0.6107   0.5050   0.7334   0.9089   1.3733   0.6147   1.5180   0.5526  -(
##
## sigma: 0.179721
## lambda (gene 1): 0.724046
## epsilon (gene 1): -0.0239515
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 3320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.486
## delta (gene 1): 19.3347
## s (cell 1): 1.00764
## nu (cell 1): 1.03151
## theta (batch 1): 0.000942848
## betas:    1.7427  -0.1962   0.1760   0.1828  -0.0101   0.8531   1.0069   0.7846   0.9962   1.2005  -:
##
## sigma: 0.183229
## lambda (gene 1): 1.09367
## epsilon (gene 1): -0.00485329
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 3360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.933
## delta (gene 1): 18.4888
## s (cell 1): 1.0899
## nu (cell 1): 1.11041
## theta (batch 1): 0.00312883
## betas:    1.3926  -0.1530   0.5256  -0.0325   0.2632   1.2894   0.7376   0.7026   1.6319   0.5813  -(
##
## sigma: 0.187029
## lambda (gene 1): 1.70628
## epsilon (gene 1): 0.0570705
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 3400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.348
## delta (gene 1): 18.4934
## s (cell 1): 1.00016
## nu (cell 1): 1.01089
## theta (batch 1): 0.00310759
## betas:    1.3604  -0.1711   0.4983  -0.1385   0.4183   1.3814   0.5036   1.0122   1.3545   0.7949  -(
##
## sigma: 0.194977
## lambda (gene 1): 1.15082
## epsilon (gene 1): -0.034712
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 3440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 166.147
## delta (gene 1): 17.8914
## s (cell 1): 1.09246
## nu (cell 1): 1.03395
## theta (batch 1): 0.00745765
## betas:    1.3564  -0.1644   0.3914  -0.3198   0.2967   0.8362   1.2518   0.5525   1.5581   0.7031  -(
##
## sigma: 0.200753
## lambda (gene 1): 1.06741
## epsilon (gene 1): -0.0498117
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 3480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 280.516
## delta (gene 1): 13.4136
## s (cell 1): 1.12965
## nu (cell 1): 1.04051
## theta (batch 1): 0.00513568
## betas:    1.6906  -0.1274   0.1318  -0.5651   0.7701   0.7189   0.8826   0.8219   1.0341   0.6291  -(
```

```
## 
## sigma: 0.185647
## lambda (gene 1): 2.87542
## epsilon (gene 1): 0.0109532
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 3520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 405.535
## delta (gene 1): 12.9997
## s (cell 1): 1.23508
## nu (cell 1): 1.08623
## theta (batch 1): 0.0233381
## betas:    1.7543  -0.1360  -0.0936  -0.0349   0.3910   0.4657   1.4371   0.1344   1.4772   0.5443  -(
## 
## sigma: 0.194268
## lambda (gene 1): 0.636508
## epsilon (gene 1): -0.262322
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 3560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.624
## delta (gene 1): 10.0759
## s (cell 1): 1.20099
## nu (cell 1): 1.17967
## theta (batch 1): 0.011801
## betas:    1.5067  -0.0739   0.1739   0.3515   0.4241   0.5917   1.1497   0.5689   1.1556   0.7702  -(
## 
## sigma: 0.178219
## lambda (gene 1): 1.18815
## epsilon (gene 1): -0.160814
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 3600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 102.086
## delta (gene 1): 13.9074
## s (cell 1): 1.13568
## nu (cell 1): 1.10479
## theta (batch 1): 0.00465336
## betas:     1.4927  -0.2169   0.3954  -0.1698  -0.0307   1.0484   1.0839   0.5490   1.5158   0.9997  -(
##
## sigma: 0.201882
## lambda (gene 1): 0.192163
## epsilon (gene 1): -0.645401
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 3640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.017
## delta (gene 1): 18.2465
## s (cell 1): 1.1669
## nu (cell 1): 1.13103
## theta (batch 1): 0.00241848
## betas:     1.5760  -0.1478  -0.1882  -0.0375   0.3695   0.9263   0.8053   0.8364   1.0823   1.0143  -(
##
## sigma: 0.186178
## lambda (gene 1): 0.915822
## epsilon (gene 1): -0.377229
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 3680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.527
## delta (gene 1): 17.1731
## s (cell 1): 1.17743
## nu (cell 1): 1.14742
## theta (batch 1): 0.00271648
## betas:     1.2808  -0.1486   0.1845   0.1424   0.4927   0.6506   1.2399   0.7484   1.3022   0.9519  -(
##
## sigma: 0.195131
## lambda (gene 1): 1.33588
## epsilon (gene 1): 0.0396645
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.5
## LSdelta (gene 1): -1.7
```

```
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 3720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 313.459
## delta (gene 1): 12.2479
## s (cell 1): 0.968149
## nu (cell 1): 1.00282
## theta (batch 1): 0.0121449
## betas:    1.0894  -0.0809  -0.4143   0.4114   0.5164   1.2532   0.7872   0.9251   1.3140   0.7451  -(
##
## sigma: 0.189806
## lambda (gene 1): 0.624433
## epsilon (gene 1): -0.705278
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 3760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 134.098
## delta (gene 1): 12.8024
## s (cell 1): 1.19362
## nu (cell 1): 1.03994
## theta (batch 1): 0.0505466
## betas:    1.3112  -0.0442   0.3877   0.1523   0.4396   1.0446   1.1977   0.4955   1.2841   0.4149  -(
##
## sigma: 0.18866
## lambda (gene 1): 1.15972
## epsilon (gene 1): -0.582891
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 3800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.183
## delta (gene 1): 15.5358
## s (cell 1): 1.2896
## nu (cell 1): 1.05588
## theta (batch 1): 0.01827
## betas:    1.9393  -0.1682  -0.1718  -0.2829   0.5001   0.4471   1.0661   0.4225   1.2736   0.5538  -(
##
## sigma: 0.202234
```

```
## lambda (gene 1): 1.14228
## epsilon (gene 1): -0.0708883
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 3840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.894
## delta (gene 1): 15.903
## s (cell 1): 0.937602
## nu (cell 1): 1.03723
## theta (batch 1): 0.0242681
## betas:    1.0353  -0.1232   0.9498   0.9614   0.0273   1.0965   1.0016   1.1646   1.0925   1.0115  -(
##
## sigma: 0.174637
## lambda (gene 1): 2.368
## epsilon (gene 1): -0.0382929
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 3880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.504
## delta (gene 1): 13.791
## s (cell 1): 1.07508
## nu (cell 1): 1.10592
## theta (batch 1): 0.0253748
## betas:    1.8502  -0.1706   0.3410  -0.8105   0.7010   0.8204   0.7368   0.7798   0.9756   1.0124  -
##
## sigma: 0.201039
## lambda (gene 1): 0.307149
## epsilon (gene 1): -0.222474
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 3920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.275
## delta (gene 1): 12.5959
```

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## s (cell 1): 1.02829
## nu (cell 1): 1.08524
## theta (batch 1): 0.0378342
## betas:    1.0136  -0.1731  -0.0961   0.0900   0.5366   1.4617   0.6683   1.3402   1.2120   1.0735  -(
##
## sigma: 0.183885
## lambda (gene 1): 0.446799
## epsilon (gene 1): 0.196384
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 3960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 354.843
## delta (gene 1): 14.0776
## s (cell 1): 0.828702
## nu (cell 1): 1.13585
## theta (batch 1): 0.0509991
## betas:    1.9617  -0.1690  -0.7810  -0.4606   0.3707   1.2211   0.3774   0.8539   0.9565   0.8437  -(
##
## sigma: 0.201304
## lambda (gene 1): 0.740125
## epsilon (gene 1): -0.391803
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 4000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.427
## delta (gene 1): 15.5773
## s (cell 1): 1.29503
## nu (cell 1): 1.0914
## theta (batch 1): 0.102238
## betas:    1.0289  -0.1536   0.4163  -0.5077   0.4122   1.2729   1.0432   0.9473   1.2029   1.3904  -(
##
## sigma: 0.194228
## lambda (gene 1): 1.43664
## epsilon (gene 1): -0.0831335
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
```

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## ----------------------------------------------------------
## Iteration 4040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 426.747
## delta (gene 1): 16.158
## s (cell 1): 0.831758
## nu (cell 1): 1.07022
## theta (batch 1): 0.0233995
## betas:    1.0402  -0.0787   0.3748  -0.0774   0.1877   1.4993   0.9544   0.7912   1.2557   1.0913  -
##
## sigma: 0.186347
## lambda (gene 1): 1.0947
## epsilon (gene 1): -0.0446623
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 4080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.542
## delta (gene 1): 16.6644
## s (cell 1): 1.1228
## nu (cell 1): 1.06722
## theta (batch 1): 0.0126494
## betas:    1.4575  -0.0868  -0.7461  -0.3216   1.0089   1.0154   0.9012   0.6417   1.2582   0.6251  -
##
## sigma: 0.19183
## lambda (gene 1): 0.645843
## epsilon (gene 1): -0.0998161
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 4120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.666
## delta (gene 1): 13.4251
## s (cell 1): 1.24835
## nu (cell 1): 1.02982
## theta (batch 1): 0.00897795
## betas:    1.5636  -0.1549  -0.1643  -0.2948   0.4900   1.0194   0.6255   1.0624   1.2223   0.2869  -
##
## sigma: 0.189382
## lambda (gene 1): 0.505464
## epsilon (gene 1): -0.0839747
```

```
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 4160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 259.563
## delta (gene 1): 15.2778
## s (cell 1): 1.09639
## nu (cell 1): 1.12654
## theta (batch 1): 0.0183235
## betas:    1.6938  -0.2302  -0.3415  -0.2497   0.3055   0.8756   0.6757   1.1084   0.9341   1.3171  -(
##
## sigma: 0.187869
## lambda (gene 1): 0.647762
## epsilon (gene 1): -0.0349142
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ------------------------------------------------------
## Iteration 4200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 349.291
## delta (gene 1): 13.2153
## s (cell 1): 1.16646
## nu (cell 1): 1.02613
## theta (batch 1): 0.00531897
## betas:    1.6124  -0.1768   0.2888   0.2541   0.3493   0.6026   0.8760   0.9719   0.9334   1.1630  -(
##
## sigma: 0.200196
## lambda (gene 1): 1.7158
## epsilon (gene 1): 0.135068
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 4240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.064
## delta (gene 1): 15.8452
## s (cell 1): 1.17428
## nu (cell 1): 1.08099
```

```
## theta (batch 1): 0.00243656
## betas:    1.4856  -0.2235  -0.3881   0.2776   0.7946   0.5294   0.6575   1.3152   0.9876   1.1819  -
##
## sigma: 0.177031
## lambda (gene 1): 0.808437
## epsilon (gene 1): 0.332804
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 4280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.523
## delta (gene 1): 12.8308
## s (cell 1): 1.19808
## nu (cell 1): 1.08486
## theta (batch 1): 0.00748556
## betas:    1.5839  -0.2898   0.7026   0.0876   0.3169   0.7994   0.7735   1.3286   0.9041   1.4650  -
##
## sigma: 0.18058
## lambda (gene 1): 1.53707
## epsilon (gene 1): -0.126739
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 4320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.251
## delta (gene 1): 17.4847
## s (cell 1): 1.07862
## nu (cell 1): 1.06294
## theta (batch 1): 0.00549592
## betas:    1.7286  -0.1416   0.4352   0.0239   0.5405   0.7377   0.7342   0.9942   0.8520   0.7725  -
##
## sigma: 0.183474
## lambda (gene 1): 0.897671
## epsilon (gene 1): -0.157195
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 4360 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.506
## delta (gene 1): 13.4922
## s (cell 1): 0.942498
## nu (cell 1): 1.0204
## theta (batch 1): 0.00945021
## betas:    1.5002  -0.2577  -0.1141   0.0415   0.3148   0.9021   1.1203   0.6236   1.8686   0.4000
##
## sigma: 0.180463
## lambda (gene 1): 0.678677
## epsilon (gene 1): -0.190964
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 4400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.824
## delta (gene 1): 13.7429
## s (cell 1): 0.927271
## nu (cell 1): 0.993439
## theta (batch 1): 0.0197649
## betas:    1.2654  -0.1479   0.2903  -0.2035   0.4398   1.2314   0.7859   0.8693   1.3209   1.0587  -(
##
## sigma: 0.19261
## lambda (gene 1): 0.742959
## epsilon (gene 1): -0.0707318
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 4440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.733
## delta (gene 1): 12.2695
## s (cell 1): 0.96409
## nu (cell 1): 1.08856
## theta (batch 1): 0.00888877
## betas:    1.3890  -0.1764  -0.5499   0.0724   0.0243   1.1753   0.9349   0.5348   1.6679   0.8408  -(
##
## sigma: 0.189617
## lambda (gene 1): 0.77067
## epsilon (gene 1): -0.179876
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 4480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.648
## delta (gene 1): 18.552
## s (cell 1): 0.734858
## nu (cell 1): 0.936696
## theta (batch 1): 0.0324172
## betas:    1.1835  -0.1770   0.1962   0.7196   0.0989   1.0775   0.9102   1.0483   1.3326   0.9656  -(
##
## sigma: 0.189604
## lambda (gene 1): 0.123803
## epsilon (gene 1): 0.109294
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 4520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.811
## delta (gene 1): 19.7039
## s (cell 1): 1.19021
## nu (cell 1): 1.0594
## theta (batch 1): 0.048105
## betas:    1.1692  -0.1712   0.0598   0.4489   0.6338   0.8829   1.0422   0.9607   1.4445   0.6885  -(
##
## sigma: 0.176507
## lambda (gene 1): 0.93531
## epsilon (gene 1): 0.274606
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 4560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.261
## delta (gene 1): 18.8675
## s (cell 1): 1.18673
## nu (cell 1): 1.05309
## theta (batch 1): 0.0094623
## betas:    1.0650  -0.1591  -0.0145   0.0405   0.7634   1.3522   0.7392   0.9447   1.7356   0.3580   (
```

```
## 
## sigma: 0.178034
## lambda (gene 1): 1.53441
## epsilon (gene 1): 0.263038
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 4600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 332.67
## delta (gene 1): 15.0154
## s (cell 1): 1.02374
## nu (cell 1): 1.13479
## theta (batch 1): 0.0260105
## betas:    1.4828  -0.2026  -0.8454   0.0339   0.3343   0.8975   1.1454   0.5178   1.6582   0.6620  -0
## 
## sigma: 0.195444
## lambda (gene 1): 1.04304
## epsilon (gene 1): -0.18056
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 4640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.794
## delta (gene 1): 14.5691
## s (cell 1): 1.17259
## nu (cell 1): 1.08944
## theta (batch 1): 0.0244161
## betas:    1.1684  -0.1162   0.1377  -0.1960   0.9594   1.1607   0.7336   1.1269   1.1403   0.8451  -0
## 
## sigma: 0.178308
## lambda (gene 1): 0.660588
## epsilon (gene 1): -0.20064
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 4680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 177.651
## delta (gene 1): 16.3818
## s (cell 1): 0.975355
## nu (cell 1): 1.04014
## theta (batch 1): 0.0285737
## betas:    0.6250  -0.1241  -0.2348   0.7153   0.9614   1.1484   1.1914   1.1082   1.4994   0.7434  -(
##
## sigma: 0.18193
## lambda (gene 1): 1.65613
## epsilon (gene 1): 0.0518294
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 4720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.504
## delta (gene 1): 23.8933
## s (cell 1): 0.844935
## nu (cell 1): 1.03261
## theta (batch 1): 0.0537492
## betas:    1.8183  -0.2517  -0.3755  -0.1893   0.3554   0.4946   1.0253   0.7561   1.2440   0.9364  -(
##
## sigma: 0.189359
## lambda (gene 1): 0.153301
## epsilon (gene 1): 0.122521
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 4760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.488
## delta (gene 1): 11.5868
## s (cell 1): 1.00413
## nu (cell 1): 0.991207
## theta (batch 1): 0.036199
## betas:    1.8083  -0.1638   0.2315   0.4129  -0.0050   0.9130   0.6571   0.9334   0.9817   0.7388  -(
##
## sigma: 0.18222
## lambda (gene 1): 0.525621
## epsilon (gene 1): 0.131433
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
```

```
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 4800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 439.95
## delta (gene 1): 16.5776
## s (cell 1): 1.05933
## nu (cell 1): 1.08169
## theta (batch 1): 0.0201319
## betas:    1.6633  -0.2206  -0.9410  -0.0686   0.1406   1.2990   0.5333   0.9966   1.1797   0.9352  -(
##
## sigma: 0.204109
## lambda (gene 1): 0.62651
## epsilon (gene 1): 0.560325
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 4840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 318.652
## delta (gene 1): 12.4836
## s (cell 1): 1.18878
## nu (cell 1): 0.94082
## theta (batch 1): 0.0354307
## betas:    1.0057  -0.2111  -0.3088   0.1645   1.2351   0.6020   1.1958   1.0190   1.6332   0.7157   (
##
## sigma: 0.182288
## lambda (gene 1): 2.82758
## epsilon (gene 1): 0.30904
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 4880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.236
## delta (gene 1): 13.1016
## s (cell 1): 1.3366
## nu (cell 1): 1.09086
## theta (batch 1): 0.0328728
## betas:    1.2452  -0.1079  -0.0570  -0.3198   0.9752   0.9897   0.8151   1.0549   1.1038   0.6923  -(
##
## sigma: 0.18041
```

```
## lambda (gene 1): 1.77874
## epsilon (gene 1): -0.118375
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 4920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 288.491
## delta (gene 1): 18.9904
## s (cell 1): 1.2437
## nu (cell 1): 1.05648
## theta (batch 1): 0.0241493
## betas:    1.8178  -0.1449  -0.7387  -0.0629   0.4857   0.6630   0.8201   0.6399   1.2456   0.5541   -
##
## sigma: 0.179171
## lambda (gene 1): 1.41705
## epsilon (gene 1): 0.304253
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 4960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 247.63
## delta (gene 1): 13.4332
## s (cell 1): 1.3918
## nu (cell 1): 1.15132
## theta (batch 1): 0.0215576
## betas:    0.8521  -0.1742  -0.0841   0.3897   0.2618   1.3662   0.9853   0.9744   1.8077   0.4826   (
##
## sigma: 0.183066
## lambda (gene 1): 0.888956
## epsilon (gene 1): -0.413735
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 5000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 350.577
## delta (gene 1): 11.6546
```

```
## s (cell 1): 1.04215
## nu (cell 1): 1.07695
## theta (batch 1): 0.0333876
## betas:    1.0808  -0.0371  -0.3075   0.6509   0.2805   1.5228   0.6569   1.0177   1.1021   0.8231  -
##
## sigma: 0.195655
## lambda (gene 1): 0.488895
## epsilon (gene 1): 0.0640852
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 5040 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.647
## delta (gene 1): 14.4132
## s (cell 1): 1.27632
## nu (cell 1): 1.12373
## theta (batch 1): 0.0462602
## betas:    2.0013  -0.1781  -0.6899  -0.0705   0.1644   0.7604   0.7925   0.6241   1.1180   0.6856  -
##
## sigma: 0.172456
## lambda (gene 1): 1.0584
## epsilon (gene 1): 0.273431
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 5080 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.779
## delta (gene 1): 12.9983
## s (cell 1): 0.700649
## nu (cell 1): 1.14421
## theta (batch 1): 0.0389527
## betas:    1.1466  -0.1468  -0.0775   0.0522   0.8134   1.1603   0.6331   1.2804   1.1677   0.8883  -
##
## sigma: 0.181282
## lambda (gene 1): 1.31038
## epsilon (gene 1): -0.378826
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
```

```
## ----------------------------------------------------------
## Iteration 5120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.235
## delta (gene 1): 11.9469
## s (cell 1): 1.00687
## nu (cell 1): 1.00706
## theta (batch 1): 0.0286374
## betas:    1.2088  -0.1387   0.4455   0.4161   0.6818   1.1442   0.6763   1.0645   1.3210   0.8883  -(
##
## sigma: 0.176602
## lambda (gene 1): 1.26181
## epsilon (gene 1): -0.134436
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 5160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 296.993
## delta (gene 1): 16.316
## s (cell 1): 0.95836
## nu (cell 1): 1.09247
## theta (batch 1): 0.0166728
## betas:    1.1655  -0.1643   0.2310   0.1832   0.0419   1.3621   0.9189   0.9425   1.4325   0.7693  -(
##
## sigma: 0.180825
## lambda (gene 1): 0.961901
## epsilon (gene 1): -0.0251357
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 5200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.342
## delta (gene 1): 18.6693
## s (cell 1): 1.86052
## nu (cell 1): 1.06805
## theta (batch 1): 0.0491851
## betas:    1.0632  -0.1247  -0.6603   0.9509   0.0926   1.5414   0.7201   1.1346   1.1236   0.9748  -(
##
## sigma: 0.196385
## lambda (gene 1): 0.840093
## epsilon (gene 1): 0.335506
```

```
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 5240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.421
## delta (gene 1): 11.9559
## s (cell 1): 1.425
## nu (cell 1): 1.12672
## theta (batch 1): 0.0719207
## betas:    1.2917  -0.1311   0.1962   0.3728   0.4277   0.8931   1.2519   0.5008   1.6026   0.5767  -(
##
## sigma: 0.18784
## lambda (gene 1): 1.39087
## epsilon (gene 1): -0.0842915
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ------------------------------------------------------
## Iteration 5280 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 259.053
## delta (gene 1): 11.1978
## s (cell 1): 1.1361
## nu (cell 1): 1.15688
## theta (batch 1): 0.0307774
## betas:    1.4470  -0.1760   0.4691  -0.2278   0.7986   0.9235   0.8706   0.9356   1.3172   0.6073  -(
##
## sigma: 0.190221
## lambda (gene 1): 0.540835
## epsilon (gene 1): -0.506251
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ------------------------------------------------------
## Iteration 5320 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.821
## delta (gene 1): 12.7165
## s (cell 1): 0.84154
## nu (cell 1): 1.0854
```

```
## theta (batch 1): 0.0196594
## betas:    1.3400  -0.1317   0.0075   0.6876   0.3738   0.9882   0.8817   0.9167   1.2050   0.8694  -0
##
## sigma: 0.174473
## lambda (gene 1): 1.40169
## epsilon (gene 1): -0.0929256
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 5360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.624
## delta (gene 1): 16.2061
## s (cell 1): 0.857368
## nu (cell 1): 1.01197
## theta (batch 1): 0.0212473
## betas:    0.9426  -0.1438  -0.3938   0.1690   0.3292   1.4673   0.8645   1.0527   1.4395   0.8879  -0
##
## sigma: 0.182371
## lambda (gene 1): 1.28729
## epsilon (gene 1): -0.213676
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## ----------------------------------------------------------
## Iteration 5400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.644
## delta (gene 1): 12.9191
## s (cell 1): 1.1913
## nu (cell 1): 1.15336
## theta (batch 1): 0.0138399
## betas:    1.0991  -0.2944  -0.6000  -0.2602   0.2821   1.3111   0.9391   1.1397   1.6325   1.0297   0
##
## sigma: 0.2018
## lambda (gene 1): 0.786585
## epsilon (gene 1): -0.208215
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 5440 out of 40000 has been completed.
```

```
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.457
## delta (gene 1): 14.0383
## s (cell 1): 0.892984
## nu (cell 1): 1.0446
## theta (batch 1): 0.0302794
## betas:    1.0854  -0.1337   0.2286   0.2984   0.1541   1.5239   1.0322   0.6031   1.7425   0.4784  -(
##
## sigma: 0.19364
## lambda (gene 1): 1.29566
## epsilon (gene 1): -0.134815
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ----------------------------------------------------
## Iteration 5480 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.012
## delta (gene 1): 13.5473
## s (cell 1): 0.962936
## nu (cell 1): 1.0583
## theta (batch 1): 0.0233183
## betas:    1.3762  -0.2038   0.4811  -0.3414   0.5641   1.0849   0.6688   1.1422   1.3451   0.6590  -(
##
## sigma: 0.173143
## lambda (gene 1): 1.3731
## epsilon (gene 1): -0.416865
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------
## Iteration 5520 out of 40000 has been completed.
## ----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 275.03
## delta (gene 1): 22.2267
## s (cell 1): 1.09979
## nu (cell 1): 1.11786
## theta (batch 1): 0.0100452
## betas:    1.4103  -0.1709  -0.3849   0.3670   0.2194   1.2368   0.7564   1.0027   1.2086   0.6948  -(
##
## sigma: 0.178094
## lambda (gene 1): 0.972369
## epsilon (gene 1): 0.244896
## ----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 5560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 254.324
## delta (gene 1): 21.6669
## s (cell 1): 0.945054
## nu (cell 1): 0.982595
## theta (batch 1): 0.010481
## betas:    1.5277  -0.0214  -0.1085  -0.2138   0.2707   1.1568   1.0010   0.3168   1.4263   0.1863  -
##
## sigma: 0.179919
## lambda (gene 1): 1.842
## epsilon (gene 1): 0.196348
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 5600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 161.082
## delta (gene 1): 10.9786
## s (cell 1): 0.944608
## nu (cell 1): 1.04601
## theta (batch 1): 0.00674346
## betas:    1.1241  -0.0653  -0.2465   0.8135   0.5425   0.7574   1.4515   0.4188   1.5100   0.6845  -
##
## sigma: 0.194372
## lambda (gene 1): 1.81739
## epsilon (gene 1): -0.641372
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 5640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.728
## delta (gene 1): 15.5486
## s (cell 1): 1.03255
## nu (cell 1): 1.0549
## theta (batch 1): 0.00110125
## betas:    1.2046  -0.0872  -0.6807   0.1945   1.1964   0.3804   1.2559   0.8979   0.9693   1.0785  -
```

```
## 
## sigma: 0.177201
## lambda (gene 1): 1.00329
## epsilon (gene 1): -0.261988
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 5680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.289
## delta (gene 1): 16.0603
## s (cell 1): 1.03319
## nu (cell 1): 1.08866
## theta (batch 1): 0.00117559
## betas:    1.0402  -0.0601  -0.1547   0.1817   1.1858   0.8608   1.1987   0.7034   1.3029   0.6899  -(
## 
## sigma: 0.19832
## lambda (gene 1): 1.23951
## epsilon (gene 1): -0.182811
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 5720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.957
## delta (gene 1): 22.055
## s (cell 1): 1.0335
## nu (cell 1): 1.05363
## theta (batch 1): 0.00257843
## betas:    1.3377  -0.0401  -0.3653   0.6660   0.6688   0.7272   0.8115   1.0286   0.8156   0.8098  -1
## 
## sigma: 0.186145
## lambda (gene 1): 0.374125
## epsilon (gene 1): 0.0706351
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 5760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 249.115
## delta (gene 1): 15.6103
## s (cell 1): 1.10549
## nu (cell 1): 1.08719
## theta (batch 1): 0.00296733
## betas:    1.3784  -0.1682  -0.5527   0.2446   0.0627   1.1859   0.8363   0.8465   1.3879   0.8608  -(
##
## sigma: 0.179885
## lambda (gene 1): 0.410249
## epsilon (gene 1): -0.371781
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 5800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 133.049
## delta (gene 1): 12.0704
## s (cell 1): 1.08757
## nu (cell 1): 1.07666
## theta (batch 1): 0.00439239
## betas:    1.5626  -0.2600  -0.0822  -0.4719   0.5558   0.9777   0.8250   0.9395   1.2847   1.2182  -(
##
## sigma: 0.208741
## lambda (gene 1): 1.15859
## epsilon (gene 1): -0.675008
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 5840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.666
## delta (gene 1): 20.1432
## s (cell 1): 0.820337
## nu (cell 1): 1.13349
## theta (batch 1): 0.0216348
## betas:    1.5050  -0.1721  -0.4287   0.4755   0.2872   1.0528   0.8948   0.6269   1.6174   0.3720  -(
##
## sigma: 0.180867
## lambda (gene 1): 1.68716
## epsilon (gene 1): -0.146907
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
```

```
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 5880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.098
## delta (gene 1): 11.5039
## s (cell 1): 0.925379
## nu (cell 1): 1.12997
## theta (batch 1): 0.024666
## betas:    1.0098  -0.1416  -0.4297   0.5600   0.7350   1.0088   1.1835   0.7843   1.4842   0.9818  -(
##
## sigma: 0.182533
## lambda (gene 1): 1.58393
## epsilon (gene 1): -0.266571
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 5920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 324.501
## delta (gene 1): 10.8993
## s (cell 1): 1.06513
## nu (cell 1): 1.07193
## theta (batch 1): 0.0206547
## betas:    1.2291  -0.3006   0.0777  -0.2469   1.0716   0.8523   0.8865   1.1834   1.6493   0.8828  -(
##
## sigma: 0.185319
## lambda (gene 1): 0.884068
## epsilon (gene 1): -0.565057
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 5960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.106
## delta (gene 1): 16.2054
## s (cell 1): 1.059
## nu (cell 1): 1.07043
## theta (batch 1): 0.0386516
## betas:    0.9532  -0.1672   0.3309   0.4755   0.7802   0.7482   1.1910   1.0625   1.3761   1.0241  -(
##
## sigma: 0.194224
```

```
## lambda (gene 1): 1.7498
## epsilon (gene 1): -0.07563
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 6000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 433.69
## delta (gene 1): 12.9158
## s (cell 1): 0.94859
## nu (cell 1): 1.0559
## theta (batch 1): 0.013275
## betas:    1.7062  -0.1925  -0.1625   0.0778   0.3311   0.7043   0.8003   1.0344   0.9225   0.9691   -
##
## sigma: 0.195261
## lambda (gene 1): 1.04111
## epsilon (gene 1): -0.256527
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 6040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.192
## delta (gene 1): 17.5209
## s (cell 1): 1.01918
## nu (cell 1): 1.07855
## theta (batch 1): 0.00793997
## betas:    1.5819  -0.1798   0.0262   0.1315   0.3822   0.4020   1.5329   0.4703   1.2237   1.0551   -
##
## sigma: 0.181446
## lambda (gene 1): 1.78653
## epsilon (gene 1): 0.0271042
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 6080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.883
## delta (gene 1): 14.6454
```

```
## s (cell 1): 1.19026
## nu (cell 1): 1.02747
## theta (batch 1): 0.015315
## betas:    1.7822  -0.2399  -0.4374   0.3199  -0.1592   1.0581   0.7045   0.8139   1.4192   0.6084  -(
##
## sigma: 0.191798
## lambda (gene 1): 0.165106
## epsilon (gene 1): -0.0243122
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 6120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.961
## delta (gene 1): 16.3383
## s (cell 1): 1.65668
## nu (cell 1): 1.10711
## theta (batch 1): 0.0456805
## betas:    1.1033  -0.1318  -0.4806   0.1951   0.4815   1.2865   0.7878   1.1952   1.1259   0.8395  -(
##
## sigma: 0.191025
## lambda (gene 1): 1.44227
## epsilon (gene 1): -0.145505
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 6160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.453
## delta (gene 1): 11.4353
## s (cell 1): 1.63022
## nu (cell 1): 1.13476
## theta (batch 1): 0.0227954
## betas:    1.5042  -0.2330  -0.2895   0.3677   0.0926   1.0470   0.7736   0.8398   1.6382   0.5124   (
##
## sigma: 0.184395
## lambda (gene 1): 0.513284
## epsilon (gene 1): -0.285808
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
```

```
## ----------------------------------------------------------
## Iteration 6200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 241.457
## delta (gene 1): 14.3157
## s (cell 1): 1.24797
## nu (cell 1): 1.12016
## theta (batch 1): 0.0158219
## betas:    1.2526  -0.0934  -0.2327   0.3286   0.8364   0.7462   1.1852   0.6138   1.4094   0.5624  -(
##
## sigma: 0.195855
## lambda (gene 1): 0.978294
## epsilon (gene 1): -0.111981
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 6240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 312.596
## delta (gene 1): 12.0078
## s (cell 1): 1.10041
## nu (cell 1): 1.10117
## theta (batch 1): 0.00571518
## betas:    1.1279  -0.1827  -0.1036   0.3081   0.3134   1.2772   0.6844   1.1860   1.4680   0.5762   (
##
## sigma: 0.181679
## lambda (gene 1): 2.45773
## epsilon (gene 1): -0.247365
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 6280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.575
## delta (gene 1): 12.3226
## s (cell 1): 1.11183
## nu (cell 1): 1.10302
## theta (batch 1): 0.001874
## betas:    1.1327  -0.1286   0.3404   0.0562   0.8594   1.0732   0.8504   0.9780   1.4946   0.3548  -(
##
## sigma: 0.179814
## lambda (gene 1): 1.45573
## epsilon (gene 1): -0.622106
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 6320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.853
## delta (gene 1): 19.8062
## s (cell 1): 0.927973
## nu (cell 1): 1.02847
## theta (batch 1): 0.0115387
## betas:    1.4704  -0.2455   0.0615  -0.3195   0.6849   0.8696   0.7556   1.2220   1.1792   1.0456  -(
##
## sigma: 0.178435
## lambda (gene 1): 1.18576
## epsilon (gene 1): 0.317224
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 6360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.257
## delta (gene 1): 20.2699
## s (cell 1): 0.972653
## nu (cell 1): 1.01557
## theta (batch 1): 0.0160333
## betas:    1.3304  -0.1950   0.4775  -0.1731   0.9526   0.7660   0.9680   1.0140   1.3681   0.6645  -(
##
## sigma: 0.188242
## lambda (gene 1): 1.06511
## epsilon (gene 1): 0.0808092
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 6400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.968
## delta (gene 1): 21.3144
## s (cell 1): 1.05705
## nu (cell 1): 1.05977
```

```
## theta (batch 1): 0.021393
## betas:     1.6670  -0.1508   1.0390  -0.2484   0.1134   1.2605   0.5761   0.8743   1.1965   0.5331  -(
##
## sigma: 0.201526
## lambda (gene 1): 0.431204
## epsilon (gene 1): 0.202358
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 6440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.404
## delta (gene 1): 12.1437
## s (cell 1): 1.05011
## nu (cell 1): 1.13364
## theta (batch 1): 0.00748259
## betas:     1.7398  -0.1758   0.1317   0.0888  -0.2354   1.1395   0.6236   0.8779   1.2580   0.4670  -(
##
## sigma: 0.1764
## lambda (gene 1): 1.59891
## epsilon (gene 1): -0.334438
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 6480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.368
## delta (gene 1): 13.7997
## s (cell 1): 1.1016
## nu (cell 1): 1.07965
## theta (batch 1): 0.0075633
## betas:     2.0325  -0.2083  -0.0173  -0.6124   0.0543   1.1361   0.3340   0.7793   1.3094   0.6711  -(
##
## sigma: 0.183782
## lambda (gene 1): 1.35775
## epsilon (gene 1): -0.302654
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 6520 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 377.409
## delta (gene 1): 14.6274
## s (cell 1): 1.09384
## nu (cell 1): 1.08541
## theta (batch 1): 0.0140365
## betas:    1.3426  -0.2296  -0.7438   0.1122   0.6910   1.0687   0.6448   1.1583   1.5204   0.5675   (
##
## sigma: 0.175944
## lambda (gene 1): 1.11618
## epsilon (gene 1): -0.368472
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 6560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.78
## delta (gene 1): 15.2454
## s (cell 1): 1.28691
## nu (cell 1): 1.16787
## theta (batch 1): 0.00392961
## betas:    1.1130  -0.1017  -0.0604   0.1089   0.3766   1.2876   0.8272   0.9031   1.4011   0.5803  -(
##
## sigma: 0.180777
## lambda (gene 1): 0.745997
## epsilon (gene 1): -0.289564
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 6600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.904
## delta (gene 1): 25.1612
## s (cell 1): 1.0968
## nu (cell 1): 1.10579
## theta (batch 1): 0.0208317
## betas:    1.1871  -0.0992   0.6228   0.2717  -0.2216   0.9689   1.4190   0.4656   1.5520   0.6114  -(
##
## sigma: 0.193226
## lambda (gene 1): 1.37664
## epsilon (gene 1): 0.355535
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 6640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.545
## delta (gene 1): 10.8204
## s (cell 1): 1.37436
## nu (cell 1): 1.12473
## theta (batch 1): 0.0168512
## betas:    0.9700  -0.0052   0.4198   0.3728   0.5723   1.3252   1.0849   0.6628   1.3071   0.7597  -
##
## sigma: 0.179172
## lambda (gene 1): 0.446752
## epsilon (gene 1): -0.503581
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 6680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.973
## delta (gene 1): 15.4339
## s (cell 1): 0.950803
## nu (cell 1): 1.14122
## theta (batch 1): 0.0488414
## betas:    1.5266  -0.1548  -0.5003  -0.5227   0.9069   0.8957   0.7980   0.7919   1.4233   0.3875  -
##
## sigma: 0.182322
## lambda (gene 1): 1.44505
## epsilon (gene 1): 0.117351
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 6720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.577
## delta (gene 1): 14.4233
## s (cell 1): 1.11446
## nu (cell 1): 1.09879
## theta (batch 1): 0.016111
## betas:    1.7302  -0.3114  -0.5340  -0.7016   0.6031   0.8488   0.5650   1.5402   0.6671   1.5913  -
```

```
##
## sigma: 0.175393
## lambda (gene 1): 1.00178
## epsilon (gene 1): -0.0466417
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 6760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 247.162
## delta (gene 1): 15.231
## s (cell 1): 0.982659
## nu (cell 1): 1.02257
## theta (batch 1): 0.0297284
## betas:    1.1696  -0.1042   0.3495  -0.3972   0.6735   1.0241   1.1692   0.6802   1.3650   0.8639  -
##
## sigma: 0.182305
## lambda (gene 1): 0.896436
## epsilon (gene 1): 0.040634
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 6800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.722
## delta (gene 1): 18.6458
## s (cell 1): 0.993595
## nu (cell 1): 1.18245
## theta (batch 1): 0.0772025
## betas:    1.1502  -0.0410   0.0535  -0.5326   0.6408   1.5238   0.7233   0.6710   1.5073   0.3794  -
##
## sigma: 0.188845
## lambda (gene 1): 0.347765
## epsilon (gene 1): 0.0227606
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 6840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 165.479
## delta (gene 1): 11.742
## s (cell 1): 1.09643
## nu (cell 1): 0.981069
## theta (batch 1): 0.035286
## betas:    1.3763  -0.0833  -0.6372  -0.1901   0.9525   1.0161   0.8977   0.5806   1.5185   0.3344  -(
##
## sigma: 0.178459
## lambda (gene 1): 0.486499
## epsilon (gene 1): -0.433234
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 6880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.993
## delta (gene 1): 14.7421
## s (cell 1): 1.01028
## nu (cell 1): 1.07157
## theta (batch 1): 0.00869783
## betas:    0.6023  -0.1086  -0.0500  -0.1179   0.8547   1.4073   0.9936   1.0514   1.7565   0.6221   (
##
## sigma: 0.177805
## lambda (gene 1): 0.30949
## epsilon (gene 1): -0.394909
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 6920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.889
## delta (gene 1): 16.1865
## s (cell 1): 1.57943
## nu (cell 1): 1.06655
## theta (batch 1): 0.0442929
## betas:    1.4395  -0.1612   0.1602  -0.2078   0.5640   0.9322   1.0192   0.6949   1.3838   0.8363  -(
##
## sigma: 0.183891
## lambda (gene 1): 1.03533
## epsilon (gene 1): 0.00723538
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 6960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.968
## delta (gene 1): 13.3159
## s (cell 1): 0.958317
## nu (cell 1): 1.08457
## theta (batch 1): 0.0273769
## betas:    0.8468  -0.0707   0.1215   0.3528   0.8031   0.8008   1.3749   0.8025   1.3828   0.7808  -(
##
## sigma: 0.185828
## lambda (gene 1): 0.920826
## epsilon (gene 1): -0.166061
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 7000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.692
## delta (gene 1): 14.1596
## s (cell 1): 0.894376
## nu (cell 1): 1.04932
## theta (batch 1): 0.0513818
## betas:    1.2192  -0.1988   0.6627  -0.0727   0.3012   1.0636   1.1593   0.8301   1.4632   0.8607  -(
##
## sigma: 0.199613
## lambda (gene 1): 0.48909
## epsilon (gene 1): -0.0114136
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 7040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.374
## delta (gene 1): 18.0299
## s (cell 1): 0.832597
## nu (cell 1): 1.05251
## theta (batch 1): 0.0231587
## betas:    1.2699  -0.2626  -0.5072   0.3598   0.1789   1.2160   0.9489   0.9926   1.5544   0.9168  -(
##
## sigma: 0.183616
```

```
## lambda (gene 1): 1.60695
## epsilon (gene 1): 0.254674
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 7080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 219.96
## delta (gene 1): 13.2217
## s (cell 1): 1.27819
## nu (cell 1): 1.05641
## theta (batch 1): 0.00672096
## betas:    0.5090  -0.1542   0.0140   0.2243   0.9174   1.3563   1.0848   1.0972   1.6656   1.2167  -(
##
## sigma: 0.189315
## lambda (gene 1): 0.632519
## epsilon (gene 1): -0.361688
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 7120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.871
## delta (gene 1): 15.2206
## s (cell 1): 1.07793
## nu (cell 1): 1.08408
## theta (batch 1): 0.0116124
## betas:    1.5796  -0.2481   0.0077  -0.0249  -0.2599   0.7337   1.3949   0.5645   1.4049   1.0431  -(
##
## sigma: 0.191608
## lambda (gene 1): 2.10081
## epsilon (gene 1): -0.0331055
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 7160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.242
## delta (gene 1): 13.5987
```

```
## s (cell 1): 1.19872
## nu (cell 1): 1.13916
## theta (batch 1): 0.0084898
## betas:    1.1705  -0.1366  -0.3669   0.6773   0.8118   0.4470   1.3462   0.7325   1.4249   0.7988  -(
##
## sigma: 0.174985
## lambda (gene 1): 0.898425
## epsilon (gene 1): -0.0443168
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 7200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.505
## delta (gene 1): 13.4678
## s (cell 1): 1.09751
## nu (cell 1): 1.06741
## theta (batch 1): 0.00348341
## betas:    1.0976  -0.1054  -0.3151   0.2476   0.1784   1.4091   0.9524   0.8260   1.4165   0.6426  -(
##
## sigma: 0.191771
## lambda (gene 1): 1.38558
## epsilon (gene 1): -0.211506
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 7240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.995
## delta (gene 1): 14.4539
## s (cell 1): 1.12414
## nu (cell 1): 1.13389
## theta (batch 1): 0.00566406
## betas:    1.1394  -0.1714  -1.3360  -0.9619   0.6673   1.2031   0.8716   1.2541   0.9439   1.3701  -(
##
## sigma: 0.179349
## lambda (gene 1): 1.60783
## epsilon (gene 1): -0.106866
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
```

```
## ---------------------------------------------------------
## Iteration 7280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.857
## delta (gene 1): 16.91
## s (cell 1): 1.37571
## nu (cell 1): 1.10197
## theta (batch 1): 0.026463
## betas:    1.0918    0.0461   -0.1667   -0.0861    0.8894    1.1916    0.9099    0.5390    1.4719    0.0703   -
##
## sigma: 0.180788
## lambda (gene 1): 1.23457
## epsilon (gene 1): 0.0270878
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 7320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.551
## delta (gene 1): 12.0241
## s (cell 1): 1.24598
## nu (cell 1): 1.04414
## theta (batch 1): 0.0227154
## betas:    1.2906   -0.1567    0.2023   -0.2402    0.1761    1.1008    1.2723    0.4642    1.6771    0.6345   -
##
## sigma: 0.182057
## lambda (gene 1): 0.170124
## epsilon (gene 1): -0.401301
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 7360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.917
## delta (gene 1): 17.2549
## s (cell 1): 1.16712
## nu (cell 1): 1.01089
## theta (batch 1): 0.00709245
## betas:    1.3728   -0.2216   -0.1679    0.2026    0.0089    0.9704    1.0912    0.8444    1.4796    0.8513   -
##
## sigma: 0.185055
## lambda (gene 1): 2.72294
## epsilon (gene 1): 0.12672
```

```
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 7400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.942
## delta (gene 1): 19.6382
## s (cell 1): 1.1669
## nu (cell 1): 1.1205
## theta (batch 1): 0.0367332
## betas:    1.3462  -0.2675  -0.1822   0.0879   0.3809   0.8852   1.3246   0.5836   1.7697   0.8324  -(
##
## sigma: 0.200914
## lambda (gene 1): 1.03172
## epsilon (gene 1): -0.0379212
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 7440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.823
## delta (gene 1): 14.4293
## s (cell 1): 1.18748
## nu (cell 1): 1.07685
## theta (batch 1): 0.0140536
## betas:    1.9645  -0.2181  -0.0919   0.0683   0.2207   0.7005   0.9525   0.5108   1.4808   0.3441  -(
##
## sigma: 0.181763
## lambda (gene 1): 1.70428
## epsilon (gene 1): -0.319108
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 7480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.913
## delta (gene 1): 17.5131
## s (cell 1): 0.993093
## nu (cell 1): 1.07255
```

```
## theta (batch 1): 0.00806088
## betas:    1.5175  -0.2141   0.3706  -0.7366   1.0411   0.6560   1.0496   0.6867   1.5465   0.7310  -(
##
## sigma: 0.18749
## lambda (gene 1): 1.26346
## epsilon (gene 1): 0.00363693
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 7520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 271.695
## delta (gene 1): 11.1234
## s (cell 1): 1.11738
## nu (cell 1): 1.01152
## theta (batch 1): 0.0215035
## betas:    1.0663  -0.1138   0.0633   0.4027   0.4779   1.0112   1.1147   0.8523   1.3612   0.7435  -(
##
## sigma: 0.186717
## lambda (gene 1): 0.873166
## epsilon (gene 1): -0.352296
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 7560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 153.417
## delta (gene 1): 11.4
## s (cell 1): 1.07514
## nu (cell 1): 1.07151
## theta (batch 1): 0.0260581
## betas:    2.0549  -0.2023   0.0327  -0.5432   0.4957   0.8686   0.5573   0.7690   1.1824   0.3577  -(
##
## sigma: 0.183497
## lambda (gene 1): 0.521481
## epsilon (gene 1): -0.410711
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 7600 out of 40000 has been completed.
```

```
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 268.26
## delta (gene 1): 13.9178
## s (cell 1): 1.12599
## nu (cell 1): 1.05218
## theta (batch 1): 0.0173954
## betas:    1.2019  -0.2064  -0.1140  -0.1274   0.3062   1.4498   0.6296   1.1482   1.3844   0.9875  -(
##
## sigma: 0.192388
## lambda (gene 1): 1.83831
## epsilon (gene 1): -0.0251184
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 7640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 279.931
## delta (gene 1): 11.5679
## s (cell 1): 1.10659
## nu (cell 1): 1.07787
## theta (batch 1): 0.00606886
## betas:    1.6342  -0.3015   0.1446  -0.8729   0.4788   0.5059   1.1956   0.6982   1.6028   0.8415   (
##
## sigma: 0.181517
## lambda (gene 1): 1.81109
## epsilon (gene 1): -0.210977
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 7680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.758
## delta (gene 1): 15.3548
## s (cell 1): 1.0487
## nu (cell 1): 1.06235
## theta (batch 1): 0.0166273
## betas:    1.3328  -0.1830  -0.0288   0.3067   0.3554   0.9446   1.1381   0.7458   1.4919   0.6475  -(
##
## sigma: 0.179609
## lambda (gene 1): 0.682699
## epsilon (gene 1): -0.220247
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 7720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.571
## delta (gene 1): 19.1778
## s (cell 1): 1.17312
## nu (cell 1): 1.09054
## theta (batch 1): 0.0290178
## betas:    1.2643  -0.2827   0.0072  -0.2575   0.6095   0.8058   1.1049   0.9225   1.7226   0.8393   (
##
## sigma: 0.182289
## lambda (gene 1): 0.958155
## epsilon (gene 1): 0.21874
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 7760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.007
## delta (gene 1): 16.3091
## s (cell 1): 1.04735
## nu (cell 1): 1.03243
## theta (batch 1): 0.0230757
## betas:    1.2209  -0.2370  -0.1298  -0.4301   0.1889   1.3938   0.5737   1.4864   0.9918   1.3482  -(
##
## sigma: 0.176478
## lambda (gene 1): 0.785076
## epsilon (gene 1): -0.0725493
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 7800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.368
## delta (gene 1): 15.8558
## s (cell 1): 1.41965
## nu (cell 1): 1.07651
## theta (batch 1): 0.00842347
## betas:    2.0189  -0.1868   0.2643   0.2457  -0.0581   0.7218   0.7938   0.6553   0.9899   1.0295  -(
```

```
## 
## sigma: 0.204768
## lambda (gene 1): 3.32194
## epsilon (gene 1): 0.0344955
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 7840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 247.946
## delta (gene 1): 13.0602
## s (cell 1): 0.95398
## nu (cell 1): 1.03167
## theta (batch 1): 0.0102705
## betas:    1.8817  -0.2445  -0.2750  -0.6182  -0.2304   0.9372   0.7073   0.8649   1.1488   1.0304  -(
## 
## sigma: 0.191986
## lambda (gene 1): 0.581643
## epsilon (gene 1): -0.117241
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 7880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.064
## delta (gene 1): 13.3626
## s (cell 1): 0.924334
## nu (cell 1): 1.04376
## theta (batch 1): 0.00726431
## betas:    1.1430  -0.1537  -0.1433  -0.0485  -0.0208   1.3818   1.0094   0.8225   1.4596   0.8609  -(
## 
## sigma: 0.186927
## lambda (gene 1): 1.57289
## epsilon (gene 1): -0.133014
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 7920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 211.144
## delta (gene 1): 16.0543
## s (cell 1): 1.05224
## nu (cell 1): 1.11038
## theta (batch 1): 0.00445635
## betas:    1.8379  -0.1086  -0.2682  -0.5505   1.3749   0.1778   1.0098   0.6242   1.0544   0.5049  -(
##
## sigma: 0.192967
## lambda (gene 1): 1.19228
## epsilon (gene 1): 0.118787
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 7960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 193.064
## delta (gene 1): 14.7111
## s (cell 1): 1.07222
## nu (cell 1): 1.04622
## theta (batch 1): 0.00263587
## betas:    1.4742  -0.1667   0.0924  -0.0259  -0.3218   1.4845   0.5139   1.1520   1.1081   0.7820  -(
##
## sigma: 0.196896
## lambda (gene 1): 0.221947
## epsilon (gene 1): -0.267479
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 8000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 124.396
## delta (gene 1): 15.4986
## s (cell 1): 1.10771
## nu (cell 1): 1.00433
## theta (batch 1): 0.00300355
## betas:    1.3835  -0.1503  -0.3142   0.4868   0.3951   0.8666   1.1048   0.7767   1.2220   0.8602  -(
##
## sigma: 0.201615
## lambda (gene 1): 1.02367
## epsilon (gene 1): -0.320578
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
```

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## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 8040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.186
## delta (gene 1): 17.0683
## s (cell 1): 1.13936
## nu (cell 1): 1.06317
## theta (batch 1): 0.00136797
## betas:    1.9363  -0.2248   0.1631  -0.2041   0.0997   1.0878   0.6041   0.8282   1.2494   0.5819  -
##
## sigma: 0.191409
## lambda (gene 1): 0.77811
## epsilon (gene 1): -0.199183
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 8080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 301.487
## delta (gene 1): 16.6765
## s (cell 1): 1.04596
## nu (cell 1): 1.09272
## theta (batch 1): 0.00101171
## betas:    1.1257  -0.0695   0.3964   0.5434  -0.2840   1.4293   0.7057   0.9986   1.3341   0.6299  -
##
## sigma: 0.18307
## lambda (gene 1): 0.689356
## epsilon (gene 1): 0.0537957
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 8120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 117.739
## delta (gene 1): 16.6758
## s (cell 1): 1.23355
## nu (cell 1): 1.19451
## theta (batch 1): 0.00150333
## betas:    9.0021e-01  -2.4568e-01   3.3765e-01   8.7961e-02   2.5365e-01   1.1402e+00   9.5926e-01
##
## sigma: 0.185049
```

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## lambda (gene 1): 1.83388
## epsilon (gene 1): 0.0888712
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 8160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.408
## delta (gene 1): 16.0713
## s (cell 1): 1.0523
## nu (cell 1): 1.06938
## theta (batch 1): 0.00185228
## betas:    1.2894  -0.1135   0.1937   0.3849  -0.1249   1.4804   0.7928   0.7019   1.5819   0.4080  -(
##
## sigma: 0.183696
## lambda (gene 1): 1.00583
## epsilon (gene 1): -0.306126
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 8200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 355.528
## delta (gene 1): 19.2969
## s (cell 1): 0.957112
## nu (cell 1): 0.957514
## theta (batch 1): 0.00101662
## betas:    1.4398  -0.0624  -0.4602  -0.1247   0.9132   0.8459   0.7959   0.8765   0.8965   0.8972  -
##
## sigma: 0.195045
## lambda (gene 1): 0.373629
## epsilon (gene 1): 0.54574
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 8240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.164
## delta (gene 1): 13.1043
```

```
## s (cell 1): 0.966897
## nu (cell 1): 1.04715
## theta (batch 1): 0.00396952
## betas:    1.0047  -0.0870   0.2393  -0.3889   1.0117   1.1766   0.6777   1.4055   0.8554   1.0632  -(
##
## sigma: 0.171328
## lambda (gene 1): 1.34739
## epsilon (gene 1): 0.161255
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 8280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.729
## delta (gene 1): 16.4263
## s (cell 1): 1.0563
## nu (cell 1): 1.04492
## theta (batch 1): 0.007263
## betas:    0.8439  -0.0451   0.5832   0.1965   0.5651   1.3411   1.2778   0.5886   1.5563   0.4687  -(
##
## sigma: 0.181661
## lambda (gene 1): 1.03937
## epsilon (gene 1): -0.477228
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 8320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.977
## delta (gene 1): 16.0222
## s (cell 1): 1.07056
## nu (cell 1): 1.05459
## theta (batch 1): 0.00583933
## betas:    1.8608  -0.1275  -0.2301  -0.0435   0.2142   0.9414   0.6148   0.7257   1.1349   0.4031  -(
##
## sigma: 0.18775
## lambda (gene 1): 0.75274
## epsilon (gene 1): -0.32576
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2
```

```
## ---------------------------------------------------------
## Iteration 8360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 305.815
## delta (gene 1): 14.3718
## s (cell 1): 1.15007
## nu (cell 1): 1.07719
## theta (batch 1): 0.00851541
## betas:    1.6115  -0.1496  -0.4793  -0.2902   0.4762   1.0392   0.7726   0.7312   1.3864   0.4005  -(
##
## sigma: 0.171923
## lambda (gene 1): 0.431419
## epsilon (gene 1): 0.250419
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 8400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.821
## delta (gene 1): 12.6315
## s (cell 1): 1.26332
## nu (cell 1): 1.02232
## theta (batch 1): 0.00677927
## betas:    1.0804  -0.1108   0.4043  -0.1710   0.7424   1.2727   0.6632   1.2200   1.1394   0.7491  -(
##
## sigma: 0.198583
## lambda (gene 1): 1.08699
## epsilon (gene 1): -0.252533
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 8440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.825
## delta (gene 1): 14.0884
## s (cell 1): 0.897466
## nu (cell 1): 1.05085
## theta (batch 1): 0.0077697
## betas:    1.3234  -0.2052  -0.8959  -0.0718   1.0416   0.6346   0.8424   1.3160   0.9628   1.1967  -(
##
## sigma: 0.186329
## lambda (gene 1): 1.37962
## epsilon (gene 1): -0.115167
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 8480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 230.723
## delta (gene 1): 14.9017
## s (cell 1): 1.12025
## nu (cell 1): 1.13685
## theta (batch 1): 0.00179581
## betas:    0.9149  -0.2205  -0.6225  -0.2960   0.6435   1.2099   0.7128   1.3935   1.4636   1.0578   -(
##
## sigma: 0.177317
## lambda (gene 1): 1.35729
## epsilon (gene 1): 0.0501349
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 8520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 221.175
## delta (gene 1): 19.4967
## s (cell 1): 1.26876
## nu (cell 1): 1.04329
## theta (batch 1): 0.00953012
## betas:    1.4305  -0.1544  -0.3731  -0.2418   0.5565   1.2343   0.6735   1.0127   1.1772   0.6565   -(
##
## sigma: 0.182938
## lambda (gene 1): 0.473253
## epsilon (gene 1): 0.0990594
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 8560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.947
## delta (gene 1): 20.3338
## s (cell 1): 1.16348
## nu (cell 1): 1.08469
```

```
## theta (batch 1): 0.00745907
## betas:    1.1974  -0.2047  -0.3903  -0.2993   1.0187   0.8703   1.0458   1.1544   1.1498   1.0983  -(
##
## sigma: 0.1884
## lambda (gene 1): 2.35652
## epsilon (gene 1): 0.0377247
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 8600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.916
## delta (gene 1): 17.4364
## s (cell 1): 1.17701
## nu (cell 1): 1.14261
## theta (batch 1): 0.0131787
## betas:    1.6795  -0.1658   0.0734  -0.7827   0.6810   0.7877   0.6615   1.0600   0.8563   1.0508  -(
##
## sigma: 0.201124
## lambda (gene 1): 0.406549
## epsilon (gene 1): -0.0580966
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 8640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 436.64
## delta (gene 1): 15.3852
## s (cell 1): 0.770895
## nu (cell 1): 1.05278
## theta (batch 1): 0.0158796
## betas:    0.7731  -0.1425   0.1158   0.1670   1.0277   0.4043   1.5769   1.0553   1.2159   1.3663  -(
##
## sigma: 0.174794
## lambda (gene 1): 0.964272
## epsilon (gene 1): -0.192244
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 8680 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 335.661
## delta (gene 1): 15.3102
## s (cell 1): 1.13743
## nu (cell 1): 1.05816
## theta (batch 1): 0.0156875
## betas:    0.8954  -0.2095  -0.2120  -0.1290   0.8279   1.2779   0.8765   1.1589   1.6375   0.8659  -(
##
## sigma: 0.185964
## lambda (gene 1): 1.86907
## epsilon (gene 1): 0.0734361
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 8720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.401
## delta (gene 1): 15.5277
## s (cell 1): 1.07327
## nu (cell 1): 1.01588
## theta (batch 1): 0.00848403
## betas:    1.6146  -0.2134   0.2443   0.1292   0.0196   1.1642   0.6872   0.9230   1.4027   0.5179  -(
##
## sigma: 0.179475
## lambda (gene 1): 1.75547
## epsilon (gene 1): -0.0651989
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 8760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 134.903
## delta (gene 1): 16.9543
## s (cell 1): 1.31443
## nu (cell 1): 1.16445
## theta (batch 1): 0.00807619
## betas:    1.3730  -0.1725  -0.1988   0.2216   0.3780   1.0369   0.8449   1.0914   1.1287   0.8611  -(
##
## sigma: 0.194191
## lambda (gene 1): 1.05233
## epsilon (gene 1): -0.506401
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 8800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 133.327
## delta (gene 1): 15.3635
## s (cell 1): 1.09328
## nu (cell 1): 0.999457
## theta (batch 1): 0.00635421
## betas:    1.1198  -0.1645  -0.0679   0.6323   0.8269   1.0339   0.9964   1.0019   1.2975   0.9295  -
##
## sigma: 0.20554
## lambda (gene 1): 1.19887
## epsilon (gene 1): -0.363542
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 8840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 365.582
## delta (gene 1): 15.5403
## s (cell 1): 1.06067
## nu (cell 1): 1.04095
## theta (batch 1): 0.00976495
## betas:    1.3992  -0.1047   0.1464  -0.1173   0.8943   0.8322   1.0231   0.7100   1.3207   0.4325  -
##
## sigma: 0.178417
## lambda (gene 1): 0.930256
## epsilon (gene 1): -0.328258
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 8880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.841
## delta (gene 1): 18.2948
## s (cell 1): 0.94865
## nu (cell 1): 1.08709
## theta (batch 1): 0.0134105
## betas:    1.5172  -0.2220  -0.1782  -0.1937   0.3026   0.9233   0.8552   1.0085   1.2746   0.8261  -
```

```
## 
## sigma: 0.183388
## lambda (gene 1): 0.836287
## epsilon (gene 1): 0.401343
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 8920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.948
## delta (gene 1): 15.7019
## s (cell 1): 0.984855
## nu (cell 1): 1.06874
## theta (batch 1): 0.061787
## betas:    1.6964  -0.1943  -0.5479   0.1216   0.2456   0.6920   1.1665   0.3695   1.5824   0.6741  -(
## 
## sigma: 0.195164
## lambda (gene 1): 0.798684
## epsilon (gene 1): -0.267597
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 8960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.167
## delta (gene 1): 14.9224
## s (cell 1): 1.17128
## nu (cell 1): 1.12999
## theta (batch 1): 0.022918
## betas:    1.8681  -0.2301  -0.5637  -0.8234   0.3771   1.2735  -0.0831   1.4802   0.8355   1.0396  -(
## 
## sigma: 0.182946
## lambda (gene 1): 1.5871
## epsilon (gene 1): 0.100361
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 9000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 269.551
## delta (gene 1): 17.4154
## s (cell 1): 0.916206
## nu (cell 1): 1.06838
## theta (batch 1): 0.0178399
## betas:    1.1959  -0.2487  -0.2408  -0.1389   0.1758   1.0705   0.9576   0.9414   1.6199   1.0135  -(
##
## sigma: 0.205772
## lambda (gene 1): 0.527662
## epsilon (gene 1): -0.279529
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## ------------------------------------------------------------
## Iteration 9040 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.003
## delta (gene 1): 20.0619
## s (cell 1): 0.888892
## nu (cell 1): 1.04842
## theta (batch 1): 0.00692001
## betas:    1.6234  -0.1373  -0.5308   0.2920   0.8127   0.5184   0.8629   0.7718   1.3065   0.4801  -(
##
## sigma: 0.194946
## lambda (gene 1): 0.858175
## epsilon (gene 1): -0.124454
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## ------------------------------------------------------------
## Iteration 9080 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.1
## delta (gene 1): 13.0241
## s (cell 1): 1.08023
## nu (cell 1): 1.13897
## theta (batch 1): 0.00245776
## betas:    1.6100  -0.1120   0.2707   0.2035   0.6969   0.7743   0.6250   1.0079   0.9681   0.6888  -(
##
## sigma: 0.185688
## lambda (gene 1): 1.62378
## epsilon (gene 1): -0.229729
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.7
```

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## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 9120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.578
## delta (gene 1): 14.027
## s (cell 1): 1.07601
## nu (cell 1): 1.03061
## theta (batch 1): 0.000444315
## betas:    1.0779  -0.1172  -0.2240   0.3175   1.0430   1.0247   0.8163   1.2884   0.9743   1.0434  -(
##
## sigma: 0.185836
## lambda (gene 1): 1.24375
## epsilon (gene 1): -0.10262
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 9160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.136
## delta (gene 1): 13.7776
## s (cell 1): 1.1316
## nu (cell 1): 1.14017
## theta (batch 1): 0.00107895
## betas:    1.2660  -0.2808  -0.2974  -0.0137   0.4558   1.1519   0.7079   1.2739   1.4120   1.1531  -(
##
## sigma: 0.187302
## lambda (gene 1): 2.01868
## epsilon (gene 1): -0.170417
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 9200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 276.347
## delta (gene 1): 12.3456
## s (cell 1): 1.09198
## nu (cell 1): 1.05355
## theta (batch 1): 0.000731469
## betas:    1.9868  -0.2448  -0.3851  -0.3300   0.0483   0.4935   1.2550   0.1538   1.7083   0.5779  -(
##
## sigma: 0.191143
```

```
## lambda (gene 1): 1.39051
## epsilon (gene 1): -0.457159
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 9240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.967
## delta (gene 1): 16.1433
## s (cell 1): 1.04259
## nu (cell 1): 1.06427
## theta (batch 1): 0.00196927
## betas:    1.3353  -0.2382  -0.2791  -0.5620   0.6330   0.8119   0.7483   1.3197   1.1503   1.1649  -(
##
## sigma: 0.177655
## lambda (gene 1): 0.755604
## epsilon (gene 1): -0.181185
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 9280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.348
## delta (gene 1): 12.9064
## s (cell 1): 1.09378
## nu (cell 1): 1.11694
## theta (batch 1): 0.00203049
## betas:    1.8556  -0.1592   0.4941  -0.6122   0.3065   0.7120   0.9940   0.5813   1.0765   0.8906  -
##
## sigma: 0.189861
## lambda (gene 1): 0.711213
## epsilon (gene 1): 0.122896
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 9320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 509.807
## delta (gene 1): 14.8394
```

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## s (cell 1): 1.04176
## nu (cell 1): 1.03071
## theta (batch 1): 0.00113867
## betas:     0.9245  -0.1290  -0.0251   0.5569   0.6822   0.7549   1.1965   0.7441   1.8186   0.5049  -(
##
## sigma: 0.188668
## lambda (gene 1): 1.32931
## epsilon (gene 1): 0.110488
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 9360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 198.296
## delta (gene 1): 14.253
## s (cell 1): 1.07435
## nu (cell 1): 1.11639
## theta (batch 1): 0.00378352
## betas:     1.3432  -0.1292  -0.2676  -0.1093   0.7426   0.5754   1.2745   0.6449   1.1997   1.1260  -(
##
## sigma: 0.17263
## lambda (gene 1): 0.657103
## epsilon (gene 1): -0.116589
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 9400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.534
## delta (gene 1): 16.2494
## s (cell 1): 1.22422
## nu (cell 1): 1.13684
## theta (batch 1): 0.00517638
## betas:     0.7779  -0.1663  -0.0916   0.3198   0.7613   0.9435   1.3648   0.9122   1.4743   1.2137  -(
##
## sigma: 0.202511
## lambda (gene 1): 1.33661
## epsilon (gene 1): -0.385884
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
```

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## ----------------------------------------------------------
## Iteration 9440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.042
## delta (gene 1): 17.2535
## s (cell 1): 1.01613
## nu (cell 1): 1.09523
## theta (batch 1): 0.0113457
## betas:    1.0876  -0.1939   0.0085  -0.5048   0.3296   1.5901   0.6742   1.3052   1.1068   1.3424  -(
##
## sigma: 0.190789
## lambda (gene 1): 0.123257
## epsilon (gene 1): -0.319782
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 9480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 130.94
## delta (gene 1): 15.8476
## s (cell 1): 1.24506
## nu (cell 1): 1.13308
## theta (batch 1): 0.0175697
## betas:    1.1809  -0.1829  -0.7245   0.5194   0.6765   0.7931   1.4361   0.5507   1.7414   0.6822  -(
##
## sigma: 0.185782
## lambda (gene 1): 0.880729
## epsilon (gene 1): 0.122628
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 9520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 334.089
## delta (gene 1): 17.275
## s (cell 1): 1.47975
## nu (cell 1): 1.01091
## theta (batch 1): 0.0367389
## betas:    1.5232  -0.1005  -0.0216  -0.2118   0.6007   1.3135   0.2441   1.1848   0.9806   0.7040  -(
##
## sigma: 0.179123
## lambda (gene 1): 0.288261
## epsilon (gene 1): 0.283198
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ----------------------------------------------------------
## Iteration 9560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.847
## delta (gene 1): 12.597
## s (cell 1): 1.69427
## nu (cell 1): 1.10127
## theta (batch 1): 0.0296308
## betas:    1.7035  -0.2184  -0.8443  -0.0095   0.5159   0.8030   0.6643   1.1172   1.0914   0.7587  -(
##
## sigma: 0.184567
## lambda (gene 1): 0.780701
## epsilon (gene 1): -0.439449
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 9600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.549
## delta (gene 1): 19.3912
## s (cell 1): 1.08175
## nu (cell 1): 1.07026
## theta (batch 1): 0.0161379
## betas:    1.4757  -0.1433   0.0046   0.2880   0.6018   0.4912   1.3280   0.6381   1.1558   0.9639  -(
##
## sigma: 0.18864
## lambda (gene 1): 2.16707
## epsilon (gene 1): 0.0257341
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 9640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.473
## delta (gene 1): 15.5319
## s (cell 1): 1.23925
## nu (cell 1): 1.00211
```

```
## theta (batch 1): 0.043494
## betas:    1.4390  -0.3052   0.4362  -0.0335   0.0981   0.8508   1.3568   0.5827   1.8689   0.8999  -
##
## sigma: 0.18278
## lambda (gene 1): 1.39512
## epsilon (gene 1): -0.209282
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 9680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 281.756
## delta (gene 1): 12.9012
## s (cell 1): 0.934888
## nu (cell 1): 1.19196
## theta (batch 1): 0.0831193
## betas:    1.7308  -0.1215   0.0713  -0.1376   0.6562   0.6722   0.8517   0.8024   1.0061   0.5587  -
##
## sigma: 0.180554
## lambda (gene 1): 1.79674
## epsilon (gene 1): -0.032017
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 9720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.177
## delta (gene 1): 14.2633
## s (cell 1): 0.927025
## nu (cell 1): 1.02837
## theta (batch 1): 0.0572301
## betas:    1.6018  -0.0854  -0.0902  -0.2640   0.6814   1.0170   0.5287   0.9875   1.0220   0.3379  -
##
## sigma: 0.18636
## lambda (gene 1): 1.20388
## epsilon (gene 1): -0.0876202
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 9760 out of 40000 has been completed.
```

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## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.722
## delta (gene 1): 16.0979
## s (cell 1): 0.924329
## nu (cell 1): 1.02359
## theta (batch 1): 0.0251675
## betas:    0.6492  -0.1127  -0.5152   0.1488   0.8519   0.9891   1.5902   0.6224   1.7676   0.7909  -
##
## sigma: 0.18456
## lambda (gene 1): 0.246476
## epsilon (gene 1): 0.253901
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 9800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.192
## delta (gene 1): 9.40372
## s (cell 1): 1.11193
## nu (cell 1): 0.991417
## theta (batch 1): 0.0580912
## betas:    1.3456  -0.0827  -0.0842   0.1815   0.6453   1.0693   0.8364   0.8583   1.0148   0.9324  -
##
## sigma: 0.194109
## lambda (gene 1): 0.693933
## epsilon (gene 1): -0.7204
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 9840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.235
## delta (gene 1): 19.7186
## s (cell 1): 1.36195
## nu (cell 1): 1.12963
## theta (batch 1): 0.0609775
## betas:    0.9804  -0.2697   0.2745   0.0119   0.2013   1.2916   0.9372   1.3080   1.4119   1.3022  -
##
## sigma: 0.186402
## lambda (gene 1): 1.77393
## epsilon (gene 1): 0.0251499
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 9880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 116.996
## delta (gene 1): 15.9596
## s (cell 1): 1.1135
## nu (cell 1): 1.19785
## theta (batch 1): 0.0525053
## betas:    1.4568  -0.2331  -0.3658   0.0615   0.2744   1.1425   0.8713   0.7825   1.6468   0.6988  -(
##
## sigma: 0.186951
## lambda (gene 1): 1.35924
## epsilon (gene 1): 0.753583
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 9920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.263
## delta (gene 1): 13.5818
## s (cell 1): 1.68968
## nu (cell 1): 1.01876
## theta (batch 1): 0.0480804
## betas:    0.9648  -0.1242  -0.0494  -0.0887   1.3082   0.5894   1.1607   0.9623   1.4977   0.6393  -(
##
## sigma: 0.186948
## lambda (gene 1): 0.616841
## epsilon (gene 1): -0.525283
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 9960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 347.833
## delta (gene 1): 19.139
## s (cell 1): 1.42131
## nu (cell 1): 1.14389
## theta (batch 1): 0.0353023
## betas:    1.6149  -0.1265   0.0738  -0.2881   0.7450   0.8500   0.6609   0.8939   1.1210   0.5014  -(
```

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```
## 
## sigma: 0.195324
## lambda (gene 1): 1.80715
## epsilon (gene 1): -0.107098
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 10000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 157.257
## delta (gene 1): 14.392
## s (cell 1): 1.06381
## nu (cell 1): 1.13529
## theta (batch 1): 0.0203267
## betas:    1.6942  -0.2929   0.2726  -0.5440   0.4905   0.7777   0.9295   0.6915   1.6131   0.8679  -(
## 
## sigma: 0.206195
## lambda (gene 1): 0.433117
## epsilon (gene 1): -0.368424
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 10040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 259.308
## delta (gene 1): 15.3357
## s (cell 1): 1.26785
## nu (cell 1): 1.15426
## theta (batch 1): 0.0409171
## betas:    1.1517  -0.2254   0.1259   0.0386   0.6900   0.7283   1.2864   0.8924   1.5623   0.8464  -(
## 
## sigma: 0.182288
## lambda (gene 1): 0.583749
## epsilon (gene 1): -0.289032
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 10080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 226.615
## delta (gene 1): 17.9521
## s (cell 1): 0.92887
## nu (cell 1): 1.04852
## theta (batch 1): 0.031883
## betas:     1.8285   -0.1305   -0.2180   -0.1124    0.6655    0.6124    1.0405    0.3298    1.4923    0.1818   -(
##
## sigma: 0.179084
## lambda (gene 1): 1.28532
## epsilon (gene 1): 0.3712
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 10120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.365
## delta (gene 1): 10.0953
## s (cell 1): 1.19666
## nu (cell 1): 1.05267
## theta (batch 1): 0.0111937
## betas:     1.7538   -0.2923   -0.0659   -0.4353   -0.3792    1.0179    0.5013    1.0762    1.2600    1.1296   -(
##
## sigma: 0.183516
## lambda (gene 1): 0.51856
## epsilon (gene 1): -0.560386
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 10160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.762
## delta (gene 1): 13.9049
## s (cell 1): 1.09446
## nu (cell 1): 1.11777
## theta (batch 1): 0.00703929
## betas:     0.8246   -0.1582   -0.2708    0.1755    0.6929    1.2371    1.1728    0.9204    1.5698    0.9344   -(
##
## sigma: 0.182078
## lambda (gene 1): 1.71828
## epsilon (gene 1): -0.161086
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
```

```
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 10200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 486.93
## delta (gene 1): 14.0512
## s (cell 1): 0.881298
## nu (cell 1): 0.978487
## theta (batch 1): 0.0188208
## betas:    1.2459  -0.1470   0.3195  -0.0005   0.2940   1.2591   0.9484   0.6707   1.6952   0.4677  -(
##
## sigma: 0.19147
## lambda (gene 1): 0.534041
## epsilon (gene 1): 0.477274
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 10240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 328.333
## delta (gene 1): 17.0133
## s (cell 1): 1.0443
## nu (cell 1): 1.03713
## theta (batch 1): 0.0159676
## betas:    1.6489  -0.1543   0.1808   0.0679  -0.0153   0.9745   0.9176   0.6472   1.2232   0.8395  -(
##
## sigma: 0.188931
## lambda (gene 1): 0.628263
## epsilon (gene 1): 0.691959
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 10280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.77
## delta (gene 1): 16.0928
## s (cell 1): 1.6638
## nu (cell 1): 1.14439
## theta (batch 1): 0.0211326
## betas:    1.3670  -0.2122   0.0717   0.0413   0.2285   0.3612   1.4293   0.6609   1.5641   0.7228   (
##
## sigma: 0.175953
```

```
## lambda (gene 1): 0.155008
## epsilon (gene 1): 0.17268
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 10320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 289.446
## delta (gene 1): 17.0816
## s (cell 1): 1.03026
## nu (cell 1): 1.03966
## theta (batch 1): 0.0496378
## betas:    1.8839  -0.1398   0.6847  -0.1982   0.5900   0.4735   0.9245   0.9074   0.5640   1.1269  -
##
## sigma: 0.191899
## lambda (gene 1): 0.535765
## epsilon (gene 1): -0.212978
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 10360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.026
## delta (gene 1): 22.2977
## s (cell 1): 1.12749
## nu (cell 1): 1.05009
## theta (batch 1): 0.0240532
## betas:    1.5429  -0.1765   0.2479   0.1461  -0.2264   1.2754   0.6701   0.9549   1.1857   0.8612  -
##
## sigma: 0.187441
## lambda (gene 1): 0.926355
## epsilon (gene 1): 0.201972
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 10400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.725
## delta (gene 1): 14.5339
```

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## s (cell 1): 0.827128
## nu (cell 1): 1.1266
## theta (batch 1): 0.0186539
## betas:    1.2172  -0.1304  -0.7378   0.5828   0.2018   1.6143   0.4198   1.2589   1.2261   0.4950  -0
##
## sigma: 0.181175
## lambda (gene 1): 0.864746
## epsilon (gene 1): -0.263401
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 10440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.295
## delta (gene 1): 21.0658
## s (cell 1): 1.19377
## nu (cell 1): 1.06964
## theta (batch 1): 0.0060914
## betas:    1.2017   0.0050  -0.6924   1.0507   0.3252   1.5082   0.5986   0.9793   1.0114   0.3249  -
##
## sigma: 0.173923
## lambda (gene 1): 1.29892
## epsilon (gene 1): 0.107265
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 10480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 319.796
## delta (gene 1): 17.6903
## s (cell 1): 0.887821
## nu (cell 1): 1.05047
## theta (batch 1): 0.0531205
## betas:    0.9168  -0.2222  -0.0355  -0.0339   0.4873   1.1636   0.7678   1.4898   1.2048   1.4173  -0
##
## sigma: 0.188924
## lambda (gene 1): 0.301204
## epsilon (gene 1): -0.128151
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
```

```
## ----------------------------------------------------------
## Iteration 10520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.739
## delta (gene 1): 13.4825
## s (cell 1): 1.00365
## nu (cell 1): 1.09312
## theta (batch 1): 0.0328407
## betas:    1.2322  -0.1865   0.5578   0.5303  -0.2901   1.3115   0.8214   1.0901   1.1745   1.1994  -(
##
## sigma: 0.185707
## lambda (gene 1): 1.70444
## epsilon (gene 1): 0.301667
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 10560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.287
## delta (gene 1): 12.7751
## s (cell 1): 0.672895
## nu (cell 1): 0.991341
## theta (batch 1): 0.0367634
## betas:    1.3530  -0.0419   0.2000   0.5199   0.4392   0.9090   0.9681   0.7733   1.0964   0.4260  -(
##
## sigma: 0.188686
## lambda (gene 1): 2.29775
## epsilon (gene 1): 0.108567
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 10600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 273.643
## delta (gene 1): 15.3615
## s (cell 1): 0.765366
## nu (cell 1): 1.07036
## theta (batch 1): 0.0886939
## betas:    1.8456  -0.3079   0.0445  -0.4778   0.5146   0.3048   1.2001   0.7596   1.2921   1.0664  -(
##
## sigma: 0.199264
## lambda (gene 1): 0.948452
## epsilon (gene 1): -0.24704
```

```
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 10640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 319.051
## delta (gene 1): 16.6944
## s (cell 1): 1.12128
## nu (cell 1): 1.06627
## theta (batch 1): 0.0884949
## betas:    1.4737  -0.1965   0.0101  -0.3231   0.5326   0.6795   1.1164   0.7583   1.4534   0.7094  -(
##
## sigma: 0.171442
## lambda (gene 1): 0.620364
## epsilon (gene 1): -0.161616
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 10680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 91.0665
## delta (gene 1): 19.7765
## s (cell 1): 1.1549
## nu (cell 1): 1.1003
## theta (batch 1): 0.0330482
## betas:    1.0987  -0.1444   0.3801   0.8145   0.1521   1.2911   0.9590   0.8169   1.5585   0.8147  -(
##
## sigma: 0.181729
## lambda (gene 1): 2.20234
## epsilon (gene 1): -0.0551664
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 10720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 156.667
## delta (gene 1): 17.9712
## s (cell 1): 0.9804
## nu (cell 1): 1.13082
```

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## theta (batch 1): 0.0469547
## betas:    1.6367  -0.2292   0.1632  -0.4589   0.6216   0.3473   1.4396   0.4810   1.6049   0.5535  -(
##
## sigma: 0.185305
## lambda (gene 1): 1.3945
## epsilon (gene 1): 0.124287
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 10760 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 157.076
## delta (gene 1): 19.3245
## s (cell 1): 1.0877
## nu (cell 1): 1.08572
## theta (batch 1): 0.0275423
## betas:    1.1301  -0.1479  -0.5134   0.6111   0.0853   0.8178   1.4346   0.6182   1.5591   0.7111  -(
##
## sigma: 0.178232
## lambda (gene 1): 1.37477
## epsilon (gene 1): 0.0910745
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## -----------------------------------------------------------
## Iteration 10800 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.697
## delta (gene 1): 13.4477
## s (cell 1): 1.19424
## nu (cell 1): 1.09885
## theta (batch 1): 0.0147777
## betas:    1.1583  -0.1686   0.1235   0.2279   0.4439   1.2141   0.7851   1.0931   1.3216   0.8410  -(
##
## sigma: 0.193323
## lambda (gene 1): 2.00459
## epsilon (gene 1): -0.126366
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.4
## -----------------------------------------------------------
## Iteration 10840 out of 40000 has been completed.
```

```
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 113.386
## delta (gene 1): 12.4716
## s (cell 1): 0.912104
## nu (cell 1): 1.01363
## theta (batch 1): 0.0683236
## betas:    1.2540  -0.2248  -0.2041  -0.3344   0.6371   1.1312   0.8080   1.1068   1.4839   0.5829   (
##
## sigma: 0.181393
## lambda (gene 1): 0.684153
## epsilon (gene 1): -0.168611
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.4
## ------------------------------------------------------
## Iteration 10880 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.301
## delta (gene 1): 19.0407
## s (cell 1): 0.659959
## nu (cell 1): 1.08426
## theta (batch 1): 0.0304026
## betas:    1.2907  -0.2222  -0.2020   0.0241   0.4139   1.1285   0.9076   0.8726   1.7143   0.5318  -(
##
## sigma: 0.179841
## lambda (gene 1): 1.06348
## epsilon (gene 1): -0.10486
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.3
## ------------------------------------------------------
## Iteration 10920 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 138.306
## delta (gene 1): 16.4044
## s (cell 1): 0.807106
## nu (cell 1): 1.03568
## theta (batch 1): 0.0488482
## betas:    1.1414  -0.1407  -0.6472   0.2459   0.6170   1.2586   0.4258   1.5846   0.8697   0.9639  -(
##
## sigma: 0.183193
## lambda (gene 1): 1.00277
## epsilon (gene 1): -0.23682
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 10960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.449
## delta (gene 1): 15.1499
## s (cell 1): 1.05954
## nu (cell 1): 1.08595
## theta (batch 1): 0.0224785
## betas:    0.9257  -0.1718  -0.3095   0.2019   0.9495   0.9400   1.0149   1.1819   1.5225   0.5833  -(
##
## sigma: 0.168201
## lambda (gene 1): 2.37277
## epsilon (gene 1): -0.014865
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.5
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 11000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.403
## delta (gene 1): 15.0024
## s (cell 1): 0.877668
## nu (cell 1): 1.05374
## theta (batch 1): 0.0201799
## betas:    1.0163  -0.0686   0.2417   0.0315   0.5171   1.1081   1.2399   0.6868   1.3368   0.8449  -(
##
## sigma: 0.189647
## lambda (gene 1): 0.854005
## epsilon (gene 1): -0.423282
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 11040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.722
## delta (gene 1): 15.9091
## s (cell 1): 1.08221
## nu (cell 1): 1.11251
## theta (batch 1): 0.0126763
## betas:    0.6739  -0.0957  -0.3279  -0.2328   1.1676   0.9926   1.1844   0.9320   1.6104   0.7185  -(
```

```
##
## sigma: 0.178724
## lambda (gene 1): 1.18788
## epsilon (gene 1): -0.358486
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.6
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 11080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 282.835
## delta (gene 1): 20.2368
## s (cell 1): 1.08993
## nu (cell 1): 1.10618
## theta (batch 1): 0.0201858
## betas:    1.7278  -0.2171   0.2456  -0.2445   0.4164   0.1283   1.4759   0.2958   1.6901   0.5207  -(
##
## sigma: 0.18383
## lambda (gene 1): 2.27679
## epsilon (gene 1): 0.399212
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 11120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.079
## delta (gene 1): 11.0517
## s (cell 1): 1.05522
## nu (cell 1): 0.992977
## theta (batch 1): 0.0342999
## betas:    1.1402  -0.1562  -0.1581   0.2661   0.6442   0.8125   1.2664   0.8118   1.4731   0.6195  -(
##
## sigma: 0.182102
## lambda (gene 1): 0.803045
## epsilon (gene 1): -0.0379043
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 11160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 202.211
## delta (gene 1): 17.0073
## s (cell 1): 0.936537
## nu (cell 1): 1.0342
## theta (batch 1): 0.0148155
## betas:    1.7998  -0.1562   0.2642   0.0458   0.3426   0.4846   1.2582   0.3774   1.3358   0.6363   -
##
## sigma: 0.188017
## lambda (gene 1): 0.947437
## epsilon (gene 1): -0.0693761
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 11200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.175
## delta (gene 1): 11.5727
## s (cell 1): 1.04645
## nu (cell 1): 1.00662
## theta (batch 1): 0.0292904
## betas:    0.9228  -0.1451  -0.2138   0.7956   0.5030   1.2109   0.6846   1.6622   0.7545   1.2978   -
##
## sigma: 0.187183
## lambda (gene 1): 0.969636
## epsilon (gene 1): -0.439087
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 11240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.172
## delta (gene 1): 14.094
## s (cell 1): 1.05206
## nu (cell 1): 1.07073
## theta (batch 1): 0.00678212
## betas:    1.0001  -0.1786   0.0196  -0.2985   0.6610   1.3331   0.8396   1.0748   1.5988   0.7500   -
##
## sigma: 0.182752
## lambda (gene 1): 0.95024
## epsilon (gene 1): -0.256244
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 11280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.338
## delta (gene 1): 15.7852
## s (cell 1): 1.08783
## nu (cell 1): 1.03037
## theta (batch 1): 0.0077636
## betas:    1.3901  -0.1458   0.0635  -0.7173   0.8974   1.1415   0.6762   0.8876   1.5613   0.2566  -(
##
## sigma: 0.176637
## lambda (gene 1): 1.32548
## epsilon (gene 1): 0.0783298
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 11320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 153.418
## delta (gene 1): 13.1439
## s (cell 1): 1.00372
## nu (cell 1): 1.15375
## theta (batch 1): 0.00726875
## betas:    1.1259  -0.1418   0.4034   0.7095   0.3376   0.8595   1.3028   0.6618   1.5429   0.7098  -(
##
## sigma: 0.179533
## lambda (gene 1): 0.283797
## epsilon (gene 1): -0.358914
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 11360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.4
## delta (gene 1): 15.1656
## s (cell 1): 1.21729
## nu (cell 1): 1.09069
## theta (batch 1): 0.016981
## betas:    1.0810  -0.1352   0.2492  -0.4088   0.3410   1.3556   1.0478   0.6897   1.6112   0.6939  -(
##
## sigma: 0.175708
```

```
## lambda (gene 1): 0.944181
## epsilon (gene 1): 0.025897
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## -----------------------------------------------------
## Iteration 11400 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.516
## delta (gene 1): 12.7697
## s (cell 1): 0.974641
## nu (cell 1): 1.06538
## theta (batch 1): 0.0170882
## betas:    1.3348  -0.2397  -0.0221  -0.0151   0.3151   1.2994   0.9045   0.9260   1.3238   1.3934   -
##
## sigma: 0.200351
## lambda (gene 1): 1.30838
## epsilon (gene 1): -0.162691
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -----------------------------------------------------
## Iteration 11440 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.241
## delta (gene 1): 15.2657
## s (cell 1): 0.825595
## nu (cell 1): 0.983053
## theta (batch 1): 0.0161614
## betas:    1.5471  -0.1216   0.3153   0.2695   0.2412   0.7691   0.9949   0.8183   1.1256   0.5927   -
##
## sigma: 0.188926
## lambda (gene 1): 1.23713
## epsilon (gene 1): 0.0519487
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -----------------------------------------------------
## Iteration 11480 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.537
## delta (gene 1): 14.343
```

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## s (cell 1): 1.15377
## nu (cell 1): 1.05674
## theta (batch 1): 0.00592474
## betas:    0.5990  -0.1251   0.1423   0.8397   0.3467   1.4546   1.0491   1.0732   1.5887   1.0856  -(
##
## sigma: 0.182581
## lambda (gene 1): 0.52984
## epsilon (gene 1): -0.0948931
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 11520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.951
## delta (gene 1): 19.5445
## s (cell 1): 1.07984
## nu (cell 1): 1.02367
## theta (batch 1): 0.00314783
## betas:    1.0658  -0.2422  -0.5346   0.1545   0.7577   0.7897   1.1987   1.1427   1.3772   1.1281  -(
##
## sigma: 0.185086
## lambda (gene 1): 1.6191
## epsilon (gene 1): -0.0173861
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 11560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.125
## delta (gene 1): 14.8501
## s (cell 1): 1.12778
## nu (cell 1): 1.06342
## theta (batch 1): 0.00437011
## betas:    1.6270  -0.2203   0.3541  -0.5892   0.3254   1.0735   0.8955   0.7034   1.5589   0.5131  -(
##
## sigma: 0.17473
## lambda (gene 1): 1.26524
## epsilon (gene 1): -0.140692
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
```

```
## ----------------------------------------------------------
## Iteration 11600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.074
## delta (gene 1): 15.3263
## s (cell 1): 0.967568
## nu (cell 1): 1.04404
## theta (batch 1): 0.00364087
## betas:    1.2122  -0.0997  -0.1205   0.1688   0.8803   1.1007   0.6855   1.1136   1.1426   0.5772  -(
##
## sigma: 0.195793
## lambda (gene 1): 0.50081
## epsilon (gene 1): 0.128099
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 11640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.817
## delta (gene 1): 14.4242
## s (cell 1): 1.0428
## nu (cell 1): 1.11239
## theta (batch 1): 0.00716955
## betas:    1.4856  -0.0866  -0.6553   0.2536   0.8809   0.7516   1.1409   0.5675   1.1898   0.6616  -
##
## sigma: 0.187901
## lambda (gene 1): 1.3258
## epsilon (gene 1): 0.069864
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 11680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.898
## delta (gene 1): 20.4527
## s (cell 1): 1.17423
## nu (cell 1): 1.08357
## theta (batch 1): 0.0135815
## betas:    1.2984  -0.2120   0.4090  -0.4473   0.3926   0.9770   1.1175   0.7013   1.6645   0.7514  -(
##
## sigma: 0.176359
## lambda (gene 1): 1.0023
## epsilon (gene 1): 0.183005
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 11720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.007
## delta (gene 1): 13.8491
## s (cell 1): 1.09878
## nu (cell 1): 1.1381
## theta (batch 1): 0.00721465
## betas:    1.0577  -0.1038  -0.2423   0.0960   0.6491   0.8445   1.3347   0.6276   1.5966   0.6358  -(
##
## sigma: 0.185317
## lambda (gene 1): 0.575529
## epsilon (gene 1): -0.363462
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 11760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 139.701
## delta (gene 1): 20.7435
## s (cell 1): 0.997048
## nu (cell 1): 1.02673
## theta (batch 1): 0.00103941
## betas:    1.1767  -0.1190  -0.1836   0.3438   0.4405   0.8930   1.1422   0.6993   1.5765   0.5551  -(
##
## sigma: 0.182967
## lambda (gene 1): 1.30012
## epsilon (gene 1): 0.3067
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 11800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 146.229
## delta (gene 1): 13.6248
## s (cell 1): 1.04247
## nu (cell 1): 1.0355
```

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## theta (batch 1): 0.000566059
## betas:    2.1577  -0.2390  -0.6681  -0.3442  -0.1484   1.1275   0.7134   0.3413   1.6875   0.1455  -
##
## sigma: 0.197412
## lambda (gene 1): 0.768188
## epsilon (gene 1): -0.465449
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 11840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 135.67
## delta (gene 1): 15.7703
## s (cell 1): 1.17375
## nu (cell 1): 1.12959
## theta (batch 1): 0.000467373
## betas:    1.3780  -0.0951   0.1389  -0.1338   0.2928   1.0381   0.8195   1.1081   0.8520   0.7645  -
##
## sigma: 0.174779
## lambda (gene 1): 0.694569
## epsilon (gene 1): -0.285203
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 11880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 355.888
## delta (gene 1): 13.4466
## s (cell 1): 1.17071
## nu (cell 1): 1.16764
## theta (batch 1): 0.000202547
## betas:    1.1916  -0.1244  -0.3888  -0.2119   0.0229   1.0199   1.4807   0.2571   1.7930   0.6502  -
##
## sigma: 0.193339
## lambda (gene 1): 0.87649
## epsilon (gene 1): -0.0395225
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 11920 out of 40000 has been completed.
```

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## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 221.805
## delta (gene 1): 12.668
## s (cell 1): 1.16867
## nu (cell 1): 1.16065
## theta (batch 1): 0.000126145
## betas:    1.1023  -0.0859   0.0542   0.3667   0.5207   1.0036   1.1013   0.6241   1.7388   0.2676  -(
##
## sigma: 0.18128
## lambda (gene 1): 1.2717
## epsilon (gene 1): -0.512046
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 11960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 128.485
## delta (gene 1): 13.1606
## s (cell 1): 1.06117
## nu (cell 1): 1.08044
## theta (batch 1): 0.000280245
## betas:    0.9559  -0.2031  -0.3261   0.0538   0.8249   1.0998   1.0629   1.0707   1.5735   0.8046  -(
##
## sigma: 0.193544
## lambda (gene 1): 0.299588
## epsilon (gene 1): -0.0879906
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 12000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 336.227
## delta (gene 1): 12.2167
## s (cell 1): 1.00198
## nu (cell 1): 1.02871
## theta (batch 1): 0.000636642
## betas:    1.2908  -0.2283  -1.1615  -0.5135   1.0284   1.1966   0.7241   0.9082   1.7206   0.5758  (
##
## sigma: 0.198017
## lambda (gene 1): 1.61298
## epsilon (gene 1): 0.0402593
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 12040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.819
## delta (gene 1): 12.4954
## s (cell 1): 1.11971
## nu (cell 1): 1.11899
## theta (batch 1): 0.00224559
## betas:    0.9570  -0.1346   0.6747   0.3150   0.0857   1.4993   1.1757   0.7255   1.6086   0.8347  -(
##
## sigma: 0.179088
## lambda (gene 1): 1.55835
## epsilon (gene 1): 0.0800135
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 12080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.687
## delta (gene 1): 15.1503
## s (cell 1): 0.995525
## nu (cell 1): 1.12732
## theta (batch 1): 0.00338381
## betas:    1.5498  -0.1647  -0.0499   0.3618   0.2877   0.9512   1.0066   0.5695   1.5046   0.5130  -(
##
## sigma: 0.176868
## lambda (gene 1): 0.388511
## epsilon (gene 1): -0.0390577
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 12120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 109.16
## delta (gene 1): 13.8964
## s (cell 1): 1.07648
## nu (cell 1): 1.04163
## theta (batch 1): 0.00217463
## betas:    1.2809  -0.1875   0.1789   0.0065   0.6122   0.8547   1.0256   0.9566   1.3412   0.7798  -(
```

```
## 
## sigma: 0.185552
## lambda (gene 1): 1.75901
## epsilon (gene 1): -0.151378
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 12160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.603
## delta (gene 1): 13.9822
## s (cell 1): 0.927528
## nu (cell 1): 1.03036
## theta (batch 1): 0.00919223
## betas:    1.0613  -0.1797  -0.5006   0.2557   0.9153   0.7120   1.1021   1.1088   1.2694   1.0593  -(
## 
## sigma: 0.183887
## lambda (gene 1): 0.61708
## epsilon (gene 1): 0.105162
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 12200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.366
## delta (gene 1): 18.0721
## s (cell 1): 1.01705
## nu (cell 1): 1.03821
## theta (batch 1): 0.0167696
## betas:    1.6119  -0.1696   0.0067  -0.1649   0.4289   0.8534   0.7864   0.7986   1.2611   0.7627  -(
## 
## sigma: 0.198509
## lambda (gene 1): 1.10922
## epsilon (gene 1): 0.212216
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 12240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 243.126
## delta (gene 1): 17.004
## s (cell 1): 1.149
## nu (cell 1): 1.1262
## theta (batch 1): 0.00322118
## betas:    1.6305  -0.2837   0.0096  -0.1529   0.0856   1.2691   0.6397   0.8169   1.6157   0.8174  -(
##
## sigma: 0.182165
## lambda (gene 1): 1.35112
## epsilon (gene 1): 0.147528
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -1.8
## --------------------------------------------------------
## Iteration 12280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.158
## delta (gene 1): 13.3705
## s (cell 1): 1.14715
## nu (cell 1): 1.05068
## theta (batch 1): 0.0353204
## betas:    1.3621  -0.3059   0.5919   0.1256  -0.3612   1.0753   1.0518   0.9147   1.6378   1.0751  -(
##
## sigma: 0.178764
## lambda (gene 1): 2.51396
## epsilon (gene 1): -0.0752514
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 12320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 278.382
## delta (gene 1): 12.2526
## s (cell 1): 1.09188
## nu (cell 1): 1.12192
## theta (batch 1): 0.0135973
## betas:    1.0881  -0.1485  -0.3726   0.5252   0.1317   1.0958   1.2578   0.6531   1.6672   0.5895  -(
##
## sigma: 0.172119
## lambda (gene 1): 1.39797
## epsilon (gene 1): -0.133594
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
```

```
## LSnu (cell 1): -5
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 12360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 131.743
## delta (gene 1): 15.538
## s (cell 1): 1.15043
## nu (cell 1): 1.08696
## theta (batch 1): 0.0260771
## betas:    1.3043  -0.0902   0.2236  -0.5930   1.0768   0.8581   0.9071   0.9610   0.9141   1.0816  -
##
## sigma: 0.187977
## lambda (gene 1): 0.483438
## epsilon (gene 1): 0.0540834
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 12400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 294.547
## delta (gene 1): 19.8076
## s (cell 1): 1.31553
## nu (cell 1): 1.05253
## theta (batch 1): 0.0288723
## betas:    1.0344  -0.0979  -0.1069  -0.1883   1.1701   0.6703   1.5188   0.4629   1.6252   0.6173  -
##
## sigma: 0.207877
## lambda (gene 1): 2.45052
## epsilon (gene 1): 0.42741
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 12440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 249.155
## delta (gene 1): 11.5022
## s (cell 1): 0.793758
## nu (cell 1): 1.04588
## theta (batch 1): 0.0384344
## betas:    1.0436  -0.1370  -0.5165   0.3627   0.3524   1.3172   0.8316   1.3036   0.7645   1.6839  -
##
## sigma: 0.183925
```

```
## lambda (gene 1): 1.40978
## epsilon (gene 1): -0.133206
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 12480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.256
## delta (gene 1): 15.6946
## s (cell 1): 1.50074
## nu (cell 1): 1.10952
## theta (batch 1): 0.0467641
## betas:    1.2098  -0.1167  -0.2368  -0.4832   1.0027   1.1065   0.8915   0.8312   1.4081   0.6941  -(
##
## sigma: 0.185155
## lambda (gene 1): 1.64252
## epsilon (gene 1): -0.21798
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 12520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.102
## delta (gene 1): 18.537
## s (cell 1): 0.932262
## nu (cell 1): 1.00226
## theta (batch 1): 0.0129384
## betas:    0.8159  -0.0856   0.2588  -0.1495   0.2641   2.0680   0.2084   1.5661   1.1928   0.6076   (
##
## sigma: 0.183823
## lambda (gene 1): 0.442804
## epsilon (gene 1): 0.138927
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 12560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 330.966
## delta (gene 1): 20.6717
```

```
## s (cell 1): 1.02976
## nu (cell 1): 1.14286
## theta (batch 1): 0.00821651
## betas:    0.5713   0.0413   0.9085  -0.0600   1.0782   1.6737   0.7173   1.1608   1.2099   0.4575  -(
##
## sigma: 0.181003
## lambda (gene 1): 0.213109
## epsilon (gene 1): -0.055856
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 12600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.424
## delta (gene 1): 16.8124
## s (cell 1): 1.0062
## nu (cell 1): 1.05644
## theta (batch 1): 0.00454465
## betas:    1.7575  -0.2502  -0.9888  -0.2675   0.0149   1.2054   0.4715   1.0463   1.1327   1.0922  -(
##
## sigma: 0.197104
## lambda (gene 1): 1.07931
## epsilon (gene 1): 0.141229
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 12640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 285.522
## delta (gene 1): 11.2147
## s (cell 1): 1.03894
## nu (cell 1): 1.11238
## theta (batch 1): 0.00267114
## betas:    0.7024  -0.1086  -0.0881   0.2160   0.8222   1.1292   1.2391   0.9085   1.5382   0.9377  -(
##
## sigma: 0.1722
## lambda (gene 1): 1.06289
## epsilon (gene 1): -0.282267
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
```

```
## ---------------------------------------------------------
## Iteration 12680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.124
## delta (gene 1): 18.3381
## s (cell 1): 1.11081
## nu (cell 1): 1.07863
## theta (batch 1): 0.00952941
## betas:    1.6762  -0.2262  -0.8699  -0.3155   0.2989   0.5374   1.2793   0.4660   1.4550   0.9812  -(
##
## sigma: 0.181468
## lambda (gene 1): 0.441133
## epsilon (gene 1): 0.1796
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 12720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 380.69
## delta (gene 1): 13.4595
## s (cell 1): 1.08556
## nu (cell 1): 0.994538
## theta (batch 1): 0.0179358
## betas:    1.4913  -0.1618  -0.4812  -0.1877   0.8296   0.5960   1.0615   0.8361   1.2100   0.8013  -(
##
## sigma: 0.183433
## lambda (gene 1): 1.22863
## epsilon (gene 1): -0.142368
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 12760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 381.601
## delta (gene 1): 13.8911
## s (cell 1): 1.22443
## nu (cell 1): 1.0864
## theta (batch 1): 0.00696201
## betas:    0.5731  -0.0995  -0.1744   0.8207   0.6500   1.5001   1.3150   0.5333   2.0795   0.6648  -(
##
## sigma: 0.193346
## lambda (gene 1): 4.56189
## epsilon (gene 1): 0.0530067
```

```
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## -------------------------------------------------------
## Iteration 12800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.11
## delta (gene 1): 13.6784
## s (cell 1): 1.03534
## nu (cell 1): 1.0145
## theta (batch 1): 0.0103118
## betas:    1.2327  -0.1892  -0.3391   0.3143  -0.1679   1.5426   0.8395   0.9186   1.3680   1.0377  -(
##
## sigma: 0.202435
## lambda (gene 1): 0.599624
## epsilon (gene 1): -0.263346
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 12840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.931
## delta (gene 1): 12.7594
## s (cell 1): 0.935914
## nu (cell 1): 1.06513
## theta (batch 1): 0.0168103
## betas:    0.7537  -0.1067   0.1315   0.2527   0.2759   1.3780   1.3143   0.6440   1.6724   1.0697  -
##
## sigma: 0.18117
## lambda (gene 1): 1.46224
## epsilon (gene 1): -0.322053
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -1.8
## -------------------------------------------------------
## Iteration 12880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 140
## delta (gene 1): 13.6311
## s (cell 1): 1.13711
## nu (cell 1): 1.12401
```

```
## theta (batch 1): 0.013296
## betas:    1.2962   0.0170   0.3027   0.0462   0.2510   1.5128   0.6897   0.6724   1.3657  -0.0588  -
##
## sigma: 0.186032
## lambda (gene 1): 2.23188
## epsilon (gene 1): -0.317683
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 12920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.891
## delta (gene 1): 13.8405
## s (cell 1): 1.12662
## nu (cell 1): 1.06033
## theta (batch 1): 0.0164792
## betas:    1.9602  -0.2227  -0.1834  -0.5245   1.0494   0.5038   0.6159   0.9552   1.0948   0.7848  -
##
## sigma: 0.180283
## lambda (gene 1): 0.511599
## epsilon (gene 1): 0.0261679
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 12960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.804
## delta (gene 1): 18.1196
## s (cell 1): 1.04677
## nu (cell 1): 1.06921
## theta (batch 1): 0.00818353
## betas:    1.2722  -0.1917  -0.0312   0.6253   0.0263   1.1436   0.8371   0.9824   1.5632   0.5877  -
##
## sigma: 0.19396
## lambda (gene 1): 1.25632
## epsilon (gene 1): -0.290836
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 13000 out of 40000 has been completed.
```

```
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.887
## delta (gene 1): 15.1721
## s (cell 1): 0.808591
## nu (cell 1): 1.1058
## theta (batch 1): 0.0323181
## betas:    1.7525  -0.2138   0.3074   0.1420   0.0678   0.6410   1.0128   0.7080   1.3658   0.5291  -(
##
## sigma: 0.206101
## lambda (gene 1): 1.0326
## epsilon (gene 1): -0.0794008
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 13040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.344
## delta (gene 1): 16.5579
## s (cell 1): 0.76345
## nu (cell 1): 1.02339
## theta (batch 1): 0.0141601
## betas:    1.5788  -0.2575  -0.2752   0.0695   0.1131   0.9332   0.8805   1.0419   1.1509   1.2061  -(
##
## sigma: 0.185111
## lambda (gene 1): 0.654654
## epsilon (gene 1): 0.0241941
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 13080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.055
## delta (gene 1): 11.6337
## s (cell 1): 1.09131
## nu (cell 1): 1.07867
## theta (batch 1): 0.00701148
## betas:    1.1137  -0.1913   0.1696   0.3075   0.1542   1.2734   0.8850   1.0352   1.4375   0.9359  -(
##
## sigma: 0.185408
## lambda (gene 1): 0.99547
## epsilon (gene 1): -0.168121
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -1.9
## ----------------------------------------------------------
## Iteration 13120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.611
## delta (gene 1): 12.5793
## s (cell 1): 0.934677
## nu (cell 1): 1.08322
## theta (batch 1): 0.00756564
## betas:    1.4548  -0.1966   0.4988  -0.1151   0.7769   0.6639   0.9229   1.0184   1.1883   0.9124  -0
##
## sigma: 0.187426
## lambda (gene 1): 0.643531
## epsilon (gene 1): -0.132008
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 13160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.714
## delta (gene 1): 13.4432
## s (cell 1): 1.21323
## nu (cell 1): 1.13993
## theta (batch 1): 0.0105984
## betas:    1.6443  -0.1450  -0.2763  -0.1818   0.9791   0.4067   1.0242   0.7584   1.2922   0.1994
##
## sigma: 0.186123
## lambda (gene 1): 0.222351
## epsilon (gene 1): -0.499887
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 13200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.909
## delta (gene 1): 18.59
## s (cell 1): 1.06172
## nu (cell 1): 1.10124
## theta (batch 1): 0.0129414
## betas:    1.0110  -0.0747   0.7366   0.1365   0.3506   1.4171   1.1963   0.4904   1.6279   0.4930  -0
```

```
## 
## sigma: 0.194153
## lambda (gene 1): 1.28306
## epsilon (gene 1): -0.123386
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 13240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.472
## delta (gene 1): 18.5711
## s (cell 1): 0.9513
## nu (cell 1): 1.08137
## theta (batch 1): 0.00732975
## betas:    1.5008  -0.1704   0.3199  -0.6811   1.1660   0.1155   1.5511   0.4834   1.5255   0.3125  -
## 
## sigma: 0.176699
## lambda (gene 1): 0.384587
## epsilon (gene 1): -0.0790275
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 13280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.01
## delta (gene 1): 15.3594
## s (cell 1): 1.16305
## nu (cell 1): 1.07204
## theta (batch 1): 0.00615544
## betas:    1.7487  -0.3019   0.0492  -0.6614  -0.2152   0.9748   0.8096   0.9579   1.3149   0.9757  -
## 
## sigma: 0.186072
## lambda (gene 1): 0.798345
## epsilon (gene 1): -0.0805141
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 13320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 181.289
## delta (gene 1): 15.2621
## s (cell 1): 1.12796
## nu (cell 1): 1.06308
## theta (batch 1): 0.00295491
## betas:      1.8101  -0.1837  -0.4747   0.1071   0.1750   0.8376   0.7687   0.6508   1.4462   0.4325  -(
##
## sigma: 0.182146
## lambda (gene 1): 0.364365
## epsilon (gene 1): -0.361356
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 13360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 126.959
## delta (gene 1): 17.9794
## s (cell 1): 1.04692
## nu (cell 1): 1.02663
## theta (batch 1): 0.00509421
## betas:      0.5889  -0.1089   0.6653   0.0653   1.0582   1.0804   1.0564   1.0737   1.6466   0.7384   (
##
## sigma: 0.186651
## lambda (gene 1): 1.07623
## epsilon (gene 1): -0.276578
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 13400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.565
## delta (gene 1): 16.3046
## s (cell 1): 1.02841
## nu (cell 1): 1.11609
## theta (batch 1): 0.00543829
## betas:      1.5615  -0.2238   0.0417   0.3474   0.5440   0.7575   0.8640   0.9338   1.2549   0.9110  -(
##
## sigma: 0.193843
## lambda (gene 1): 1.81845
## epsilon (gene 1): -0.214166
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
```

```
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 13440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.573
## delta (gene 1): 14.8067
## s (cell 1): 0.959604
## nu (cell 1): 1.06295
## theta (batch 1): 0.00950118
## betas:     1.4182   -0.1511    0.4202   -0.3246    0.7451    0.7376    0.9054    0.9584    1.3467    0.2676
##
## sigma: 0.179913
## lambda (gene 1): 0.358592
## epsilon (gene 1): -0.267022
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 13480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 286.151
## delta (gene 1): 12.2686
## s (cell 1): 1.14243
## nu (cell 1): 1.05525
## theta (batch 1): 0.00771983
## betas:     1.5099   -0.2436    0.1508    0.0445    0.3323    1.0974    0.5593    1.2247    1.1213    1.1617
##
## sigma: 0.189506
## lambda (gene 1): 1.66607
## epsilon (gene 1): -0.171031
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.5
## ---------------------------------------------------------
## Iteration 13520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 298.877
## delta (gene 1): 13.4819
## s (cell 1): 1.42095
## nu (cell 1): 1.14242
## theta (batch 1): 0.00931059
## betas:     1.1360   -0.1412    0.2322    0.5851    0.5173    0.8420    1.1821    0.9195    1.2600    0.8921
##
## sigma: 0.175776
```

```
## lambda (gene 1): 1.35811
## epsilon (gene 1): -0.107582
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.6
## ---------------------------------------------------------
## Iteration 13560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 219.053
## delta (gene 1): 15.9687
## s (cell 1): 1.07065
## nu (cell 1): 1.07143
## theta (batch 1): 0.0280329
## betas:    1.3957  -0.2501   0.0592   0.3657   0.1941   1.0472   0.8372   1.2267   1.1541   1.0712  -(
##
## sigma: 0.171166
## lambda (gene 1): 0.465051
## epsilon (gene 1): -0.472964
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.5
## ---------------------------------------------------------
## Iteration 13600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 141.095
## delta (gene 1): 18.9927
## s (cell 1): 1.20897
## nu (cell 1): 1.01941
## theta (batch 1): 0.0318403
## betas:    1.4270  -0.3030   0.3724  -0.3354   0.7140   0.6435   1.0731   1.0109   1.5088   0.9798  -(
##
## sigma: 0.204205
## lambda (gene 1): 2.42451
## epsilon (gene 1): -0.15301
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.6
## ---------------------------------------------------------
## Iteration 13640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.232
## delta (gene 1): 20.6822
```

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## s (cell 1): 1.14318
## nu (cell 1): 1.07576
## theta (batch 1): 0.0156174
## betas:     1.8262  -0.1876   0.3620   0.1505   0.2200   1.2202   0.3886   1.0207   1.1393   0.4914  -(
##
## sigma: 0.178277
## lambda (gene 1): 1.60149
## epsilon (gene 1): -0.0595642
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.6
## -------------------------------------------------------
## Iteration 13680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.522
## delta (gene 1): 14.2316
## s (cell 1): 0.981137
## nu (cell 1): 1.15843
## theta (batch 1): 0.0260026
## betas:     1.0208  -0.2786   0.1622  -0.1150   0.9331   0.7921   1.1261   1.1144   1.7186   0.8659   (
##
## sigma: 0.187388
## lambda (gene 1): 0.410489
## epsilon (gene 1): 0.240778
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.5
## -------------------------------------------------------
## Iteration 13720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.31
## delta (gene 1): 15.2868
## s (cell 1): 1.24083
## nu (cell 1): 1.02792
## theta (batch 1): 0.0208603
## betas:     1.8047  -0.1535   0.0696   0.1188   0.3338   0.5853   1.0607   0.4382   1.3915   0.5675  -
##
## sigma: 0.179007
## lambda (gene 1): 1.10914
## epsilon (gene 1): -0.139216
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.6
```

```
## ------------------------------------------------------
## Iteration 13760 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.044
## delta (gene 1): 15.4279
## s (cell 1): 1.21318
## nu (cell 1): 1.05239
## theta (batch 1): 0.0441068
## betas:    1.4685  -0.2321  -0.7270   0.3870   0.8342   0.3342   1.3164   0.6931   1.5170   0.9481  -(
##
## sigma: 0.18135
## lambda (gene 1): 1.88364
## epsilon (gene 1): -0.0195874
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.5
## ------------------------------------------------------
## Iteration 13800 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.01
## delta (gene 1): 14.8179
## s (cell 1): 1.15784
## nu (cell 1): 1.05851
## theta (batch 1): 0.016073
## betas:    1.3853  -0.1329   0.4554  -0.5911   0.7339   1.0725   0.6130   1.0078   1.2004   0.7988  -(
##
## sigma: 0.195009
## lambda (gene 1): 1.01963
## epsilon (gene 1): 0.0962198
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ------------------------------------------------------
## Iteration 13840 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.317
## delta (gene 1): 11.1757
## s (cell 1): 0.914198
## nu (cell 1): 1.08783
## theta (batch 1): 0.0183786
## betas:    1.3064  -0.2825   0.1369   0.2381   0.2524   0.8856   0.7955   1.1585   1.5663   0.9309  -(
##
## sigma: 0.183247
## lambda (gene 1): 1.81433
## epsilon (gene 1): -0.18415
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 13880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 288.629
## delta (gene 1): 13.4077
## s (cell 1): 1.04876
## nu (cell 1): 1.00051
## theta (batch 1): 0.0411615
## betas:    1.5814  -0.2260   0.4086  -0.8660   0.7941   0.8520   0.7483   0.9022   1.3342   0.9035  -(
##
## sigma: 0.19597
## lambda (gene 1): 0.233409
## epsilon (gene 1): -0.025619
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.5
## ----------------------------------------------------------
## Iteration 13920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 199.16
## delta (gene 1): 11.1875
## s (cell 1): 0.922013
## nu (cell 1): 1.10468
## theta (batch 1): 0.0128472
## betas:    1.2104  -0.2368  -0.4336   0.2306   0.7619   0.8760   0.9827   1.1096   1.4576   0.8247  -(
##
## sigma: 0.186259
## lambda (gene 1): 1.17585
## epsilon (gene 1): -0.567048
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 13960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 211.544
## delta (gene 1): 13.025
## s (cell 1): 1.37185
## nu (cell 1): 1.01765
```

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## theta (batch 1): 0.0388423
## betas:     1.7176  -0.1743  -0.1184  -0.5730   0.0293   0.7944   0.8811   0.7852   1.0439   1.1111  -(
##
## sigma: 0.180605
## lambda (gene 1): 0.280138
## epsilon (gene 1): -0.461775
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 14000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 111.396
## delta (gene 1): 17.0539
## s (cell 1): 0.931294
## nu (cell 1): 1.02925
## theta (batch 1): 0.062073
## betas:     1.3369  -0.1241  -0.5600  -0.0663   0.4746   0.9047   1.1214   0.7093   1.2245   0.8311  -(
##
## sigma: 0.194175
## lambda (gene 1): 0.0980616
## epsilon (gene 1): -0.1039
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 14040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.805
## delta (gene 1): 13.0109
## s (cell 1): 1.42761
## nu (cell 1): 1.08885
## theta (batch 1): 0.0202747
## betas:     1.1152  -0.0809   0.0971   0.2687   0.5910   1.1769   1.0154   0.5720   1.7784   0.1445  -(
##
## sigma: 0.180355
## lambda (gene 1): 1.60204
## epsilon (gene 1): -0.347748
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 14080 out of 40000 has been completed.
```

```
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 150.186
## delta (gene 1): 15.2835
## s (cell 1): 1.16699
## nu (cell 1): 1.10432
## theta (batch 1): 0.0321767
## betas:    1.2806  -0.1248  -0.4096  -0.0131   0.3174   1.0502   1.0504   0.6364   1.5166   0.6955  -(
##
## sigma: 0.185933
## lambda (gene 1): 0.7984
## epsilon (gene 1): -0.0357434
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.7
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.3
## ------------------------------------------------------
## Iteration 14120 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.339
## delta (gene 1): 14.4109
## s (cell 1): 1.07796
## nu (cell 1): 1.06862
## theta (batch 1): 0.0192479
## betas:    1.1589  -0.1213   0.5096  -0.3372   0.5437   1.2476   0.8550   0.9238   1.3011   0.8833  -(
##
## sigma: 0.184511
## lambda (gene 1): 0.779196
## epsilon (gene 1): -0.0128936
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 14160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.738
## delta (gene 1): 14.3277
## s (cell 1): 1.0996
## nu (cell 1): 1.06776
## theta (batch 1): 0.00554428
## betas:    1.1976  -0.1658   0.2767  -0.2783   0.4257   0.7838   1.3361   0.7150   1.4687   0.9624  -(
##
## sigma: 0.174711
## lambda (gene 1): 0.98996
## epsilon (gene 1): -0.071606
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 14200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.713
## delta (gene 1): 18.4491
## s (cell 1): 0.88255
## nu (cell 1): 1.10533
## theta (batch 1): 0.0151966
## betas:    1.4893  -0.1370  -0.9337   0.7027   0.3547   0.9794   0.9153   0.7338   1.2991   0.7015  -
##
## sigma: 0.196358
## lambda (gene 1): 0.57871
## epsilon (gene 1): -0.0295261
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 14240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 335.24
## delta (gene 1): 17.0171
## s (cell 1): 1.32313
## nu (cell 1): 1.0916
## theta (batch 1): 0.0141275
## betas:    1.4784  -0.1834   0.1391   0.0408   0.3689   1.2781   0.4674   1.3721   0.7476   1.2591  -
##
## sigma: 0.1857
## lambda (gene 1): 2.22532
## epsilon (gene 1): -0.0927611
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 14280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 150.716
## delta (gene 1): 13.5895
## s (cell 1): 1.13866
## nu (cell 1): 0.999903
## theta (batch 1): 0.0192101
## betas:    1.8050  -0.2351  -0.0398  -0.1709   0.5442   0.6209   0.6372   0.9066   1.3506   0.6747  -
```

```
##
## sigma: 0.186736
## lambda (gene 1): 0.538871
## epsilon (gene 1): -0.25146
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 14320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.608
## delta (gene 1): 15.8177
## s (cell 1): 1.03326
## nu (cell 1): 1.01655
## theta (batch 1): 0.0181494
## betas:    1.2850  -0.1973   0.7352   0.0819   0.5674   0.8040   1.1636   0.7653   1.4367   1.0701  -0
##
## sigma: 0.189414
## lambda (gene 1): 1.12811
## epsilon (gene 1): -0.183841
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 14360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 219.84
## delta (gene 1): 11.1403
## s (cell 1): 0.987656
## nu (cell 1): 1.04066
## theta (batch 1): 0.0252635
## betas:    2.2218  -0.2057  -0.2636  -0.2047   0.2792   0.8618   0.2479   1.0678   0.9050   0.3377  -0
##
## sigma: 0.17085
## lambda (gene 1): 0.75362
## epsilon (gene 1): -0.466896
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 14400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 248.569
## delta (gene 1): 17.8334
## s (cell 1): 0.986439
## nu (cell 1): 1.19766
## theta (batch 1): 0.0153854
## betas:    0.7629  -0.1142  -0.0348   0.1367   1.0002   0.9413   1.3050   0.7937   1.6726   0.8072  -(
##
## sigma: 0.200668
## lambda (gene 1): 0.311066
## epsilon (gene 1): 0.239574
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 14440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 370.92
## delta (gene 1): 13.1807
## s (cell 1): 0.984236
## nu (cell 1): 1.06794
## theta (batch 1): 0.0168626
## betas:    1.0741  -0.1410  -0.5695   0.4966   0.0127   1.2143   1.0272   0.8389   1.5798   0.6061  -(
##
## sigma: 0.192466
## lambda (gene 1): 1.84346
## epsilon (gene 1): -0.0491824
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 14480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.925
## delta (gene 1): 10.9941
## s (cell 1): 1.07676
## nu (cell 1): 1.02416
## theta (batch 1): 0.011448
## betas:    1.0985  -0.0870   0.2115  -0.5520   0.5777   0.9383   1.2166   0.6953   1.4243   0.7285  -(
##
## sigma: 0.179902
## lambda (gene 1): 1.25517
## epsilon (gene 1): -0.182056
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
```

```
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 14520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.749
## delta (gene 1): 13.779
## s (cell 1): 1.13194
## nu (cell 1): 1.16703
## theta (batch 1): 0.00524756
## betas:    1.1018  -0.0898  -0.2223   0.3532   0.6424   1.0962   0.9502   0.8753   1.4254   0.4620  -(
##
## sigma: 0.193896
## lambda (gene 1): 1.42841
## epsilon (gene 1): -0.0178956
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 14560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.417
## delta (gene 1): 17.028
## s (cell 1): 0.963818
## nu (cell 1): 1.06156
## theta (batch 1): 0.00703441
## betas:    1.5020  -0.2322  -0.2362  -0.1215   0.7202   0.8838   0.7916   1.0597   1.1471   1.1258  -(
##
## sigma: 0.188381
## lambda (gene 1): 0.466281
## epsilon (gene 1): -0.0875522
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 14600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.024
## delta (gene 1): 10.9659
## s (cell 1): 1.15327
## nu (cell 1): 1.10848
## theta (batch 1): 0.00229857
## betas:    1.2651   0.0059   0.3567   0.1192   0.9830   1.0863   0.8080   0.7226   1.1351   0.2872  -:
##
## sigma: 0.197317
```

```
## lambda (gene 1): 0.772676
## epsilon (gene 1): -0.492076
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 14640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.723
## delta (gene 1): 13.6555
## s (cell 1): 1.21282
## nu (cell 1): 1.17851
## theta (batch 1): 0.00166803
## betas:    1.0218  -0.1008   0.0420   0.7172   0.3986   1.1975   0.9895   0.9718   1.2994   0.5656  -0
##
## sigma: 0.177707
## lambda (gene 1): 2.45331
## epsilon (gene 1): -0.276593
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 14680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 125.775
## delta (gene 1): 13.8033
## s (cell 1): 0.99127
## nu (cell 1): 1.18952
## theta (batch 1): 0.0125201
## betas:    1.4456  -0.1135   0.3092   0.4184   0.3970   1.1338   0.6292   0.8141   1.5346   0.1327  -0
##
## sigma: 0.185351
## lambda (gene 1): 1.37427
## epsilon (gene 1): -0.11296
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 14720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.44
## delta (gene 1): 11.1901
```

```
## s (cell 1): 0.737587
## nu (cell 1): 1.02967
## theta (batch 1): 0.0329136
## betas:    1.6893  -0.2684   0.2819  -0.4775   0.5706   0.7821   0.4501   1.4378   0.8479   1.3227  -(
##
## sigma: 0.182079
## lambda (gene 1): 1.87804
## epsilon (gene 1): -0.201916
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 14760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.638
## delta (gene 1): 16.8057
## s (cell 1): 1.05862
## nu (cell 1): 1.01132
## theta (batch 1): 0.0129385
## betas:    1.4423  -0.1413  -0.2624   0.1300   0.2965   0.9249   1.1208   0.5775   1.4020   0.7339  -(
##
## sigma: 0.178536
## lambda (gene 1): 1.48267
## epsilon (gene 1): -0.374194
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 14800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 247.746
## delta (gene 1): 16.8429
## s (cell 1): 0.965569
## nu (cell 1): 1.02273
## theta (batch 1): 0.00177073
## betas:    1.9886  -0.1198  -0.2541  -0.0765   0.5227   0.4591   1.0381   0.4309   1.0591   0.4399  -(
##
## sigma: 0.186441
## lambda (gene 1): 0.718986
## epsilon (gene 1): -0.187301
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
```

```
## ---------------------------------------------------------
## Iteration 14840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.59
## delta (gene 1): 17.008
## s (cell 1): 0.987884
## nu (cell 1): 0.955926
## theta (batch 1): 0.00447455
## betas:    1.1689  -0.1585   0.0645  -0.0691   0.1392   1.2878   1.1065   0.8356   1.4522   0.6074  -(
##
## sigma: 0.179523
## lambda (gene 1): 0.612743
## epsilon (gene 1): -0.151724
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 14880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 138.543
## delta (gene 1): 12.556
## s (cell 1): 1.01038
## nu (cell 1): 1.03588
## theta (batch 1): 0.00180801
## betas:    1.8041  -0.1413   0.1993  -0.4100   0.3757   0.5362   1.0946   0.3801   1.3788   0.6839  -1
##
## sigma: 0.177182
## lambda (gene 1): 0.634236
## epsilon (gene 1): -0.314004
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 14920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 232.598
## delta (gene 1): 15.1304
## s (cell 1): 0.974675
## nu (cell 1): 1.04247
## theta (batch 1): 0.00225605
## betas:    2.0011  -0.2388  -0.4039  -0.8572   0.1877   0.9291   0.5426   0.5781   1.5904   0.5106  -(
##
## sigma: 0.183324
## lambda (gene 1): 1.15796
## epsilon (gene 1): -0.244801
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 14960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 254.75
## delta (gene 1): 14.9583
## s (cell 1): 1.07248
## nu (cell 1): 1.03393
## theta (batch 1): 0.00259634
## betas:    1.8500  -0.1818   0.4298  -0.3814   0.1376   1.3077   0.4276   0.9661   1.0224   0.6628  -(
##
## sigma: 0.179707
## lambda (gene 1): 0.744199
## epsilon (gene 1): -0.34457
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 15000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.506
## delta (gene 1): 16.2479
## s (cell 1): 1.04104
## nu (cell 1): 1.04152
## theta (batch 1): 0.00325316
## betas:    1.3628  -0.1707  -0.7959  -0.0126   0.6433   0.6453   1.1958   0.5573   1.5958   0.8537  -(
##
## sigma: 0.195372
## lambda (gene 1): 0.392042
## epsilon (gene 1): -0.319808
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 15040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.432
## delta (gene 1): 15.5589
## s (cell 1): 1.14132
## nu (cell 1): 1.10794
```

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## theta (batch 1): 0.00181658
## betas:    1.3543  -0.1486   0.1212  -0.5221   0.5623   0.7095   1.1767   0.4571   1.7039   0.6485  -
##
## sigma: 0.183203
## lambda (gene 1): 1.60237
## epsilon (gene 1): -0.356761
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 15080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.164
## delta (gene 1): 15.7883
## s (cell 1): 1.08629
## nu (cell 1): 1.12818
## theta (batch 1): 0.00290676
## betas:    1.2418  -0.1851   0.4679   0.2077   0.3804   0.7875   1.1858   0.8829   1.2775   1.1748  -
##
## sigma: 0.188848
## lambda (gene 1): 0.949616
## epsilon (gene 1): 0.153825
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 15120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 362.921
## delta (gene 1): 17.3458
## s (cell 1): 1.01462
## nu (cell 1): 1.05123
## theta (batch 1): 0.00111521
## betas:    1.1303  -0.1272  -0.6348   0.3509   0.9971   0.6834   0.9873   1.3501   0.7629   1.1262  -
##
## sigma: 0.170743
## lambda (gene 1): 1.51886
## epsilon (gene 1): -0.484348
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 15160 out of 40000 has been completed.
```

```
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.87
## delta (gene 1): 12.8467
## s (cell 1): 1.00086
## nu (cell 1): 1.05042
## theta (batch 1): 0.00279252
## betas:    1.1996  -0.0908   0.4748  -0.2784   0.5071   1.4164   0.6050   1.0833   1.1249   0.6839  -(
##
## sigma: 0.176278
## lambda (gene 1): 1.69733
## epsilon (gene 1): -0.21583
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.5
## -------------------------------------------------------
## Iteration 15200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.763
## delta (gene 1): 11.1647
## s (cell 1): 1.02912
## nu (cell 1): 1.03742
## theta (batch 1): 0.00116779
## betas:    0.7885  -0.1268   0.1905  -0.1723   0.7859   1.4146   1.1360   0.7964   1.6787   0.7945  -(
##
## sigma: 0.194217
## lambda (gene 1): 1.32128
## epsilon (gene 1): -0.365019
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 15240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.798
## delta (gene 1): 16.4454
## s (cell 1): 1.05313
## nu (cell 1): 1.01327
## theta (batch 1): 0.00199179
## betas:    0.8078  -0.0115   0.6473  -0.4242   0.6480   1.5717   0.6696   1.1484   1.2527   0.4569  -(
##
## sigma: 0.185125
## lambda (gene 1): 0.713645
## epsilon (gene 1): 0.0558471
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.4
## -------------------------------------------------------
## Iteration 15280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.867
## delta (gene 1): 11.5332
## s (cell 1): 1.02405
## nu (cell 1): 1.07822
## theta (batch 1): 0.00120887
## betas:     1.3864  -0.1453  -0.5294  -0.0801   0.6061   0.7828   1.0194   0.8907   1.1081   1.0655  -(
##
## sigma: 0.175985
## lambda (gene 1): 0.634838
## epsilon (gene 1): -0.0731578
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 15320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.137
## delta (gene 1): 11.5391
## s (cell 1): 1.01501
## nu (cell 1): 1.03284
## theta (batch 1): 0.00100132
## betas:     1.2328  -0.1264  -0.6563  -0.1061   0.5722   0.9369   1.2106   0.5839   1.5119   0.8087  -(
##
## sigma: 0.182636
## lambda (gene 1): 0.205184
## epsilon (gene 1): -0.190701
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 15360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 138.322
## delta (gene 1): 17.1396
## s (cell 1): 1.03536
## nu (cell 1): 1.04001
## theta (batch 1): 0.00157807
## betas:     1.3367  -0.1647  -0.4407  -0.0662   0.5966   1.1048   0.6554   1.2521   0.9169   1.1517  -(
```

```
## 
## sigma: 0.185302
## lambda (gene 1): 0.644285
## epsilon (gene 1): 0.466687
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -5.3
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 15400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.061
## delta (gene 1): 14.2498
## s (cell 1): 1.0573
## nu (cell 1): 1.10158
## theta (batch 1): 0.00184229
## betas:    0.9368  -0.1099  -0.1363   0.2091   0.4068   1.2555   1.2216   0.6198   1.6964   0.5662  -(
## 
## sigma: 0.204969
## lambda (gene 1): 0.448454
## epsilon (gene 1): -0.202987
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 15440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 108.059
## delta (gene 1): 20.5513
## s (cell 1): 1.02211
## nu (cell 1): 1.0961
## theta (batch 1): 0.0019928
## betas:    1.6524  -0.1048  -0.1661  -0.5190   0.6225   0.9216   0.7624   0.5974   1.4384   0.2325  -(
## 
## sigma: 0.192041
## lambda (gene 1): 0.958878
## epsilon (gene 1): 0.159111
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.4
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 15480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 649.974
## delta (gene 1): 11.3051
## s (cell 1): 1.32458
## nu (cell 1): 1.10308
## theta (batch 1): 0.0273256
## betas:     1.0271  -0.2298  -0.0787   0.1814   0.0438   1.3633   1.0254   1.0135   1.5794   0.9431  -(
##
## sigma: 0.189455
## lambda (gene 1): 0.576431
## epsilon (gene 1): -0.462715
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -5.3
## LStheta (batch 1): -1.9
## --------------------------------------------------------
## Iteration 15520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.906
## delta (gene 1): 13.7798
## s (cell 1): 1.37487
## nu (cell 1): 1.02081
## theta (batch 1): 0.065941
## betas:     1.0740  -0.1119  -0.1194  -0.0202   0.7659   0.9815   1.1415   0.7974   1.4250   0.7396  -(
##
## sigma: 0.185968
## lambda (gene 1): 1.64308
## epsilon (gene 1): -0.00986601
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -2
## LSnu (cell 1): -5.2
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 15560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 141.977
## delta (gene 1): 16.732
## s (cell 1): 1.25583
## nu (cell 1): 1.10577
## theta (batch 1): 0.02693
## betas:     1.0244  -0.1150   1.1510  -0.4980   0.8744   0.9459   0.9966   1.0696   1.0915   1.1112  -(
##
## sigma: 0.189125
## lambda (gene 1): 1.93778
## epsilon (gene 1): -0.114428
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
```

```
## LSnu (cell 1): -5.1
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 15600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.267
## delta (gene 1): 17.09
## s (cell 1): 1.05147
## nu (cell 1): 1.17482
## theta (batch 1): 0.0332956
## betas:    1.5609  -0.2493   0.3079  -0.0429   0.1062   0.8912   1.0313   0.9231   1.0402   1.4778  -(
##
## sigma: 0.197857
## lambda (gene 1): 0.826549
## epsilon (gene 1): -0.167647
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 15640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.208
## delta (gene 1): 18.7855
## s (cell 1): 0.966967
## nu (cell 1): 1.02309
## theta (batch 1): 0.0306858
## betas:    1.5623  -0.1843   0.1716   0.2713  -0.0097   1.4935   0.2227   1.3367   0.9122   1.0041  -(
##
## sigma: 0.192697
## lambda (gene 1): 2.01762
## epsilon (gene 1): -0.0783864
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 15680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 315.689
## delta (gene 1): 13.5302
## s (cell 1): 0.935319
## nu (cell 1): 1.03023
## theta (batch 1): 0.0316291
## betas:    2.0121  -0.2369   0.0998   0.4180  -0.1763   0.5803   0.8740   0.6854   1.2919   0.5258  -(
##
## sigma: 0.177065
```

```
## lambda (gene 1): 2.27151
## epsilon (gene 1): -0.307294
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 15720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.127
## delta (gene 1): 12.5924
## s (cell 1): 1.10709
## nu (cell 1): 1.05998
## theta (batch 1): 0.010064
## betas:    1.5369  -0.2456  -0.0946   0.3697   0.5908   0.7334   0.9332   1.0476   1.1301   1.1764  -(
##
## sigma: 0.176146
## lambda (gene 1): 0.928708
## epsilon (gene 1): -0.0823051
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -5
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 15760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.032
## delta (gene 1): 14.3227
## s (cell 1): 1.20425
## nu (cell 1): 1.07382
## theta (batch 1): 0.00625185
## betas:    1.2995  -0.1029   0.4035   0.3520   0.3746   1.0189   1.1873   0.4062   1.7529   0.0514  -(
##
## sigma: 0.182586
## lambda (gene 1): 0.446392
## epsilon (gene 1): 0.292515
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.9
## LStheta (batch 1): -2.5
## --------------------------------------------------------
## Iteration 15800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 323.279
## delta (gene 1): 16.0025
```

```
## s (cell 1): 0.859896
## nu (cell 1): 0.958584
## theta (batch 1): 0.0052848
## betas:    1.6283  -0.1106  -0.0826   0.2305   0.4374   0.5644   0.9999   0.7518   0.9519   0.9975  -
##
## sigma: 0.200942
## lambda (gene 1): 1.68945
## epsilon (gene 1): 0.300706
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 15840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.482
## delta (gene 1): 16.0057
## s (cell 1): 1.1646
## nu (cell 1): 1.06222
## theta (batch 1): 0.0110127
## betas:    1.7040  -0.1654   0.0512   0.0087   0.2124   0.7284   0.9984   0.5419   1.5075   0.3426  -
##
## sigma: 0.181322
## lambda (gene 1): 1.61851
## epsilon (gene 1): 0.276779
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 15880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.875
## delta (gene 1): 17.2387
## s (cell 1): 1.22611
## nu (cell 1): 1.2098
## theta (batch 1): 0.00435808
## betas:    0.9821  -0.1999  -0.0459   0.1683   0.7736   1.1438   0.9589   1.3986   1.0308   1.2417  -
##
## sigma: 0.183726
## lambda (gene 1): 1.59342
## epsilon (gene 1): 0.0971808
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
```

```
## ----------------------------------------------------------
## Iteration 15920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.317
## delta (gene 1): 15.2605
## s (cell 1): 1.06979
## nu (cell 1): 1.01164
## theta (batch 1): 0.00677347
## betas:    1.5628  -0.1960   0.5129  -0.1315  -0.0520   0.9196   1.2751   0.2855   1.7570   0.5567  -(
##
## sigma: 0.19983
## lambda (gene 1): 1.95782
## epsilon (gene 1): 0.0596931
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 15960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.459
## delta (gene 1): 16.4578
## s (cell 1): 1.33347
## nu (cell 1): 1.02343
## theta (batch 1): 0.00655152
## betas:    1.2968  -0.1666   0.0441   0.2405   0.3536   1.0367   0.7716   1.0283   1.2922   0.8965  -(
##
## sigma: 0.17687
## lambda (gene 1): 1.49848
## epsilon (gene 1): -0.550587
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 16000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 147.881
## delta (gene 1): 14.8898
## s (cell 1): 0.83662
## nu (cell 1): 0.978953
## theta (batch 1): 0.0143228
## betas:    1.0639  -0.1537   0.0990   0.0119   0.1162   1.5001   0.7578   0.9954   1.4588   0.7877  -(
##
## sigma: 0.185941
## lambda (gene 1): 1.4292
## epsilon (gene 1): -0.414501
```

```
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 16040 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 147.171
## delta (gene 1): 14.1392
## s (cell 1): 1.18876
## nu (cell 1): 1.20186
## theta (batch 1): 0.00713849
## betas:    1.5683  -0.2065  -0.0443  -0.6389   0.5473   1.1185   0.6118   1.2576   0.7715   1.4039  -
##
## sigma: 0.188238
## lambda (gene 1): 1.42904
## epsilon (gene 1): -0.425161
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 16080 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.588
## delta (gene 1): 15.2308
## s (cell 1): 0.831617
## nu (cell 1): 0.995618
## theta (batch 1): 0.020293
## betas:    0.9435  -0.0246  -0.4443  -0.1062   1.2066   1.3324   0.5872   1.1337   1.2263   0.4333  -
##
## sigma: 0.184132
## lambda (gene 1): 0.882324
## epsilon (gene 1): -0.319548
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## -----------------------------------------------------
## Iteration 16120 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.276
## delta (gene 1): 15.698
## s (cell 1): 1.09286
## nu (cell 1): 1.00392
```

```
## theta (batch 1): 0.00623445
## betas:    1.2141  -0.1346  -0.9970   0.2629   0.6053   1.3237   0.6930   1.2116   0.9065   1.1985  -
##
## sigma: 0.178312
## lambda (gene 1): 0.599746
## epsilon (gene 1): 0.0155684
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 16160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.143
## delta (gene 1): 11.1374
## s (cell 1): 1.11861
## nu (cell 1): 0.994913
## theta (batch 1): 0.014064
## betas:    1.0566  -0.0733   0.4358   0.4615   0.6774   1.1108   0.9227   0.8247   1.5921   0.2700  -
##
## sigma: 0.17759
## lambda (gene 1): 0.699763
## epsilon (gene 1): -0.369701
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 16200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.101
## delta (gene 1): 20.9497
## s (cell 1): 0.874653
## nu (cell 1): 1.07415
## theta (batch 1): 0.0231893
## betas:    1.1176  -0.1809   0.3318   0.5265   0.1278   1.2523   0.7491   1.4393   0.8941   1.2628  -
##
## sigma: 0.192453
## lambda (gene 1): 0.915741
## epsilon (gene 1): 0.210635
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 16240 out of 40000 has been completed.
```

```
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 114.212
## delta (gene 1): 14.563
## s (cell 1): 1.52635
## nu (cell 1): 1.00591
## theta (batch 1): 0.0386398
## betas:   1.2153  -0.1457   0.5719  -0.2296   0.7837   1.0490   0.7518   1.1717   1.1221   0.9127  -0
##
## sigma: 0.184165
## lambda (gene 1): 0.982175
## epsilon (gene 1): -0.130722
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 16280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 116.197
## delta (gene 1): 11.6001
## s (cell 1): 0.85508
## nu (cell 1): 1.09599
## theta (batch 1): 0.045759
## betas:   1.1654  -0.2959   0.3255  -0.1871   0.4683   0.6783   1.3040   0.8437   1.7538   1.0808   (
##
## sigma: 0.189862
## lambda (gene 1): 0.530587
## epsilon (gene 1): -0.273769
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 16320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.222
## delta (gene 1): 22.7609
## s (cell 1): 1.46026
## nu (cell 1): 1.03778
## theta (batch 1): 0.0485951
## betas:   1.5366  -0.0713  -0.2758   0.0311   0.4332   0.8641   0.8762   0.8197   1.0103   0.5581  -(
##
## sigma: 0.186845
## lambda (gene 1): 1.01163
## epsilon (gene 1): 0.464842
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 16360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 278.692
## delta (gene 1): 11.6654
## s (cell 1): 1.31361
## nu (cell 1): 1.06162
## theta (batch 1): 0.0613479
## betas:    0.8608  -0.1765  -0.5133   0.2225   0.7001   1.3504   0.7672   1.1957   1.8075   0.1918   (
##
## sigma: 0.18448
## lambda (gene 1): 3.37441
## epsilon (gene 1): -0.383473
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 16400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.41
## delta (gene 1): 14.1947
## s (cell 1): 1.17524
## nu (cell 1): 1.16272
## theta (batch 1): 0.0133676
## betas:    1.4693  -0.1579  -0.4186  -0.1795   0.1719   1.5889   0.5317   0.8423   1.3592   0.7281   -(
##
## sigma: 0.198265
## lambda (gene 1): 0.46021
## epsilon (gene 1): -0.255065
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 16440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.378
## delta (gene 1): 24.1186
## s (cell 1): 1.07067
## nu (cell 1): 1.10076
## theta (batch 1): 0.0316748
## betas:    1.0560  -0.0574   0.1079   0.1078   0.7855   1.3903   0.8082   0.8280   1.4919   0.4358   -(
```

```
## 
## sigma: 0.190029
## lambda (gene 1): 0.703386
## epsilon (gene 1): 0.293612
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 16480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.687
## delta (gene 1): 15.4042
## s (cell 1): 1.59644
## nu (cell 1): 1.09438
## theta (batch 1): 0.0297147
## betas:    0.9620  -0.1607  -0.4443   0.5487   0.9029   0.7153   1.2577   1.1932   0.9657   1.3589  -(
## 
## sigma: 0.183164
## lambda (gene 1): 0.716359
## epsilon (gene 1): 0.188066
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 16520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.857
## delta (gene 1): 14.4446
## s (cell 1): 1.15781
## nu (cell 1): 1.02997
## theta (batch 1): 0.0322664
## betas:    1.1491  -0.2030   0.3163  -0.5399   1.1007   0.7997   1.1416   0.8961   1.5177   0.9521  -(
## 
## sigma: 0.184315
## lambda (gene 1): 0.765259
## epsilon (gene 1): 0.113094
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 16560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 222.426
## delta (gene 1): 12.3919
## s (cell 1): 1.04956
## nu (cell 1): 1.15103
## theta (batch 1): 0.0132021
## betas:     0.9530  -0.2309  -1.0139   0.5257   0.4608   0.9478   1.5530   0.4529   2.1566   0.6086   (
##
## sigma: 0.180237
## lambda (gene 1): 1.75477
## epsilon (gene 1): -0.274055
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## -------------------------------------------------------
## Iteration 16600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 400.696
## delta (gene 1): 12.8881
## s (cell 1): 1.09615
## nu (cell 1): 1.10878
## theta (batch 1): 0.0119781
## betas:     1.5215  -0.1682  -0.5287  -0.3012   0.7995   0.7562   0.9684   0.8456   1.1187   0.8813   -(
##
## sigma: 0.19289
## lambda (gene 1): 0.75265
## epsilon (gene 1): -0.189202
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 16640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 241.597
## delta (gene 1): 13.7062
## s (cell 1): 0.796713
## nu (cell 1): 1.05891
## theta (batch 1): 0.0190027
## betas:     1.5634  -0.1980  -0.7359   0.3785   0.3566   0.8152   0.9095   0.9620   1.1814   0.6662   -(
##
## sigma: 0.186042
## lambda (gene 1): 1.31481
## epsilon (gene 1): -0.096708
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
```

```
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 16680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.982
## delta (gene 1): 16.8551
## s (cell 1): 0.938292
## nu (cell 1): 1.04763
## theta (batch 1): 0.0493265
## betas:    1.3409  -0.2272   0.2597  -0.5258   0.5130   1.1234   1.1741   0.5408   1.9003   0.4642  -0
##
## sigma: 0.183505
## lambda (gene 1): 2.30162
## epsilon (gene 1): 0.0206464
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 16720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.712
## delta (gene 1): 12.7558
## s (cell 1): 0.986437
## nu (cell 1): 1.04459
## theta (batch 1): 0.0479847
## betas:    0.9229  -0.2366   0.4640  -0.6471   0.5951   1.2609   1.1452   0.7608   2.1104   0.5288   (
##
## sigma: 0.182244
## lambda (gene 1): 1.30127
## epsilon (gene 1): -0.0484632
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 16760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 301.093
## delta (gene 1): 11.3438
## s (cell 1): 0.963288
## nu (cell 1): 1.12161
## theta (batch 1): 0.0325691
## betas:    1.4923  -0.2414   0.0812  -0.5029   0.5389   0.9931   0.8738   0.9631   1.4544   0.6027   (
##
## sigma: 0.175697
```

```
## lambda (gene 1): 0.877598
## epsilon (gene 1): -0.315378
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 16800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.777
## delta (gene 1): 14.9832
## s (cell 1): 1.0744
## nu (cell 1): 1.11529
## theta (batch 1): 0.00711336
## betas:    1.0480  -0.0929   0.2200   0.8393   0.2955   1.3260   0.8655   1.0241   1.1526   0.8329  -(
##
## sigma: 0.199457
## lambda (gene 1): 0.3157
## epsilon (gene 1): -0.112471
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 16840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.861
## delta (gene 1): 14.6046
## s (cell 1): 1.28457
## nu (cell 1): 0.96401
## theta (batch 1): 0.0147025
## betas:    1.9132  -0.2852  -0.3494  -0.4616   0.1487   0.7788   0.9290   0.6424   1.5300   0.6424  -(
##
## sigma: 0.183253
## lambda (gene 1): 1.59028
## epsilon (gene 1): -0.138265
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.8
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 16880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 361.258
## delta (gene 1): 12.11
```

```
## s (cell 1): 1.06418
## nu (cell 1): 1.12764
## theta (batch 1): 0.0168801
## betas:    0.9695  -0.1217   0.5468  -0.1449   0.5926   1.0760   1.0426   0.9836   1.3736   0.8705  -(
##
## sigma: 0.169463
## lambda (gene 1): 0.0675641
## epsilon (gene 1): -0.0235137
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -0.9
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 16920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.691
## delta (gene 1): 12.8639
## s (cell 1): 1.28183
## nu (cell 1): 1.15042
## theta (batch 1): 0.0195466
## betas:    1.2931  -0.1134  -0.2910   0.3283   1.0916   0.6880   1.1693   0.6996   1.3233   0.5898  -(
##
## sigma: 0.181422
## lambda (gene 1): 0.659226
## epsilon (gene 1): -0.451726
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 16960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.711
## delta (gene 1): 12.6797
## s (cell 1): 0.834297
## nu (cell 1): 1.04532
## theta (batch 1): 0.0146755
## betas:    1.6778  -0.1024   0.3219  -0.2425   0.4788   1.1142   0.4990   0.7065   1.3819   0.3747  -(
##
## sigma: 0.181497
## lambda (gene 1): 1.01601
## epsilon (gene 1): -0.357268
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.5
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
```

```
## -------------------------------------------------------
## Iteration 17000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.67
## delta (gene 1): 15.8592
## s (cell 1): 1.08755
## nu (cell 1): 1.06925
## theta (batch 1): 0.0165728
## betas:    1.3866  -0.0428  -0.0402   0.1779  -0.1953   1.3797   0.7478   0.8131   0.9993   0.6949  -(
##
## sigma: 0.20258
## lambda (gene 1): 1.31569
## epsilon (gene 1): 0.120456
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 17040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.856
## delta (gene 1): 13.667
## s (cell 1): 1.3789
## nu (cell 1): 1.03874
## theta (batch 1): 0.0346901
## betas:    1.0540  -0.1543   0.2291   0.4072   0.1011   1.3421   1.0556   0.8707   1.3630   1.2185  -(
##
## sigma: 0.17512
## lambda (gene 1): 0.358423
## epsilon (gene 1): 0.000244845
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.6
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 17080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.978
## delta (gene 1): 16.1182
## s (cell 1): 1.14238
## nu (cell 1): 1.17356
## theta (batch 1): 0.0157663
## betas:    1.7796  -0.1478  -0.1285  -0.2632   0.5871   0.7365   0.6273   0.9045   1.0547   0.6687  -(
##
## sigma: 0.177973
## lambda (gene 1): 2.19127
## epsilon (gene 1): -0.309666
```

```
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 17120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.16
## delta (gene 1): 13.5525
## s (cell 1): 0.963042
## nu (cell 1): 1.0267
## theta (batch 1): 0.0209011
## betas:    1.1493  -0.1463   0.2934  -0.1314   0.6248   0.8902   1.3529   0.6624   1.3129   1.2909  -
##
## sigma: 0.182797
## lambda (gene 1): 1.74912
## epsilon (gene 1): 0.182734
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 17160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 165.063
## delta (gene 1): 17.4462
## s (cell 1): 1.36734
## nu (cell 1): 1.0671
## theta (batch 1): 0.0219035
## betas:    1.2121  -0.1412  -0.5964  -0.0545   1.3229   0.2832   1.1071   1.2075   0.9218   1.0903  -
##
## sigma: 0.194207
## lambda (gene 1): 1.95361
## epsilon (gene 1): -0.0304535
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 17200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.653
## delta (gene 1): 16.1054
## s (cell 1): 1.24118
## nu (cell 1): 1.1081
```

```
## theta (batch 1): 0.0103781
## betas:    1.5128  -0.2293  -0.3847  -0.2075   0.5363   1.0844   0.6539   1.0702   1.3057   0.8579  -(
##
## sigma: 0.197462
## lambda (gene 1): 0.716398
## epsilon (gene 1): 0.328661
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 17240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.37
## delta (gene 1): 15.0395
## s (cell 1): 0.953716
## nu (cell 1): 1.02175
## theta (batch 1): 0.0122169
## betas:    1.0612  -0.1534  -0.1303  -0.4191   0.4671   1.2178   0.9165   1.0004   1.5082   0.5795  -(
##
## sigma: 0.183833
## lambda (gene 1): 0.650659
## epsilon (gene 1): 0.278262
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 17280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.99
## delta (gene 1): 19.3248
## s (cell 1): 1.17016
## nu (cell 1): 1.0331
## theta (batch 1): 0.0108878
## betas:    1.3866  -0.0394  -1.2191   0.1657   1.0105   0.5911   1.1850   0.7178   0.9099   0.6176  -(
##
## sigma: 0.176376
## lambda (gene 1): 0.484674
## epsilon (gene 1): -0.175326
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.7
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 17320 out of 40000 has been completed.
```

```
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.995
## delta (gene 1): 14.5949
## s (cell 1): 0.940281
## nu (cell 1): 1.00914
## theta (batch 1): 0.0181981
## betas:    1.2779  -0.0538  -0.0460   0.1435   0.8386   0.9635   0.6279   1.1501   1.0019   0.5155  -(
##
## sigma: 0.179714
## lambda (gene 1): 0.563293
## epsilon (gene 1): -0.268169
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 17360 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.755
## delta (gene 1): 17.834
## s (cell 1): 1.34279
## nu (cell 1): 1.14168
## theta (batch 1): 0.0375273
## betas:    0.9963  -0.2275  -0.3659  -0.4443   0.5797   1.1670   0.8969   1.1961   1.5374   0.9822  -(
##
## sigma: 0.191623
## lambda (gene 1): 1.72031
## epsilon (gene 1): -0.201607
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 17400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.545
## delta (gene 1): 16.243
## s (cell 1): 1.25563
## nu (cell 1): 1.05986
## theta (batch 1): 0.0160989
## betas:    1.4732  -0.2127   0.4341  -0.4755   0.2852   1.2621   0.7172   0.8738   1.4334   0.8983  -(
##
## sigma: 0.211877
## lambda (gene 1): 1.76391
## epsilon (gene 1): 0.0902096
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 17440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 145.304
## delta (gene 1): 16.0115
## s (cell 1): 1.19329
## nu (cell 1): 1.08783
## theta (batch 1): 0.0310638
## betas:    0.9460  -0.0496  -0.4506   0.8700   0.8728   0.9474   1.2555   0.6921   1.5065   0.4228  -(
##
## sigma: 0.181361
## lambda (gene 1): 0.981483
## epsilon (gene 1): 0.100303
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -1.8
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 17480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 294.264
## delta (gene 1): 14.5608
## s (cell 1): 0.98859
## nu (cell 1): 1.08147
## theta (batch 1): 0.00908636
## betas:    1.0458  -0.0245  -0.6863   0.0715   1.0967   0.7729   1.1900   0.6437   1.3442   0.4706  -(
##
## sigma: 0.188979
## lambda (gene 1): 1.25256
## epsilon (gene 1): -0.274487
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## -------------------------------------------------------
## Iteration 17520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.916
## delta (gene 1): 12.3012
## s (cell 1): 1.06463
## nu (cell 1): 1.08285
## theta (batch 1): 0.00232121
## betas:    1.2201  -0.1070  -0.6427  -0.2139   0.7992   1.1614   0.6800   1.1399   1.1648   0.5374  -(
```

```
##
## sigma: 0.197964
## lambda (gene 1): 1.22953
## epsilon (gene 1): -0.141698
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 17560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.185
## delta (gene 1): 23.52
## s (cell 1): 1.04373
## nu (cell 1): 1.0705
## theta (batch 1): 0.00247521
## betas:    0.3442   0.0369  -0.7739   1.1516   1.1728   1.3469   0.9671   1.2485   1.2601   0.6091  -(
##
## sigma: 0.183611
## lambda (gene 1): 2.33356
## epsilon (gene 1): 0.0074638
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 17600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 322.214
## delta (gene 1): 15.8857
## s (cell 1): 1.20138
## nu (cell 1): 1.02823
## theta (batch 1): 0.00311937
## betas:    0.9172  -0.1689  -0.3644  -0.2739   0.1412   1.7375   0.6573   1.0896   1.6382   0.7337  -(
##
## sigma: 0.198232
## lambda (gene 1): 0.63593
## epsilon (gene 1): 0.270704
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 17640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 254.471
## delta (gene 1): 13.6882
## s (cell 1): 0.810394
## nu (cell 1): 1.06286
## theta (batch 1): 0.0423938
## betas:    0.9228  -0.1308  -0.4497  -0.1665   0.7493   1.0928   0.9304   1.2431   1.0289   1.4516  -
##
## sigma: 0.182026
## lambda (gene 1): 0.394238
## epsilon (gene 1): 0.100176
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 17680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 332.675
## delta (gene 1): 15.4141
## s (cell 1): 1.10861
## nu (cell 1): 1.14443
## theta (batch 1): 0.0917548
## betas:    2.1575  -0.3356  -0.0132  -1.2187  -0.2153   0.9448   0.6214   0.8755   1.2149   0.9179  -
##
## sigma: 0.195276
## lambda (gene 1): 1.1624
## epsilon (gene 1): -0.0571891
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 17720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.499
## delta (gene 1): 14.8296
## s (cell 1): 1.18886
## nu (cell 1): 1.06428
## theta (batch 1): 0.080202
## betas:    1.8101  -0.1580   0.0367  -0.0186   0.5386   0.6058   0.6137   1.2220   0.5205   1.2530  -
##
## sigma: 0.177078
## lambda (gene 1): 1.78302
## epsilon (gene 1): -0.294197
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -1.8
```

```
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ---------------------------------------------------------
## Iteration 17760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 193.503
## delta (gene 1): 14.9486
## s (cell 1): 1.32321
## nu (cell 1): 1.12609
## theta (batch 1): 0.0242007
## betas:    1.1731  -0.1184   0.0844   0.1288   0.6605   0.8351   0.8922   1.1331   1.0799   0.9352  -(
##
## sigma: 0.184777
## lambda (gene 1): 0.157443
## epsilon (gene 1): 0.252012
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 17800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.915
## delta (gene 1): 11.6623
## s (cell 1): 1.02163
## nu (cell 1): 0.999269
## theta (batch 1): 0.023508
## betas:    1.7132  -0.3315  -0.1078   0.1170  -0.1212   0.9215   0.8783   0.7733   1.5948   1.0539  -(
##
## sigma: 0.197336
## lambda (gene 1): 1.95684
## epsilon (gene 1): -0.310507
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 17840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.587
## delta (gene 1): 17.7784
## s (cell 1): 0.912622
## nu (cell 1): 1.07256
## theta (batch 1): 0.0178398
## betas:    1.1710  -0.1428   0.2511   0.3038   0.0228   1.1373   1.1434   0.8164   1.2016   1.3439  -:
##
## sigma: 0.176207
```

```
## lambda (gene 1): 1.50022
## epsilon (gene 1): 0.0932063
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 17880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 248.604
## delta (gene 1): 14.3014
## s (cell 1): 0.982896
## nu (cell 1): 1.02279
## theta (batch 1): 0.0236263
## betas:    1.2403  -0.1725   0.7406   0.3131   0.3483   0.9058   1.1618   0.8149   1.4126   0.8484  -(
##
## sigma: 0.188917
## lambda (gene 1): 3.40075
## epsilon (gene 1): 0.0410059
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 17920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.722
## delta (gene 1): 12.6001
## s (cell 1): 1.23494
## nu (cell 1): 1.24633
## theta (batch 1): 0.00300615
## betas:    1.8778  -0.2378   0.3463  -0.8992   1.1346   0.1189   1.3909   0.3698   1.4703   0.6754  -(
##
## sigma: 0.182793
## lambda (gene 1): 1.02833
## epsilon (gene 1): 0.01392
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## --------------------------------------------------------
## Iteration 17960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.365
## delta (gene 1): 14.9811
```

```
## s (cell 1): 1.10831
## nu (cell 1): 1.11745
## theta (batch 1): 0.00165653
## betas:    1.2789  -0.1494   0.2154   0.1831   0.4916   1.0777   0.9373   0.7833   1.3954   0.9538  -(
##
## sigma: 0.191467
## lambda (gene 1): 0.575685
## epsilon (gene 1): -0.0387771
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ----------------------------------------------------------
## Iteration 18000 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 306.474
## delta (gene 1): 11.5398
## s (cell 1): 1.01708
## nu (cell 1): 0.993841
## theta (batch 1): 0.00616475
## betas:    1.2687  -0.2279   0.7685  -0.3255   0.2468   1.1796   1.0693   0.5340   1.9087   0.7253  -(
##
## sigma: 0.19607
## lambda (gene 1): 1.48549
## epsilon (gene 1): -0.13962
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
## ----------------------------------------------------------
## Iteration 18040 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.634
## delta (gene 1): 15.1407
## s (cell 1): 1.01849
## nu (cell 1): 1.04903
## theta (batch 1): 0.00617071
## betas:    1.4194  -0.2204  -0.5589   0.0007   0.2223   0.8730   0.9130   0.9088   1.3928   0.9918  -(
##
## sigma: 0.176264
## lambda (gene 1): 1.49333
## epsilon (gene 1): 0.164902
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2.4
```

```
## ---------------------------------------------------------
## Iteration 18080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.371
## delta (gene 1): 12.9467
## s (cell 1): 0.923491
## nu (cell 1): 1.04354
## theta (batch 1): 0.0137472
## betas:    1.4825  -0.2640  -0.2641  -0.3141   0.5985   1.0429   0.6737   1.2359   1.2114   0.9678  -(
##
## sigma: 0.174522
## lambda (gene 1): 1.28276
## epsilon (gene 1): -0.296567
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ---------------------------------------------------------
## Iteration 18120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.275
## delta (gene 1): 14.4421
## s (cell 1): 1.17136
## nu (cell 1): 1.04177
## theta (batch 1): 0.0191351
## betas:    1.6026  -0.3103   0.4187  -0.5555   0.0892   0.9648   1.0755   0.7217   1.7907   0.5386   (
##
## sigma: 0.183902
## lambda (gene 1): 0.609834
## epsilon (gene 1): -0.177933
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 18160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.253
## delta (gene 1): 14.8124
## s (cell 1): 0.937281
## nu (cell 1): 1.02035
## theta (batch 1): 0.0154662
## betas:    1.1960  -0.1905   0.5604  -0.0803   0.6863   0.7354   1.1108   0.9098   1.5273   0.7729  -(
##
## sigma: 0.186897
## lambda (gene 1): 1.69836
## epsilon (gene 1): -0.120133
```

```
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ------------------------------------------------------
## Iteration 18200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.039
## delta (gene 1): 16.6673
## s (cell 1): 1.17297
## nu (cell 1): 1.02814
## theta (batch 1): 0.0575314
## betas:    1.9167  -0.2369  -0.2801   0.2088   0.1893   0.6568   0.8536   0.8186   1.0286   1.0357  -(
##
## sigma: 0.204391
## lambda (gene 1): 0.983287
## epsilon (gene 1): -0.183465
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 18240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.692
## delta (gene 1): 17.1634
## s (cell 1): 1.71775
## nu (cell 1): 1.11471
## theta (batch 1): 0.156523
## betas:    1.6187  -0.2708   0.2770   0.2113   0.3782   0.8148   0.7216   1.1895   1.1047   1.2137  -(
##
## sigma: 0.18341
## lambda (gene 1): 0.364836
## epsilon (gene 1): -0.13381
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ------------------------------------------------------
## Iteration 18280 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.122
## delta (gene 1): 13.127
## s (cell 1): 0.848323
## nu (cell 1): 1.05154
```

```
## theta (batch 1): 0.0370101
## betas:    1.2176  -0.2353   0.0752  -0.0857   0.4914   0.8537   0.8520   1.1515   1.4659   0.9774  -(
##
## sigma: 0.176377
## lambda (gene 1): 1.91795
## epsilon (gene 1): -0.162836
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.5
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 18320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 130.278
## delta (gene 1): 13.6785
## s (cell 1): 1.2255
## nu (cell 1): 1.14933
## theta (batch 1): 0.034731
## betas:    1.0499  -0.2187   0.5154  -0.0116   0.8674   0.9824   0.9572   1.0935   1.5923   0.7361  -(
##
## sigma: 0.184397
## lambda (gene 1): 0.627215
## epsilon (gene 1): 0.128122
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.4
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ----------------------------------------------------------
## Iteration 18360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 127.502
## delta (gene 1): 12.4451
## s (cell 1): 1.26636
## nu (cell 1): 1.18383
## theta (batch 1): 0.0103857
## betas:    1.2517  -0.2169  -0.0273   0.4141   0.0035   1.0961   1.1414   0.6197   1.8076   0.7660  -(
##
## sigma: 0.182231
## lambda (gene 1): 2.95989
## epsilon (gene 1): -0.244925
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 18400 out of 40000 has been completed.
```

```
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 406.526
## delta (gene 1): 15.0255
## s (cell 1): 0.972979
## nu (cell 1): 1.0196
## theta (batch 1): 0.0199188
## betas:   1.6129  -0.1421   0.4358  -0.2004   0.6925   0.9632   0.8315   0.6148   1.3776   0.6197  -
##
## sigma: 0.198088
## lambda (gene 1): 1.32915
## epsilon (gene 1): -0.290896
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 18440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 291.288
## delta (gene 1): 16.4439
## s (cell 1): 1.00708
## nu (cell 1): 1.12216
## theta (batch 1): 0.0235285
## betas:   1.3178  -0.1799   0.2670   0.3041   0.7583   0.6336   1.3026   0.5869   1.6807   0.5801  -0
##
## sigma: 0.179633
## lambda (gene 1): 1.07354
## epsilon (gene 1): -0.188894
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 18480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.516
## delta (gene 1): 16.3967
## s (cell 1): 1.18567
## nu (cell 1): 1.15745
## theta (batch 1): 0.0178417
## betas:   1.0613  -0.1510   0.2156   0.3043   0.5651   1.1794   1.1134   0.8685   1.3819   1.0563  -0
##
## sigma: 0.183376
## lambda (gene 1): 0.287671
## epsilon (gene 1): -0.32314
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.3
## --------------------------------------------------------
## Iteration 18520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 281.655
## delta (gene 1): 17.9571
## s (cell 1): 1.01549
## nu (cell 1): 1.06844
## theta (batch 1): 0.00991989
## betas:    2.0311  -0.2236  -0.7773   0.2613  -0.1702   1.0023   0.3661   0.9869   1.0129   0.9156  -(
##
## sigma: 0.181703
## lambda (gene 1): 1.32389
## epsilon (gene 1): -0.215509
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 18560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.659
## delta (gene 1): 13.5807
## s (cell 1): 0.883163
## nu (cell 1): 1.13682
## theta (batch 1): 0.0286515
## betas:    1.4794  -0.0922  -0.3076   0.2645   0.7127   0.4430   1.1799   0.6474   1.1717   0.7059  -(
##
## sigma: 0.186924
## lambda (gene 1): 0.260129
## epsilon (gene 1): -0.367
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 18600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 115.453
## delta (gene 1): 15.1908
## s (cell 1): 1.14157
## nu (cell 1): 1.09122
## theta (batch 1): 0.0226343
## betas:    0.9962  -0.1026  -0.3616  -0.0645   0.7349   1.1888   0.9325   1.0043   1.2458   0.8990  -(
```

```
## 
## sigma: 0.19973
## lambda (gene 1): 0.352223
## epsilon (gene 1): -0.501576
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.2
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 18640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 147.89
## delta (gene 1): 11.8438
## s (cell 1): 1.38213
## nu (cell 1): 1.09636
## theta (batch 1): 0.0190914
## betas:    1.8597  -0.1513  -0.3398  -0.6980   0.6170   0.6901   0.8002   0.8100   0.8806   0.8954  -(
## 
## sigma: 0.178438
## lambda (gene 1): 1.1281
## epsilon (gene 1): -0.73566
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.2
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 18680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.639
## delta (gene 1): 14.5198
## s (cell 1): 0.79353
## nu (cell 1): 1.03399
## theta (batch 1): 0.0399786
## betas:    0.8370  -0.0230  -0.0973  -0.1232   0.6012   0.9988   1.3990   0.5738   1.6836   0.3780  -(
## 
## sigma: 0.175054
## lambda (gene 1): 1.20248
## epsilon (gene 1): -0.410094
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 18720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 191.735
## delta (gene 1): 14.104
## s (cell 1): 0.991304
## nu (cell 1): 1.11905
## theta (batch 1): 0.0220686
## betas:    1.2622  -0.1259  -0.3972  -0.0447   0.0681   1.2963   1.0727   0.6458   1.4774   0.5048  -(
##
## sigma: 0.195554
## lambda (gene 1): 0.785101
## epsilon (gene 1): 0.300845
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.2
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 18760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.952
## delta (gene 1): 13.2004
## s (cell 1): 1.12206
## nu (cell 1): 1.06776
## theta (batch 1): 0.021499
## betas:    1.5253  -0.1699  -0.4797   0.0241   0.2490   1.2759   0.6574   0.7366   1.5987   0.3674  -(
##
## sigma: 0.18291
## lambda (gene 1): 1.76306
## epsilon (gene 1): -0.0858832
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.3
## LStheta (batch 1): -2.1
## ----------------------------------------------------------
## Iteration 18800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.259
## delta (gene 1): 15.797
## s (cell 1): 1.00578
## nu (cell 1): 1.0461
## theta (batch 1): 0.00953391
## betas:    1.6344  -0.1588   0.2148  -0.3604   0.0245   1.0140   1.0662   0.3209   1.5887   0.6580  -(
##
## sigma: 0.194736
## lambda (gene 1): 0.748796
## epsilon (gene 1): -0.0181735
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
```

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## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 18840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.411
## delta (gene 1): 13.8192
## s (cell 1): 0.86016
## nu (cell 1): 0.98589
## theta (batch 1): 0.0251347
## betas:    1.3803  -0.2893   0.4186  -0.6992   0.3438   1.1771   0.7461   0.8897   1.6414   1.1852  -(
##
## sigma: 0.177107
## lambda (gene 1): 0.387375
## epsilon (gene 1): -0.162761
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 18880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 341.632
## delta (gene 1): 13.8106
## s (cell 1): 1.17618
## nu (cell 1): 1.01312
## theta (batch 1): 0.01979
## betas:    1.1767  -0.3195   0.1793  -0.4609   0.8526   0.8783   0.9140   1.4535   1.2184   1.4848  -(
##
## sigma: 0.183611
## lambda (gene 1): 0.882307
## epsilon (gene 1): -0.0615416
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 18920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.186
## delta (gene 1): 11.7651
## s (cell 1): 0.995563
## nu (cell 1): 1.12311
## theta (batch 1): 0.0189304
## betas:    1.9609  -0.2729   0.1684  -0.0484   0.2711   0.6182   0.8906   0.6399   1.5745   0.3280   (
##
## sigma: 0.173097
```

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## lambda (gene 1): 2.11508
## epsilon (gene 1): -0.268926
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.4
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 18960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.821
## delta (gene 1): 13.4076
## s (cell 1): 0.988268
## nu (cell 1): 1.10337
## theta (batch 1): 0.00807972
## betas:    1.7349  -0.2286   0.3442   0.1741   0.2546   0.5843   1.0080   0.8425   1.1815   0.8967  -(
##
## sigma: 0.17989
## lambda (gene 1): 2.12083
## epsilon (gene 1): -0.122858
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.3
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 19000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.412
## delta (gene 1): 15.8266
## s (cell 1): 0.941669
## nu (cell 1): 1.08813
## theta (batch 1): 0.00991084
## betas:    0.8823  -0.1704   0.4353   0.3008   0.5052   1.3113   0.9133   1.1582   1.5399   0.5927   (
##
## sigma: 0.19454
## lambda (gene 1): 1.56091
## epsilon (gene 1): -0.109946
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 19040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.9
## delta (gene 1): 14.7059
```

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## s (cell 1): 1.48005
## nu (cell 1): 1.11207
## theta (batch 1): 0.0319611
## betas:    1.1902  -0.1430  -0.1782   0.4945   0.7758   0.8657   0.9388   1.0018   1.4805   0.2765  -(
##
## sigma: 0.178504
## lambda (gene 1): 2.22859
## epsilon (gene 1): -0.139854
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## -------------------------------------------------------
## Iteration 19080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.632
## delta (gene 1): 13.6278
## s (cell 1): 0.960945
## nu (cell 1): 1.09616
## theta (batch 1): 0.024056
## betas:    1.7000  -0.2424   0.0003   0.3487   0.0484   0.7798   1.0979   0.4827   1.7255   0.5221  -(
##
## sigma: 0.177323
## lambda (gene 1): 0.807109
## epsilon (gene 1): -0.408206
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## -------------------------------------------------------
## Iteration 19120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 295.251
## delta (gene 1): 16.5962
## s (cell 1): 1.0154
## nu (cell 1): 1.04864
## theta (batch 1): 0.0311968
## betas:    1.4965  -0.1894  -0.3921  -0.2580   0.5358   0.4010   1.2633   0.7365   1.1645   1.2025  -(
##
## sigma: 0.188211
## lambda (gene 1): 1.37458
## epsilon (gene 1): -0.236445
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -1.8
```

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## ---------------------------------------------------------
## Iteration 19160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 254.518
## delta (gene 1): 16.3309
## s (cell 1): 1.28529
## nu (cell 1): 1.07551
## theta (batch 1): 0.0260044
## betas:    1.1876  -0.0954   0.4378  -0.3438   0.5135   1.1302   0.9199   0.7651   1.5096   0.4580  -(
##
## sigma: 0.179181
## lambda (gene 1): 0.8641
## epsilon (gene 1): 0.235402
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.3
## LStheta (batch 1): -1.7
## ---------------------------------------------------------
## Iteration 19200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 311.688
## delta (gene 1): 13.9376
## s (cell 1): 1.10225
## nu (cell 1): 1.04314
## theta (batch 1): 0.0523556
## betas:    1.8728  -0.1699  -0.0788  -0.3144  -0.0984   0.8926   1.0907   0.2653   1.4670   0.5731  -(
##
## sigma: 0.195937
## lambda (gene 1): 1.67696
## epsilon (gene 1): 0.0527438
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 19240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 271.147
## delta (gene 1): 14.1299
## s (cell 1): 1.26541
## nu (cell 1): 1.03517
## theta (batch 1): 0.0297833
## betas:    1.8437  -0.3079   0.0754  -0.5453   0.2150   0.6947   1.0096   0.6771   1.6463   0.6440  -(
##
## sigma: 0.181326
## lambda (gene 1): 2.85401
## epsilon (gene 1): 0.129152
```

```
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -1.8
## ---------------------------------------------------------
## Iteration 19280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 145.836
## delta (gene 1): 15.2526
## s (cell 1): 0.983224
## nu (cell 1): 1.03202
## theta (batch 1): 0.0269299
## betas:    1.7588  -0.1555   0.3115  -0.4140   0.5006   0.9428   0.9769   0.2936   1.7269   0.1304  -(
##
## sigma: 0.197097
## lambda (gene 1): 0.978731
## epsilon (gene 1): -0.240366
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -1.9
## ---------------------------------------------------------
## Iteration 19320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.184
## delta (gene 1): 15.8665
## s (cell 1): 1.33005
## nu (cell 1): 1.00681
## theta (batch 1): 0.0316547
## betas:    1.1588  -0.2455   0.1259  -0.2382   0.4732   0.7497   0.9846   1.2000   1.3122   1.3021  -(
##
## sigma: 0.189093
## lambda (gene 1): 0.903581
## epsilon (gene 1): -0.135582
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2
## ---------------------------------------------------------
## Iteration 19360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.367
## delta (gene 1): 13.1301
## s (cell 1): 1.11481
## nu (cell 1): 1.08158
```

```
## theta (batch 1): 0.0305359
## betas:    1.7403  -0.3297  -0.7940  -0.1197   0.4795   0.5794   0.9960   0.9023   1.5117   0.8719  -(
##
## sigma: 0.189716
## lambda (gene 1): 0.685714
## epsilon (gene 1): -0.309127
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 19400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.344
## delta (gene 1): 12.6555
## s (cell 1): 0.97715
## nu (cell 1): 1.07176
## theta (batch 1): 0.0204004
## betas:    2.0097  -0.2123   0.2817  -0.0628   0.2590   0.3123   1.1362   0.6014   1.0115   0.9883  -(
##
## sigma: 0.199916
## lambda (gene 1): 0.808761
## epsilon (gene 1): -0.202685
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 19440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.519
## delta (gene 1): 15.0871
## s (cell 1): 1.0325
## nu (cell 1): 1.01137
## theta (batch 1): 0.0224959
## betas:    1.6375  -0.3125  -0.1035  -0.5282   0.6704   0.7013   1.1229   0.5039   2.0283   0.5173   (
##
## sigma: 0.189146
## lambda (gene 1): 1.57643
## epsilon (gene 1): -0.0142109
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 19480 out of 40000 has been completed.
```

```
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 193.381
## delta (gene 1): 18.7978
## s (cell 1): 1.07735
## nu (cell 1): 1.12546
## theta (batch 1): 0.00811774
## betas:    1.2765  -0.1947   0.3249   0.3450   0.1812   1.1942   0.9222   0.7443   1.8351   0.3297   (
##
## sigma: 0.184881
## lambda (gene 1): 1.32642
## epsilon (gene 1): -0.0172997
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.3
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 19520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 120.302
## delta (gene 1): 13.2505
## s (cell 1): 1.03709
## nu (cell 1): 1.10548
## theta (batch 1): 0.00998385
## betas:    1.3625  -0.1718  -0.2652   0.3054  -0.0135   1.3133   0.6170   1.1384   1.2458   0.7164  -(
##
## sigma: 0.188074
## lambda (gene 1): 1.06786
## epsilon (gene 1): -0.730744
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 19560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 256.061
## delta (gene 1): 9.58051
## s (cell 1): 1.02812
## nu (cell 1): 1.03219
## theta (batch 1): 0.0365497
## betas:    1.1360  -0.1570   0.1714   0.0755   1.0550   0.5222   1.1252   1.0745   1.2947   0.7686  -(
##
## sigma: 0.17809
## lambda (gene 1): 1.30352
## epsilon (gene 1): -0.558863
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
```

```
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.1
## ---------------------------------------------------------
## Iteration 19600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 188.589
## delta (gene 1): 9.92087
## s (cell 1): 1.16028
## nu (cell 1): 1.05424
## theta (batch 1): 0.0192146
## betas:    1.9210  -0.2359  -0.1117  -0.0229   0.9159   0.1877   0.8539   1.0946   0.8607   0.8227  -(
##
## sigma: 0.202067
## lambda (gene 1): 0.807677
## epsilon (gene 1): -0.618263
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 19640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 232.18
## delta (gene 1): 15.4506
## s (cell 1): 0.860382
## nu (cell 1): 1.04453
## theta (batch 1): 0.0152792
## betas:    1.3904  -0.2284   0.2084  -0.0037   0.7998   0.5358   1.3055   0.8913   1.3293   0.8859  -(
##
## sigma: 0.181862
## lambda (gene 1): 1.24965
## epsilon (gene 1): -0.164128
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 19680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.095
## delta (gene 1): 21.5324
## s (cell 1): 1.07319
## nu (cell 1): 1.04558
## theta (batch 1): 0.026804
## betas:    1.3636  -0.1462   0.4205   0.0064   0.9111   0.6220   1.1151   0.7816   1.3875   0.6045  -(
```

```
## 
## sigma: 0.174995
## lambda (gene 1): 2.18492
## epsilon (gene 1): 0.0317974
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 19720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 162.671
## delta (gene 1): 16.3835
## s (cell 1): 0.87885
## nu (cell 1): 1.06695
## theta (batch 1): 0.0171892
## betas:    1.7580  -0.2075  -0.5875   0.3403   0.6140   0.8192   0.5247   1.3218   0.7920   0.8602  -(
## 
## sigma: 0.184571
## lambda (gene 1): 0.403309
## epsilon (gene 1): 0.0525849
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.8
## LStheta (batch 1): -2
## --------------------------------------------------------
## Iteration 19760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.912
## delta (gene 1): 18.2814
## s (cell 1): 0.998002
## nu (cell 1): 1.09552
## theta (batch 1): 0.0252728
## betas:    1.1788  -0.1626   0.5434   0.0632   0.2981   1.4546   0.8038   1.0836   1.3090   0.6728  -(
## 
## sigma: 0.178347
## lambda (gene 1): 0.961719
## epsilon (gene 1): -0.11081
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.1
## --------------------------------------------------------
## Iteration 19800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
```

```
## mu (gene 1): 277.87
## delta (gene 1): 14.5233
## s (cell 1): 0.832411
## nu (cell 1): 1.09315
## theta (batch 1): 0.0460197
## betas:    1.4479  -0.2263  -0.4379  -0.5858   1.1640   1.0104   0.6746   1.0550   1.4266   0.6790  -(
##
## sigma: 0.196151
## lambda (gene 1): 0.684265
## epsilon (gene 1): 0.0646397
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 19840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 280.392
## delta (gene 1): 12.8942
## s (cell 1): 1.11728
## nu (cell 1): 1.1256
## theta (batch 1): 0.0374664
## betas:    1.4233  -0.1308  -0.1722   0.3192   0.2789   0.9304   1.1739   0.4831   1.5221   0.6099  -(
##
## sigma: 0.183876
## lambda (gene 1): 0.692445
## epsilon (gene 1): -0.0533703
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 19880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.853
## delta (gene 1): 14.375
## s (cell 1): 1.15244
## nu (cell 1): 1.13533
## theta (batch 1): 0.0220227
## betas:    0.7645  -0.1243   0.0879   0.2369   1.2260   0.9434   1.0823   1.0915   1.4724   1.0217  -(
##
## sigma: 0.188404
## lambda (gene 1): 0.426502
## epsilon (gene 1): -0.224181
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -1.9
```

```
## LSnu (cell 1): -4.7
## LStheta (batch 1): -2.3
## ------------------------------------------------------------
## Iteration 19920 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 153.982
## delta (gene 1): 15.4041
## s (cell 1): 1.01489
## nu (cell 1): 1.16775
## theta (batch 1): 0.0189663
## betas:    0.5927  -0.0504  -0.0620   0.5538   1.1346   0.9049   1.1329   1.3274   0.9622   1.2095  -(
##
## sigma: 0.181932
## lambda (gene 1): 0.350465
## epsilon (gene 1): -0.005185
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2
## LSnu (cell 1): -4.6
## LStheta (batch 1): -2.4
## ------------------------------------------------------------
## Iteration 19960 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 279.47
## delta (gene 1): 14.1411
## s (cell 1): 0.992022
## nu (cell 1): 1.14698
## theta (batch 1): 0.0101116
## betas:    1.2069  -0.0247  -0.0240  -0.0610   1.0354   1.1493   0.7223   1.0140   0.8031   1.1194  -:
##
## sigma: 0.180079
## lambda (gene 1): 1.02655
## epsilon (gene 1): -0.0659262
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.1
## LSdelta (gene 1): -2.1
## LSnu (cell 1): -4.5
## LStheta (batch 1): -2.3
## ------------------------------------------------------------
## End of Burn-in period.
## ------------------------------------------------------------
## ------------------------------------------------------------
## Iteration 20000 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.031
## delta (gene 1): 14.4219
## s (cell 1): 1.06978
## nu (cell 1): 1.10899
## theta (batch 1): 0.00729219
```

```
## betas:     1.3138  -0.2327  -0.2274   0.0702   0.7191   1.0957   0.6483   1.0684   1.5769   0.7232  -(
##
## sigma: 0.190409
## lambda (gene 1): 0.840352
## epsilon (gene 1): 0.20515
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.3
## delta (gene 1): 13.4189
## s (cell 1): 1.37756
## nu (cell 1): 1.07753
## theta (batch 1): 0.0101836
## betas:     1.5765  -0.1901  -0.2456  -0.1065   0.5326   0.7992   0.8520   0.8062   1.4594   0.4337  -(
##
## sigma: 0.18629
## lambda (gene 1): 1.5117
## epsilon (gene 1): 0.166143
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.793
## delta (gene 1): 13.8183
## s (cell 1): 1.11436
## nu (cell 1): 1.12882
## theta (batch 1): 0.00235154
## betas:     0.7157   0.0865   0.2483   0.4331   0.8792   1.3907   1.1260   0.6376   1.3306   0.3503  -:
##
## sigma: 0.18616
## lambda (gene 1): 1.41585
## epsilon (gene 1): 0.204061
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20120 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 276.742
## delta (gene 1): 15.6391
## s (cell 1): 1.17422
## nu (cell 1): 1.09192
## theta (batch 1): 0.00118532
## betas:    1.7925  -0.2005  -0.2292  -0.8590   1.2554   0.2944   1.0547   0.6869   1.3318   0.4760  -(
##
## sigma: 0.18327
## lambda (gene 1): 1.09805
## epsilon (gene 1): 0.305313
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.049
## delta (gene 1): 16.3099
## s (cell 1): 1.03127
## nu (cell 1): 1.07248
## theta (batch 1): 0.000388263
## betas:    1.6259  -0.1794   0.4883  -0.5012   0.2790   0.8585   0.8241   0.9089   1.1461   0.6986  -(
##
## sigma: 0.195012
## lambda (gene 1): 0.906133
## epsilon (gene 1): 0.318399
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.644
## delta (gene 1): 13.9129
## s (cell 1): 1.1563
## nu (cell 1): 1.15398
## theta (batch 1): 0.0022777
## betas:    1.2671  -0.0973   0.0474   0.1381   0.3937   1.1563   0.9158   0.8056   1.4162   0.3958  -(
##
## sigma: 0.183941
## lambda (gene 1): 0.93722
## epsilon (gene 1): 0.203713
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 20240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 123.172
## delta (gene 1): 14.058
## s (cell 1): 1.10345
## nu (cell 1): 1.0766
## theta (batch 1): 0.00249076
## betas:    0.9616    0.0053    0.4993    0.0343    1.2811    0.9659    0.9066    1.1263    0.8410    0.7884   -(
##
## sigma: 0.179455
## lambda (gene 1): 0.346982
## epsilon (gene 1): 0.198413
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 20280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.384
## delta (gene 1): 12.9799
## s (cell 1): 1.06857
## nu (cell 1): 1.09796
## theta (batch 1): 0.00222987
## betas:    1.4265   -0.1358    0.3123   -0.5213    0.6293    1.2709    0.6469    0.8610    1.3403    0.6478   -(
##
## sigma: 0.181464
## lambda (gene 1): 2.74016
## epsilon (gene 1): 0.137168
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 20320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.091
## delta (gene 1): 13.5786
## s (cell 1): 1.08831
## nu (cell 1): 1.02629
## theta (batch 1): 0.00134879
## betas:    0.8020   -0.1870    0.0666    0.2393    0.5087    1.4762    0.8604    1.1436    1.6835    0.8157   -(
##
```

```
## sigma: 0.175367
## lambda (gene 1): 1.19996
## epsilon (gene 1): 0.189948
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 20360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.977
## delta (gene 1): 15.9892
## s (cell 1): 1.08119
## nu (cell 1): 1.09056
## theta (batch 1): 0.00179318
## betas:     1.6707  -0.1493  -0.3937   0.1686   0.6785   0.9898   0.4594   1.0083   1.2311   0.4600  -0
##
## sigma: 0.178448
## lambda (gene 1): 1.32797
## epsilon (gene 1): 0.359014
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 20400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.096
## delta (gene 1): 15.0476
## s (cell 1): 1.15179
## nu (cell 1): 1.06476
## theta (batch 1): 0.00165191
## betas:     1.6207  -0.2174   0.2295   0.1701   0.0679   1.0258   0.8383   0.9166   1.1096   1.2074  -
##
## sigma: 0.181591
## lambda (gene 1): 0.740317
## epsilon (gene 1): 0.259298
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 20440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 230.696
```

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## delta (gene 1): 13.8101
## s (cell 1): 1.2059
## nu (cell 1): 1.15272
## theta (batch 1): 0.0076165
## betas:    1.3042  -0.2640   1.6172  -0.0211   0.4251   0.9553   0.9454   1.1087   1.4832   0.9436  -(
##
## sigma: 0.175203
## lambda (gene 1): 0.920847
## epsilon (gene 1): 0.219736
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 291.952
## delta (gene 1): 13.5963
## s (cell 1): 0.724682
## nu (cell 1): 1.03781
## theta (batch 1): 0.0420355
## betas:    1.3680  -0.1468   0.2171   0.4437   0.1724   0.9438   1.0685   0.7814   1.3653   0.6852  -(
##
## sigma: 0.176727
## lambda (gene 1): 3.79881
## epsilon (gene 1): 0.197445
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.744
## delta (gene 1): 13.3908
## s (cell 1): 0.947376
## nu (cell 1): 1.04784
## theta (batch 1): 0.0682966
## betas:    1.1406  -0.1473   0.4144  -0.2055   0.8341   1.0817   0.9770   1.0614   1.2330   0.8704  -(
##
## sigma: 0.178153
## lambda (gene 1): 0.363185
## epsilon (gene 1): 0.182021
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 20560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.205
## delta (gene 1): 13.9334
## s (cell 1): 1.45865
## nu (cell 1): 1.04372
## theta (batch 1): 0.041212
## betas:    0.6287  -0.2082  -0.4271   0.2576   1.1024   1.3441   0.8580   1.4478   1.4683   1.0937   (
##
## sigma: 0.180005
## lambda (gene 1): 0.87418
## epsilon (gene 1): 0.188888
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 20600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 346.763
## delta (gene 1): 12.0872
## s (cell 1): 1.14618
## nu (cell 1): 1.04242
## theta (batch 1): 0.0186067
## betas:    1.6080  -0.1080   0.2946  -0.1092   0.2602   0.8050   1.1024   0.5685   1.1889   0.6080   -(
##
## sigma: 0.189528
## lambda (gene 1): 0.582911
## epsilon (gene 1): 0.053442
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 20640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 340.438
## delta (gene 1): 12.6171
## s (cell 1): 1.41988
## nu (cell 1): 1.21105
## theta (batch 1): 0.0277336
## betas:    0.6481  -0.1276   0.5188   0.1301   0.8305   1.3006   1.2379   0.8719   1.8568   0.4721   -(
##
## sigma: 0.189168
## lambda (gene 1): 1.8118
```

```
## epsilon (gene 1): 0.121255
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.741
## delta (gene 1): 13.3411
## s (cell 1): 1.19151
## nu (cell 1): 1.0077
## theta (batch 1): 0.0165608
## betas:    1.3567  -0.1554  -0.1484  -0.1595   0.7109   0.9529   0.7468   1.1870   0.9638   1.0607  -0
##
## sigma: 0.178929
## lambda (gene 1): 0.392205
## epsilon (gene 1): 0.140449
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 359.944
## delta (gene 1): 16.5833
## s (cell 1): 1.07721
## nu (cell 1): 1.08633
## theta (batch 1): 0.00363959
## betas:    1.4300  -0.1567  -0.1716   0.0898   0.7763   0.9800   0.6432   1.1061   1.0645   0.9427  -0
##
## sigma: 0.178465
## lambda (gene 1): 0.420401
## epsilon (gene 1): 0.347529
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 106.164
## delta (gene 1): 13.0744
## s (cell 1): 1.02683
```

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## nu (cell 1): 1.10104
## theta (batch 1): 0.00769935
## betas:    1.1911  -0.1507   0.0079   0.3635   1.1318   0.5214   1.1712   0.9058   1.4219   0.6577  -(
##
## sigma: 0.178091
## lambda (gene 1): 0.785209
## epsilon (gene 1): 0.160527
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.318
## delta (gene 1): 13.1777
## s (cell 1): 1.02284
## nu (cell 1): 1.13848
## theta (batch 1): 0.0630239
## betas:    1.3910  -0.1843   0.6244   0.5114  -0.1336   1.3789   0.6419   1.0385   1.3613   0.6572  -(
##
## sigma: 0.187589
## lambda (gene 1): 1.5834
## epsilon (gene 1): 0.140248
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 20840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.2
## delta (gene 1): 12.381
## s (cell 1): 1.21784
## nu (cell 1): 1.0772
## theta (batch 1): 0.0492585
## betas:    1.4415  -0.1202   1.0733  -0.1793   0.5587   1.0688   0.6309   0.9774   1.3257   0.2461  -(
##
## sigma: 0.183594
## lambda (gene 1): 1.14816
## epsilon (gene 1): 0.107441
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
```

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## Iteration 20880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 288.575
## delta (gene 1): 12.1016
## s (cell 1): 0.902913
## nu (cell 1): 1.05338
## theta (batch 1): 0.008711
## betas:    1.6116  -0.1867   0.4651  -0.0154   0.3910   0.8422   1.0399   0.5234   1.7238   0.2528  -(
##
## sigma: 0.167482
## lambda (gene 1): 0.982746
## epsilon (gene 1): 0.0818873
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 20920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.069
## delta (gene 1): 18.3833
## s (cell 1): 1.05953
## nu (cell 1): 0.984049
## theta (batch 1): 0.0283928
## betas:    1.5702  -0.2683   0.1757  -0.1757   0.3931   1.0080   0.6024   1.1543   1.3466   0.8429  -(
##
## sigma: 0.184459
## lambda (gene 1): 0.349154
## epsilon (gene 1): 0.467252
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 20960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 281.391
## delta (gene 1): 14.371
## s (cell 1): 0.948085
## nu (cell 1): 1.0787
## theta (batch 1): 0.0527109
## betas:    0.8522  -0.0672   0.0747  -0.0008   1.5793   0.9365   0.7515   1.3129   1.2937   0.4174  -(
##
## sigma: 0.168941
## lambda (gene 1): 1.3312
## epsilon (gene 1): 0.258196
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 21000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.267
## delta (gene 1): 17.0643
## s (cell 1): 0.951838
## nu (cell 1): 1.03237
## theta (batch 1): 0.0142707
## betas:    1.4781  -0.2856  -0.0844  -0.4943   0.8112   0.5991   1.0675   0.9056   1.5157   1.0273  -0
##
## sigma: 0.184886
## lambda (gene 1): 0.265067
## epsilon (gene 1): 0.405847
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 21040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.131
## delta (gene 1): 16.8291
## s (cell 1): 0.957116
## nu (cell 1): 1.05179
## theta (batch 1): 0.00546996
## betas:    1.7609  -0.1691   0.3668   0.5282   0.1641   0.6741   1.0281   0.6205   1.2444   0.6404  -0
##
## sigma: 0.178243
## lambda (gene 1): 0.89107
## epsilon (gene 1): 0.387546
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 21080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.407
## delta (gene 1): 16.2819
## s (cell 1): 1.0032
## nu (cell 1): 1.07708
## theta (batch 1): 0.00172091
```

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## betas:    2.0966  -0.2989   0.4453  -0.2348   0.3593   0.3870   0.9340   0.7481   1.3068   0.6975  -(
##
## sigma: 0.184514
## lambda (gene 1): 1.02794
## epsilon (gene 1): 0.344464
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 21120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.174
## delta (gene 1): 16.4582
## s (cell 1): 1.03844
## nu (cell 1): 1.07071
## theta (batch 1): 0.00285709
## betas:    1.6378  -0.3005   0.3569  -0.0033   0.1476   0.9383   0.6085   1.3106   1.2051   0.8492   (
##
## sigma: 0.187752
## lambda (gene 1): 0.777127
## epsilon (gene 1): 0.35959
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 21160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 278.662
## delta (gene 1): 18.719
## s (cell 1): 0.992894
## nu (cell 1): 0.987599
## theta (batch 1): 0.00196269
## betas:    1.7891  -0.1573   0.4749   0.1682   0.2231   0.4779   1.2053   0.3575   1.5400   0.2873  -(
##
## sigma: 0.174671
## lambda (gene 1): 1.66768
## epsilon (gene 1): 0.522742
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 21200 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 276.439
## delta (gene 1): 10.3309
## s (cell 1): 1.06934
## nu (cell 1): 1.08205
## theta (batch 1): 0.00516013
## betas:    1.6684  -0.1840   0.6018  -0.4380   0.3361   1.1544   0.5307   1.0347   1.1366   0.6274  -(
##
## sigma: 0.174045
## lambda (gene 1): 0.246695
## epsilon (gene 1): -0.102963
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 21240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 320.877
## delta (gene 1): 11.275
## s (cell 1): 1.13927
## nu (cell 1): 1.04292
## theta (batch 1): 0.00406888
## betas:    1.6900  -0.2121   0.4164   0.3340  -0.4835   1.4665   0.6357   0.6868   1.7022   0.2160  -(
##
## sigma: 0.185703
## lambda (gene 1): 0.882604
## epsilon (gene 1): 0.00103717
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 21280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.466
## delta (gene 1): 17.5492
## s (cell 1): 1.04133
## nu (cell 1): 1.00456
## theta (batch 1): 0.0169043
## betas:    1.3135  -0.0919  -0.1868   0.6782  -0.0962   1.1459   0.9934   0.5999   1.4544   0.5517  -(
##
## sigma: 0.181842
## lambda (gene 1): 0.504331
## epsilon (gene 1): 0.433166
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

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## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 21320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.936
## delta (gene 1): 15.3482
## s (cell 1): 1.33032
## nu (cell 1): 1.04355
## theta (batch 1): 0.0581831
## betas:    1.0652  -0.0907  -0.4867  -0.0696   1.4358   0.8951   0.9570   0.9106   1.4753   0.3940  -(
##
## sigma: 0.181177
## lambda (gene 1): 1.27587
## epsilon (gene 1): 0.338211
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 21360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.441
## delta (gene 1): 12.5165
## s (cell 1): 1.09829
## nu (cell 1): 1.12807
## theta (batch 1): 0.0291148
## betas:    1.1327  -0.0448  -0.3633   0.0246   0.9922   1.3224   0.5857   0.9475   1.4075   0.2694  -(
##
## sigma: 0.17679
## lambda (gene 1): 0.841156
## epsilon (gene 1): 0.121286
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 21400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 356.193
## delta (gene 1): 9.70728
## s (cell 1): 1.82575
## nu (cell 1): 1.11256
## theta (batch 1): 0.0218366
## betas:    1.4130  -0.1484  -0.6225  -0.2046   0.6894   1.2565   0.6559   0.9225   1.4272   0.4719  -(
##
```

```
## sigma: 0.181724
## lambda (gene 1): 2.02035
## epsilon (gene 1): -0.153824
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 21440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 193.786
## delta (gene 1): 11.2263
## s (cell 1): 1.16377
## nu (cell 1): 1.11458
## theta (batch 1): 0.00742423
## betas:    1.4336  -0.2018   0.3774  -0.5210   0.8540   0.6425   1.0560   0.7947   1.6380   0.3142   (
##
## sigma: 0.173212
## lambda (gene 1): 1.16817
## epsilon (gene 1): -0.00388071
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 21480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.957
## delta (gene 1): 15.7582
## s (cell 1): 0.823491
## nu (cell 1): 1.01847
## theta (batch 1): 0.0192379
## betas:    1.4313  -0.2120  -0.4793   0.0982   0.6146   1.2918   0.4211   1.1517   1.4865   0.4881  -(
##
## sigma: 0.18432
## lambda (gene 1): 0.848824
## epsilon (gene 1): 0.329508
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 21520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.065
```

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## delta (gene 1): 20.9464
## s (cell 1): 1.31177
## nu (cell 1): 1.11913
## theta (batch 1): 0.0291145
## betas:    1.6229  -0.1406   0.4823  -0.4414   0.4503   0.9818   0.8981   0.7330   1.2143   0.5422  -(
##
## sigma: 0.183401
## lambda (gene 1): 0.950831
## epsilon (gene 1): 0.624066
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 21560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 289.199
## delta (gene 1): 17.2895
## s (cell 1): 1.31494
## nu (cell 1): 1.14957
## theta (batch 1): 0.0493803
## betas:    1.1931  -0.1262   0.2233   0.3194   0.5402   1.0362   0.7915   1.1378   1.1430   0.7934  -(
##
## sigma: 0.179017
## lambda (gene 1): 1.66883
## epsilon (gene 1): 0.404197
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 21600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 169.879
## delta (gene 1): 14.6905
## s (cell 1): 1.18816
## nu (cell 1): 1.05313
## theta (batch 1): 0.0297788
## betas:    1.4734  -0.2013   0.2711   0.3745   0.3606   0.7377   1.3008   0.4140   1.8496   0.3123  -(
##
## sigma: 0.181457
## lambda (gene 1): 2.3362
## epsilon (gene 1): 0.244875
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 21640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 346.01
## delta (gene 1): 14.9706
## s (cell 1): 0.941211
## nu (cell 1): 0.956779
## theta (batch 1): 0.0133006
## betas:    1.5359   -0.2071    0.4626    0.0360    0.0819    1.2172    0.7078    0.8845    1.3987    0.7275   -(
##
## sigma: 0.170685
## lambda (gene 1): 0.684753
## epsilon (gene 1): 0.25637
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 21680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 135.1
## delta (gene 1): 13.1247
## s (cell 1): 1.05639
## nu (cell 1): 1.06269
## theta (batch 1): 0.00159634
## betas:    1.2598   -0.1549    0.8079    0.5871    0.3600    1.0002    0.8916    0.8968    1.5229    0.5303   -(
##
## sigma: 0.178315
## lambda (gene 1): 0.776717
## epsilon (gene 1): 0.152406
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 21720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.582
## delta (gene 1): 15.5775
## s (cell 1): 1.08649
## nu (cell 1): 1.00045
## theta (batch 1): 0.0016775
## betas:    1.7848   -0.2028   -0.2222    0.2408   -0.0758    1.1538    0.5359    0.8814    1.3958    0.3530   -(
##
## sigma: 0.182422
## lambda (gene 1): 1.00613
```

```
## epsilon (gene 1): 0.317468
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 21760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.432
## delta (gene 1): 15.62
## s (cell 1): 1.02071
## nu (cell 1): 1.09326
## theta (batch 1): 0.0113909
## betas:    1.9700  -0.2717   0.1369  -0.3103   0.0275   1.0631   0.4122   1.1568   1.0798   0.7244  -(
##
## sigma: 0.18267
## lambda (gene 1): 0.697103
## epsilon (gene 1): 0.311164
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 21800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.36
## delta (gene 1): 11.5113
## s (cell 1): 1.02338
## nu (cell 1): 1.06591
## theta (batch 1): 0.00404041
## betas:    1.2610  -0.2972   0.1356  -0.3111   0.8016   0.9245   0.8400   1.3440   1.3527   1.0490   (
##
## sigma: 0.181106
## lambda (gene 1): 0.317565
## epsilon (gene 1): 0.0224445
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 21840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.188
## delta (gene 1): 13.5347
## s (cell 1): 1.14297
```

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## nu (cell 1): 1.08775
## theta (batch 1): 0.0162084
## betas:    1.3175  -0.2913   0.0663   0.3787  -0.2078   1.1987   0.9641   1.0674   1.3927   1.3286  -(
##
## sigma: 0.179237
## lambda (gene 1): 0.817286
## epsilon (gene 1): 0.162813
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 21880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.697
## delta (gene 1): 18.1605
## s (cell 1): 0.802345
## nu (cell 1): 0.961743
## theta (batch 1): 0.025242
## betas:    1.4584  -0.2313   0.1036   0.0069   0.5492   0.9191   0.8110   1.1220   1.2029   0.9513  -(
##
## sigma: 0.182399
## lambda (gene 1): 1.49614
## epsilon (gene 1): 0.474791
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 21920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.052
## delta (gene 1): 17.2934
## s (cell 1): 1.05712
## nu (cell 1): 1.07199
## theta (batch 1): 0.00536591
## betas:    1.0771  -0.2977  -0.5935   0.7417   0.1124   0.8564   1.3331   0.8497   2.0356   0.5969   (
##
## sigma: 0.177341
## lambda (gene 1): 0.922255
## epsilon (gene 1): 0.425764
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
```

```
## Iteration 21960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.902
## delta (gene 1): 12.6628
## s (cell 1): 1.15568
## nu (cell 1): 1.097
## theta (batch 1): 0.00315633
## betas:    1.6691  -0.2088  -0.3446  -0.0508   0.5791   0.9890   0.6457   0.9080   1.4913   0.2697
##
## sigma: 0.184804
## lambda (gene 1): 0.806238
## epsilon (gene 1): 0.123333
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.508
## delta (gene 1): 17.4036
## s (cell 1): 1.29731
## nu (cell 1): 1.1041
## theta (batch 1): 0.00497358
## betas:    1.3118  -0.1619   0.3274   0.4932   0.1522   0.9390   1.1570   0.6335   1.5891   0.6799
##
## sigma: 0.187099
## lambda (gene 1): 0.674696
## epsilon (gene 1): 0.452968
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.49
## delta (gene 1): 12.17
## s (cell 1): 1.14793
## nu (cell 1): 1.15092
## theta (batch 1): 0.00240106
## betas:    1.0056  -0.1218   0.4233   0.3770   0.3575   1.4835   0.6462   1.2396   1.2527   0.8148
##
## sigma: 0.18535
## lambda (gene 1): 1.34914
## epsilon (gene 1): 0.0714697
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.708
## delta (gene 1): 13.9504
## s (cell 1): 1.07408
## nu (cell 1): 1.0984
## theta (batch 1): 0.00122119
## betas:    1.0113  -0.0920  -0.2979  -0.2765   1.3775   1.3328   0.5470   1.2441   1.4150   0.2231  -(
##
## sigma: 0.195164
## lambda (gene 1): 0.556847
## epsilon (gene 1): 0.229459
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.688
## delta (gene 1): 15.1904
## s (cell 1): 1.11863
## nu (cell 1): 1.07055
## theta (batch 1): 0.00119808
## betas:    0.7229  -0.1660  -0.2486   0.4569   1.1207   0.7842   1.2356   1.2017   1.4554   0.8254  (
##
## sigma: 0.177441
## lambda (gene 1): 1.55516
## epsilon (gene 1): 0.281671
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.907
## delta (gene 1): 16.6935
## s (cell 1): 1.07185
## nu (cell 1): 1.04717
## theta (batch 1): 0.00224092
```

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## betas:    1.4561  -0.1960  -0.2657  -0.2633   0.3736   0.6918   1.3748   0.3760   1.8520   0.3039  -(
##
## sigma: 0.183523
## lambda (gene 1): 0.820558
## epsilon (gene 1): 0.377562
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 22200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.149
## delta (gene 1): 13.5794
## s (cell 1): 0.984175
## nu (cell 1): 1.04924
## theta (batch 1): 0.000649338
## betas:    1.0910  -0.1211   0.0875   0.1313   0.2849   1.6016   0.8526   0.7447   1.6528   0.5011  -(
##
## sigma: 0.182533
## lambda (gene 1): 0.910164
## epsilon (gene 1): 0.186279
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 22240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.167
## delta (gene 1): 12.0551
## s (cell 1): 1.17478
## nu (cell 1): 1.17611
## theta (batch 1): 0.000389035
## betas:    1.4911  -0.2303   0.0886  -0.2192   0.4366   0.8430   0.8198   1.1045   1.1605   1.1686  -(
##
## sigma: 0.180511
## lambda (gene 1): 0.549299
## epsilon (gene 1): 0.0320095
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 22280 out of 40000 has been completed.
## --------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 344.296
## delta (gene 1): 13.3074
## s (cell 1): 1.08926
## nu (cell 1): 1.07891
## theta (batch 1): 0.000511244
## betas:    1.1564  -0.1300   0.6230   0.1853   0.4012   1.1956   0.7813   1.1215   1.2892   0.5772  -(
##
## sigma: 0.173135
## lambda (gene 1): 1.38857
## epsilon (gene 1): 0.150743
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 117.746
## delta (gene 1): 13.6992
## s (cell 1): 1.16397
## nu (cell 1): 1.1209
## theta (batch 1): 0.000329807
## betas:    1.2579  -0.1557   0.2146   0.0526   0.6293   1.3785   0.4450   1.4049   0.9575   1.0337  -(
##
## sigma: 0.178449
## lambda (gene 1): 0.891886
## epsilon (gene 1): 0.181643
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.288
## delta (gene 1): 15.6414
## s (cell 1): 0.975543
## nu (cell 1): 1.03496
## theta (batch 1): 0.0019953
## betas:    1.6957  -0.1209  -0.3241  -0.1142   0.2260   0.9163   1.1001   0.1795   1.7888   0.0180  -(
##
## sigma: 0.179584
## lambda (gene 1): 0.418522
## epsilon (gene 1): 0.320144
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.414
## delta (gene 1): 12.9254
## s (cell 1): 1.09589
## nu (cell 1): 1.12267
## theta (batch 1): 0.00288352
## betas:    1.4069  -0.1583   0.6778   0.1213  -0.1870   1.4428   0.6584   1.0272   1.2379   0.6392  -(
##
## sigma: 0.188507
## lambda (gene 1): 0.777061
## epsilon (gene 1): 0.137529
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.131
## delta (gene 1): 15.3055
## s (cell 1): 1.13849
## nu (cell 1): 1.15084
## theta (batch 1): 0.00255521
## betas:    1.4922  -0.2129  -0.4300   0.5495   0.0531   1.0452   1.0167   0.7183   1.6063   0.4310   (
##
## sigma: 0.176862
## lambda (gene 1): 0.612605
## epsilon (gene 1): 0.297625
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 462.164
## delta (gene 1): 13.1534
## s (cell 1): 1.05219
## nu (cell 1): 1.10213
## theta (batch 1): 0.00577721
## betas:    1.5834  -0.1224   1.1274  -0.1031  -0.0847   1.1120   1.0059   0.5264   1.2861   0.7049  -
##
```

```
## sigma: 0.180114
## lambda (gene 1): 1.25225
## epsilon (gene 1): 0.161423
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 22520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 276.523
## delta (gene 1): 13.7228
## s (cell 1): 1.06442
## nu (cell 1): 1.0532
## theta (batch 1): 0.00376048
## betas:    1.3559  -0.2367   0.3602   0.4874  -0.3068   1.4522   0.7005   1.0251   1.5106   0.8125  -(
##
## sigma: 0.17667
## lambda (gene 1): 1.29474
## epsilon (gene 1): 0.19284
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 22560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 226.139
## delta (gene 1): 12.902
## s (cell 1): 1.04582
## nu (cell 1): 1.01614
## theta (batch 1): 0.00617688
## betas:    1.4233  -0.2342   0.2908  -0.0350   0.5840   0.6918   1.1595   0.8129   1.4490   0.9515  -(
##
## sigma: 0.182393
## lambda (gene 1): 2.83799
## epsilon (gene 1): 0.127859
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 22600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.857
```

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## delta (gene 1): 16.3449
## s (cell 1): 0.902809
## nu (cell 1): 1.05257
## theta (batch 1): 0.00851538
## betas:     0.9602  -0.1182   0.0461   0.2311   0.7770   1.1149   1.0254   0.8720   1.6680   0.3361  -(
##
## sigma: 0.175144
## lambda (gene 1): 1.03145
## epsilon (gene 1): 0.392808
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 156.496
## delta (gene 1): 14.8885
## s (cell 1): 1.1638
## nu (cell 1): 1.10451
## theta (batch 1): 0.0148081
## betas:     1.5338  -0.1063   0.0989   0.2546   0.5787   0.9957   0.7005   0.8140   1.3392   0.2737  -(
##
## sigma: 0.175175
## lambda (gene 1): 0.299578
## epsilon (gene 1): 0.264576
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 22680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.117
## delta (gene 1): 16.4037
## s (cell 1): 1.01301
## nu (cell 1): 1.07042
## theta (batch 1): 0.00593053
## betas:     1.4583  -0.2791   0.0414   0.2647   0.1289   1.0710   0.7438   1.2317   1.2362   1.1813  -(
##
## sigma: 0.178932
## lambda (gene 1): 1.06369
## epsilon (gene 1): 0.355265
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 140.776
## delta (gene 1): 13.4363
## s (cell 1): 1.09618
## nu (cell 1): 1.11129
## theta (batch 1): 0.00580575
## betas:    1.8143  -0.2114   0.0457   0.5340  -0.7098   1.6822   0.0710   1.3410   0.9563   0.7713  -(
##
## sigma: 0.180206
## lambda (gene 1): 2.08994
## epsilon (gene 1): 0.187581
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.449
## delta (gene 1): 12.2338
## s (cell 1): 0.885015
## nu (cell 1): 1.02246
## theta (batch 1): 0.0108658
## betas:    1.6307  -0.1921  -0.4373   0.1686   0.4617   0.6896   0.9373   0.8883   1.2340   0.7008  -(
##
## sigma: 0.174557
## lambda (gene 1): 2.40973
## epsilon (gene 1): 0.0716396
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 306.08
## delta (gene 1): 13.5008
## s (cell 1): 1.04237
## nu (cell 1): 1.09902
## theta (batch 1): 0.0170295
## betas:    1.3759  -0.2115  -0.7528  -0.1401   0.4379   0.9587   1.0773   0.7225   1.6887   0.4922  -(
##
## sigma: 0.167916
## lambda (gene 1): 1.1756
```

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## epsilon (gene 1): 0.172189
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 180.927
## delta (gene 1): 13.8281
## s (cell 1): 0.957173
## nu (cell 1): 1.08288
## theta (batch 1): 0.018857
## betas:    1.3650  -0.3038  -1.1238  -0.7817   0.6607   1.1208   0.5253   1.3531   1.5748   0.6292   (
##
## sigma: 0.167328
## lambda (gene 1): 1.26779
## epsilon (gene 1): 0.224231
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.123
## delta (gene 1): 13.4416
## s (cell 1): 1.34508
## nu (cell 1): 1.07911
## theta (batch 1): 0.0278779
## betas:    0.8332  -0.1169   0.1485   0.5893   0.6069   1.1757   1.0611   0.9851   1.6020   0.4663  -(
##
## sigma: 0.179133
## lambda (gene 1): 1.39614
## epsilon (gene 1): 0.154294
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 22920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.819
## delta (gene 1): 16.1906
## s (cell 1): 1.25594
```

```
## nu (cell 1): 1.13505
## theta (batch 1): 0.016099
## betas:    1.1764  -0.1672   0.3770   0.4634   0.7969   0.6674   1.1146   1.0253   1.2713   0.9052  -(
##
## sigma: 0.183337
## lambda (gene 1): 1.7058
## epsilon (gene 1): 0.360255
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 22960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.332
## delta (gene 1): 15.0536
## s (cell 1): 0.951972
## nu (cell 1): 1.08791
## theta (batch 1): 0.0287312
## betas:    1.7867  -0.0835  -0.0433  -0.2570   0.5440   0.6138   0.8508   0.7227   1.0179   0.4371  -(
##
## sigma: 0.185162
## lambda (gene 1): 1.72396
## epsilon (gene 1): 0.294594
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 155.117
## delta (gene 1): 12.7333
## s (cell 1): 1.26383
## nu (cell 1): 1.07031
## theta (batch 1): 0.0222206
## betas:    1.3581  -0.1604  -0.4205  -0.3154   0.8815   1.0253   0.7254   1.0192   1.2788   0.7812  -(
##
## sigma: 0.174988
## lambda (gene 1): 0.425883
## epsilon (gene 1): 0.118238
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
```

```
## Iteration 23040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 380.245
## delta (gene 1): 11.9903
## s (cell 1): 1.00574
## nu (cell 1): 1.09926
## theta (batch 1): 0.0205074
## betas:    1.9367  -0.2170  -0.2597  -0.6967   0.8478   0.5388   0.6957   0.8803   1.0906   0.9059  -(
##
## sigma: 0.187391
## lambda (gene 1): 0.342772
## epsilon (gene 1): 0.0515778
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 23080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.162
## delta (gene 1): 16.2726
## s (cell 1): 1.46025
## nu (cell 1): 1.18114
## theta (batch 1): 0.0158208
## betas:    1.5746  -0.1947   0.6273  -0.5796   0.6375   0.6990   1.3309   0.1294   2.0568   0.2031  -(
##
## sigma: 0.184322
## lambda (gene 1): 0.246622
## epsilon (gene 1): 0.347034
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 23120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.776
## delta (gene 1): 15.9388
## s (cell 1): 1.10963
## nu (cell 1): 1.07211
## theta (batch 1): 0.0231943
## betas:    1.5936  -0.2389  -0.1053  -0.1565   0.6099   0.4102   1.1000   0.8891   1.3132   0.7861  -(
##
## sigma: 0.180035
## lambda (gene 1): 0.569949
## epsilon (gene 1): 0.341549
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.784
## delta (gene 1): 13.7761
## s (cell 1): 1.39628
## nu (cell 1): 0.968017
## theta (batch 1): 0.0981862
## betas:    1.5684  -0.2611   0.6771  -0.5049   0.2697   1.2806   0.4796   1.1646   1.4435   0.6017  -(
##
## sigma: 0.182973
## lambda (gene 1): 0.421071
## epsilon (gene 1): 0.207185
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.036
## delta (gene 1): 14.5289
## s (cell 1): 1.54195
## nu (cell 1): 1.05543
## theta (batch 1): 0.0763691
## betas:    1.1264  -0.1560   0.8186   0.5966   0.3371   1.3484   0.6074   1.2650   1.2814   0.7204  -(
##
## sigma: 0.179327
## lambda (gene 1): 0.505919
## epsilon (gene 1): 0.241202
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 404.748
## delta (gene 1): 13.3766
## s (cell 1): 1.16228
## nu (cell 1): 1.10505
## theta (batch 1): 0.0493878
```

```
## betas:     1.2276  -0.1554   0.8053   0.5750   0.4543   1.0623   0.7770   1.2154   1.0665   1.0996  -(
##
## sigma: 0.175549
## lambda (gene 1): 1.1184
## epsilon (gene 1): 0.178553
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 23280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 150.748
## delta (gene 1): 11.1342
## s (cell 1): 0.851608
## nu (cell 1): 0.986738
## theta (batch 1): 0.0327238
## betas:     1.5728  -0.2007   0.7022   1.0294  -0.1371   0.9037   0.9984   0.5830   1.6655   0.4922  -(
##
## sigma: 0.166514
## lambda (gene 1): 2.27104
## epsilon (gene 1): -0.0375996
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 23320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 126.884
## delta (gene 1): 11.0788
## s (cell 1): 1.42519
## nu (cell 1): 1.15836
## theta (batch 1): 0.0310688
## betas:     1.0806  -0.2439   0.5413   0.0527   0.3393   0.9728   1.1646   0.9749   1.6872   0.7747  (
##
## sigma: 0.170575
## lambda (gene 1): 1.49541
## epsilon (gene 1): -0.018777
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 23360 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.771
## delta (gene 1): 13.3965
## s (cell 1): 0.941496
## nu (cell 1): 1.09129
## theta (batch 1): 0.0195605
## betas:    1.6620  -0.2058  -0.0449   0.0925   0.6073   0.9164   0.5330   1.1757   1.1010   0.6936  -(
##
## sigma: 0.171027
## lambda (gene 1): 0.850309
## epsilon (gene 1): 0.15284
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 23400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.927
## delta (gene 1): 15.8463
## s (cell 1): 1.01434
## nu (cell 1): 1.01337
## theta (batch 1): 0.00942824
## betas:    1.4649  -0.2130  -0.5125   0.1930   0.5988   0.9579   0.5574   1.3172   1.1167   0.8386  -(
##
## sigma: 0.178376
## lambda (gene 1): 2.49728
## epsilon (gene 1): 0.343843
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 23440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.898
## delta (gene 1): 16.7049
## s (cell 1): 1.33428
## nu (cell 1): 1.11253
## theta (batch 1): 0.00708278
## betas:    1.8210  -0.1678  -0.5196   0.2707   0.2228   0.8480   0.6826   0.8928   1.1263   0.5361  -(
##
## sigma: 0.176439
## lambda (gene 1): 1.16661
## epsilon (gene 1): 0.387069
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 23480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 202.59
## delta (gene 1): 15.7666
## s (cell 1): 0.895535
## nu (cell 1): 1.08624
## theta (batch 1): 0.00545854
## betas:    1.2890  -0.0983   0.0391  -0.2074   1.1829   0.2852   1.3813   0.6377   1.3608   0.4860  -0
##
## sigma: 0.167662
## lambda (gene 1): 2.20065
## epsilon (gene 1): 0.325446
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 23520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.443
## delta (gene 1): 14.5201
## s (cell 1): 1.1688
## nu (cell 1): 1.05365
## theta (batch 1): 0.00313004
## betas:    1.3949  -0.1971  -0.8902   0.3066   0.5703   0.9306   0.8290   1.2033   1.0521   0.9456  -0
##
## sigma: 0.18324
## lambda (gene 1): 2.28038
## epsilon (gene 1): 0.23624
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 23560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.56
## delta (gene 1): 15.8537
## s (cell 1): 1.05859
## nu (cell 1): 1.08437
## theta (batch 1): 0.00247748
## betas:    1.0787  -0.1589  -0.2167   0.2955   0.3304   1.1885   1.1781   0.7167   1.5677   0.9555  -0
##
```

```
## sigma: 0.182726
## lambda (gene 1): 1.3151
## epsilon (gene 1): 0.341513
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.546
## delta (gene 1): 17.2125
## s (cell 1): 1.12121
## nu (cell 1): 1.05935
## theta (batch 1): 0.00880499
## betas:     1.6174   -0.1103    0.0222    0.3382    0.2148    1.2264    0.6093    0.7925    1.2252    0.5284   -(
##
## sigma: 0.179651
## lambda (gene 1): 2.89735
## epsilon (gene 1): 0.420589
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 244.222
## delta (gene 1): 14.3217
## s (cell 1): 0.885295
## nu (cell 1): 1.06635
## theta (batch 1): 0.0183475
## betas:     1.8166   -0.2470   -0.0035   -0.1926   -0.1002    1.0943    0.7725    0.6810    1.5397    0.6720   -(
##
## sigma: 0.184736
## lambda (gene 1): 0.206571
## epsilon (gene 1): 0.218405
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.339
```

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## delta (gene 1): 15.0361
## s (cell 1): 1.14235
## nu (cell 1): 1.04395
## theta (batch 1): 0.01446
## betas:    1.3023  -0.2228   0.0447   0.6348   0.2475   1.0414   0.8288   1.0646   1.4934   0.5885
##
## sigma: 0.179609
## lambda (gene 1): 0.487941
## epsilon (gene 1): 0.290188
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.964
## delta (gene 1): 10.7042
## s (cell 1): 0.911821
## nu (cell 1): 1.00041
## theta (batch 1): 0.029807
## betas:    1.8138  -0.3064   0.7208  -0.5896   0.5160   0.8799   0.5752   1.1066   1.3275   0.7973  -
##
## sigma: 0.171761
## lambda (gene 1): 0.954532
## epsilon (gene 1): -0.0456411
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 213.142
## delta (gene 1): 12.195
## s (cell 1): 1.38044
## nu (cell 1): 1.06252
## theta (batch 1): 0.0595716
## betas:    1.0484  -0.1783   0.1416   0.6296   0.7417   0.6889   1.2223   0.9473   1.4704   0.9038  -
##
## sigma: 0.181346
## lambda (gene 1): 0.520667
## epsilon (gene 1): 0.0548757
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

```
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 188.777
## delta (gene 1): 15.1482
## s (cell 1): 1.01986
## nu (cell 1): 1.09118
## theta (batch 1): 0.0212591
## betas:    1.7287  -0.2000   0.7229  -0.1765   0.1392   1.0819   0.4494   1.1572   1.0174   0.8505  -(
##
## sigma: 0.170676
## lambda (gene 1): 1.69872
## epsilon (gene 1): 0.291818
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 413.573
## delta (gene 1): 13.6432
## s (cell 1): 1.22589
## nu (cell 1): 1.06773
## theta (batch 1): 0.0380897
## betas:    0.8921  -0.1592   0.6371   0.1702   0.7075   0.8068   1.4291   0.8602   1.6380   0.6448  -(
##
## sigma: 0.182934
## lambda (gene 1): 0.578856
## epsilon (gene 1): 0.185196
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.852
## delta (gene 1): 18.5536
## s (cell 1): 0.983267
## nu (cell 1): 1.1207
## theta (batch 1): 0.0358491
## betas:    2.1040  -0.3513   0.4331  -1.0194   0.1373   0.7792   0.6009   0.9976   1.2741   0.9018  -(
##
## sigma: 0.175567
## lambda (gene 1): 0.916954
```

```
## epsilon (gene 1): 0.490792
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 168.371
## delta (gene 1): 11.6136
## s (cell 1): 1.11301
## nu (cell 1): 1.0469
## theta (batch 1): 0.0207059
## betas:    1.9129  -0.2015   0.9719  -0.1531  -0.0161   1.1747   0.5831   0.7262   1.4037   0.2335  -(
##
## sigma: 0.181708
## lambda (gene 1): 0.555662
## epsilon (gene 1): 0.0190293
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 23960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.854
## delta (gene 1): 11.2333
## s (cell 1): 1.10117
## nu (cell 1): 1.0965
## theta (batch 1): 0.015426
## betas:    1.8688  -0.2090  -0.2688  -0.0004   0.2460   1.0947   0.4925   0.9840   1.0906   0.6961  -(
##
## sigma: 0.188996
## lambda (gene 1): 1.70929
## epsilon (gene 1): -0.0367855
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 24000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 161.843
## delta (gene 1): 11.5164
## s (cell 1): 0.901602
```

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## nu (cell 1): 1.10533
## theta (batch 1): 0.0246282
## betas:    1.3481  -0.2174   0.0971  -0.4780   0.6370   1.3043   0.4335   1.3591   1.1728   0.9656  -(
##
## sigma: 0.182358
## lambda (gene 1): 0.493368
## epsilon (gene 1): 0.0105416
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.289
## delta (gene 1): 17.1392
## s (cell 1): 1.62747
## nu (cell 1): 1.05124
## theta (batch 1): 0.04494
## betas:    1.9003  -0.1623  -0.0382  -0.2893   0.6012   0.3988   0.9239   0.7819   0.9946   0.5840  -(
##
## sigma: 0.179751
## lambda (gene 1): 2.01002
## epsilon (gene 1): 0.417082
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 273.735
## delta (gene 1): 17.0284
## s (cell 1): 0.852472
## nu (cell 1): 1.13414
## theta (batch 1): 0.0375508
## betas:    1.5756  -0.1788   0.2491  -0.1157   0.2148   1.0287   0.9323   0.6629   1.4262   0.6261  -(
##
## sigma: 0.171691
## lambda (gene 1): 1.4676
## epsilon (gene 1): 0.387399
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
```

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## Iteration 24120 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.267
## delta (gene 1): 12.8645
## s (cell 1): 1.39947
## nu (cell 1): 1.03325
## theta (batch 1): 0.0248076
## betas:    1.3824  -0.2601  -0.0797   0.4550   0.2100   0.8412   1.0356   1.1236   1.2080   1.1900  -(
##
## sigma: 0.174817
## lambda (gene 1): 3.07213
## epsilon (gene 1): 0.120579
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 24160 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.007
## delta (gene 1): 13.3517
## s (cell 1): 1.25542
## nu (cell 1): 1.01749
## theta (batch 1): 0.0221247
## betas:    1.3937  -0.1790   0.4888  -0.1088   0.4351   1.1098   0.6105   1.1887   1.2028   0.7789  -(
##
## sigma: 0.185265
## lambda (gene 1): 2.20228
## epsilon (gene 1): 0.164744
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 24200 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.335
## delta (gene 1): 17.5909
## s (cell 1): 1.13667
## nu (cell 1): 1.04193
## theta (batch 1): 0.00977341
## betas:    1.8113  -0.1798   0.0328   0.0159   0.3588   1.0144   0.5866   0.7394   1.3939   0.4044  -(
##
## sigma: 0.176132
## lambda (gene 1): 0.889199
## epsilon (gene 1): 0.427309
## -----------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 282.523
## delta (gene 1): 11.2763
## s (cell 1): 0.885807
## nu (cell 1): 1.02228
## theta (batch 1): 0.0110611
## betas:    1.8952  -0.2481   0.3886  -0.2266  -0.1315   1.1119   0.7554   0.5521   1.6640   0.4565  -(
##
## sigma: 0.180346
## lambda (gene 1): 1.59378
## epsilon (gene 1): 0.013229
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 275.182
## delta (gene 1): 22.7063
## s (cell 1): 0.942201
## nu (cell 1): 1.06226
## theta (batch 1): 0.0182549
## betas:    2.1657  -0.1694   0.3288  -0.3191   0.5902   0.3513   1.1180   0.1272   1.4404   0.3687  -(
##
## sigma: 0.184573
## lambda (gene 1): 0.510308
## epsilon (gene 1): 0.690269
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.636
## delta (gene 1): 17.1788
## s (cell 1): 0.892647
## nu (cell 1): 0.950099
## theta (batch 1): 0.0177571
```

```
## betas:     1.9608   -0.2235    0.2693    0.3513    0.0157    0.7712    0.6930    0.9210    1.0843    0.6481   -(
##
## sigma: 0.183649
## lambda (gene 1): 1.44921
## epsilon (gene 1): 0.399117
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 24360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.908
## delta (gene 1): 13.1105
## s (cell 1): 0.732228
## nu (cell 1): 1.02915
## theta (batch 1): 0.0371417
## betas:     1.3708   -0.1792    0.1605    0.3167    0.4809    0.7820    1.1262    0.8102    1.4169    0.6149   -(
##
## sigma: 0.174097
## lambda (gene 1): 3.3371
## epsilon (gene 1): 0.134864
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 24400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 136.583
## delta (gene 1): 12.689
## s (cell 1): 0.864881
## nu (cell 1): 1.14134
## theta (batch 1): 0.0675168
## betas:     1.2280   -0.1101   -0.4229    0.8242    0.0916    1.2427    0.9385    0.8778    1.2397    0.7887   -(
##
## sigma: 0.180937
## lambda (gene 1): 0.60106
## epsilon (gene 1): 0.113439
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 24440 out of 40000 has been completed.
## --------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 204.444
## delta (gene 1): 14.7064
## s (cell 1): 0.963763
## nu (cell 1): 1.09685
## theta (batch 1): 0.0214049
## betas:    1.2464  -0.0383  -0.1623   0.2121   0.8796   0.6196   1.1475   0.7769   1.1525   0.4942  -(
##
## sigma: 0.178025
## lambda (gene 1): 1.50984
## epsilon (gene 1): 0.274053
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 322.187
## delta (gene 1): 10.4928
## s (cell 1): 0.950831
## nu (cell 1): 1.01869
## theta (batch 1): 0.0244008
## betas:    1.5021  -0.1414   0.2016   0.2336   0.6090   0.6965   0.9726   0.8544   1.2832   0.3122   (
##
## sigma: 0.171265
## lambda (gene 1): 0.49386
## epsilon (gene 1): -0.0892999
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 308.654
## delta (gene 1): 10.8776
## s (cell 1): 1.11338
## nu (cell 1): 1.05107
## theta (batch 1): 0.00708601
## betas:    0.8714  -0.1377   0.6627  -0.0896   1.1296   1.0476   0.8567   1.3584   1.1369   1.0567  -(
##
## sigma: 0.175116
## lambda (gene 1): 1.13258
## epsilon (gene 1): -0.0462385
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

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## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 24560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 298.054
## delta (gene 1): 13.8522
## s (cell 1): 0.997194
## nu (cell 1): 1.05141
## theta (batch 1): 0.00831261
## betas:    1.5201  -0.2014   0.1778  -0.4502   0.6480   1.0566   0.6612   0.9268   1.4811   0.5953  -(
##
## sigma: 0.179648
## lambda (gene 1): 0.824329
## epsilon (gene 1): 0.18989
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 24600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.725
## delta (gene 1): 15.8264
## s (cell 1): 1.14281
## nu (cell 1): 1.12656
## theta (batch 1): 0.00537695
## betas:    1.3131  -0.1898   0.3232  -0.5371   0.9890   0.7291   1.1600   0.6966   1.6025   0.7294  -(
##
## sigma: 0.177035
## lambda (gene 1): 1.53834
## epsilon (gene 1): 0.345707
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 24640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 149.75
## delta (gene 1): 15.8156
## s (cell 1): 1.17521
## nu (cell 1): 1.10958
## theta (batch 1): 0.00709923
## betas:    1.1779  -0.1462   0.3023  -0.0332   0.5470   1.1023   0.9500   0.8626   1.5946   0.4822  -(
##
```

```
## sigma: 0.183979
## lambda (gene 1): 0.228348
## epsilon (gene 1): 0.354162
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 24680 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.089
## delta (gene 1): 16.2737
## s (cell 1): 1.05015
## nu (cell 1): 1.1474
## theta (batch 1): 0.0164949
## betas:    1.2609  -0.3298  -0.3306  -0.3446   0.4919   1.0555   0.8364   1.2508   1.6072   0.9820
##
## sigma: 0.173031
## lambda (gene 1): 1.51074
## epsilon (gene 1): 0.361062
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 24720 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 265.024
## delta (gene 1): 15.9804
## s (cell 1): 1.05008
## nu (cell 1): 1.14518
## theta (batch 1): 0.038191
## betas:    0.9901  -0.0941   0.1667   0.7714   0.4956   1.3334   0.9725   0.8102   1.5176   0.6448  -0
##
## sigma: 0.18085
## lambda (gene 1): 1.31741
## epsilon (gene 1): 0.326586
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 24760 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.869
```

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## delta (gene 1): 13.5657
## s (cell 1): 1.18398
## nu (cell 1): 1.08949
## theta (batch 1): 0.0152614
## betas:    1.6395  -0.3391  -0.1382   0.1091   0.0231   0.9643   0.7736   1.1858   1.3940   0.9144
##
## sigma: 0.185066
## lambda (gene 1): 0.714161
## epsilon (gene 1): 0.163409
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 24800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 126.465
## delta (gene 1): 20.401
## s (cell 1): 0.948261
## nu (cell 1): 0.997994
## theta (batch 1): 0.00891499
## betas:    1.9460  -0.2401   0.6188  -0.2050   0.6823   0.4506   0.8230   0.7607   1.3983   0.4253  -
##
## sigma: 0.181548
## lambda (gene 1): 2.11756
## epsilon (gene 1): 0.577313
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 24840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.25
## delta (gene 1): 14.3088
## s (cell 1): 1.26663
## nu (cell 1): 1.16446
## theta (batch 1): 0.0196054
## betas:    1.6733  -0.2077   0.0575   0.2637   0.4328   0.6070   0.9266   0.8326   1.3282   0.6003  -
##
## sigma: 0.182842
## lambda (gene 1): 0.596715
## epsilon (gene 1): 0.23385
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.985
## delta (gene 1): 13.6458
## s (cell 1): 0.914801
## nu (cell 1): 1.01159
## theta (batch 1): 0.0330258
## betas:    1.6805  -0.2253  -0.4186  -0.0500   0.4305   0.8742   0.6443   1.0299   1.3092   0.6786  -(
##
## sigma: 0.176734
## lambda (gene 1): 0.984933
## epsilon (gene 1): 0.198941
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.092
## delta (gene 1): 11.4994
## s (cell 1): 1.28061
## nu (cell 1): 1.0524
## theta (batch 1): 0.0390539
## betas:    1.1271  -0.1931   0.4982  -0.0685   0.3694   1.2161   0.7171   1.2475   1.3836   0.8072  -(
##
## sigma: 0.18362
## lambda (gene 1): 0.76694
## epsilon (gene 1): -0.0143214
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 24960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.137
## delta (gene 1): 12.4061
## s (cell 1): 1.08623
## nu (cell 1): 0.936178
## theta (batch 1): 0.0733625
## betas:    1.4118  -0.0947  -0.1934   0.1064   0.3022   1.3155   0.6317   0.9431   1.1455   0.5307  -(
##
## sigma: 0.186765
## lambda (gene 1): 1.85355
```

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## epsilon (gene 1): 0.0599906
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 25000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.769
## delta (gene 1): 13.7677
## s (cell 1): 1.34312
## nu (cell 1): 1.06005
## theta (batch 1): 0.0294046
## betas:    1.3980  -0.1543  -0.3466  -0.1561   0.7346   0.9598   0.7140   1.1173   1.1624   0.6614  -(
##
## sigma: 0.179312
## lambda (gene 1): 1.83629
## epsilon (gene 1): 0.181599
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 25040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.763
## delta (gene 1): 20.6706
## s (cell 1): 1.00444
## nu (cell 1): 1.04635
## theta (batch 1): 0.0334295
## betas:    1.0441  -0.1288  -0.3505   0.0432   1.3430   0.5902   1.1720   0.9324   1.4589   0.6489  -(
##
## sigma: 0.17968
## lambda (gene 1): 2.41716
## epsilon (gene 1): 0.594935
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 25080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.246
## delta (gene 1): 12.9037
## s (cell 1): 0.961478
```

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## nu (cell 1): 1.00465
## theta (batch 1): 0.0793535
## betas:    1.6660  -0.1733   0.3777   0.2824  -0.2932   1.2967   0.8524   0.5063   1.5403   0.6393  -(
##
## sigma: 0.178562
## lambda (gene 1): 1.82984
## epsilon (gene 1): 0.116499
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.716
## delta (gene 1): 20.0254
## s (cell 1): 1.21306
## nu (cell 1): 1.06951
## theta (batch 1): 0.0675035
## betas:    1.0893  -0.0501   0.0482   0.3855   0.8514   1.0865   0.7510   1.0026   1.2744   0.5191  -(
##
## sigma: 0.174947
## lambda (gene 1): 0.59304
## epsilon (gene 1): 0.585958
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 189.816
## delta (gene 1): 13.6421
## s (cell 1): 1.45201
## nu (cell 1): 1.07707
## theta (batch 1): 0.0536008
## betas:    1.1353  -0.1043   0.0542   0.0617   0.9261   0.9912   1.0724   0.7112   1.4955   0.6559  -(
##
## sigma: 0.178468
## lambda (gene 1): 1.84207
## epsilon (gene 1): 0.179443
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
```

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## Iteration 25200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.101
## delta (gene 1): 13.8996
## s (cell 1): 1.13517
## nu (cell 1): 1.09087
## theta (batch 1): 0.0516683
## betas:    1.4725  -0.2024  -0.3134  -0.4217   0.5581   1.2016   0.7825   0.8452   1.4848   0.7114  -(
##
## sigma: 0.184892
## lambda (gene 1): 1.58721
## epsilon (gene 1): 0.189493
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 264.065
## delta (gene 1): 13.7133
## s (cell 1): 0.935527
## nu (cell 1): 1.05472
## theta (batch 1): 0.0222085
## betas:    1.1770  -0.0962  -0.4634  -0.0399   1.1573   1.0314   0.6767   1.1705   1.1835   0.5060  -(
##
## sigma: 0.181007
## lambda (gene 1): 0.892562
## epsilon (gene 1): 0.200797
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.056
## delta (gene 1): 16.7606
## s (cell 1): 1.09398
## nu (cell 1): 1.04748
## theta (batch 1): 0.0197079
## betas:    1.5223  -0.1237   0.2207   0.4314   0.0772   1.2411   0.8897   0.3992   1.8380  -0.0331  -(
##
## sigma: 0.173495
## lambda (gene 1): 0.230591
## epsilon (gene 1): 0.416864
## -------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 25320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.009
## delta (gene 1): 12.515
## s (cell 1): 1.311
## nu (cell 1): 1.0453
## theta (batch 1): 0.058545
## betas:    1.2904  -0.1221   0.3052   0.0730   0.9049   0.5817   1.1994   0.6743   1.5642   0.3460  -(
##
## sigma: 0.187274
## lambda (gene 1): 1.89817
## epsilon (gene 1): 0.116123
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 25360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.664
## delta (gene 1): 13.204
## s (cell 1): 0.95516
## nu (cell 1): 1.09343
## theta (batch 1): 0.0684367
## betas:    1.3546  -0.1433  -0.0047   0.4377  -0.0282   1.2740   0.9528   0.6455   1.5470   0.6421  -(
##
## sigma: 0.184701
## lambda (gene 1): 0.305192
## epsilon (gene 1): 0.123593
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 25400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.634
## delta (gene 1): 12.2604
## s (cell 1): 0.905731
## nu (cell 1): 1.16886
## theta (batch 1): 0.0503356
```

```
## betas:     1.4234  -0.1865  -0.0524   0.1645   0.0065   1.1945   0.7953   1.0356   1.1728   0.8550  -(
##
## sigma: 0.186609
## lambda (gene 1): 0.55245
## epsilon (gene 1): 0.0733758
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 166.561
## delta (gene 1): 13.0198
## s (cell 1): 0.921283
## nu (cell 1): 1.07591
## theta (batch 1): 0.0326921
## betas:     1.3779  -0.1623   0.0089  -0.4393   0.4507   1.2244   0.5368   1.0745   1.4691   0.3873  -(
##
## sigma: 0.176667
## lambda (gene 1): 1.02274
## epsilon (gene 1): 0.146539
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 278.484
## delta (gene 1): 13.4788
## s (cell 1): 1.08996
## nu (cell 1): 1.13891
## theta (batch 1): 0.0292579
## betas:     1.0306  -0.0894  -0.2311   0.2998   0.8376   1.0244   0.7173   1.5138   0.7166   1.0905  -(
##
## sigma: 0.1805
## lambda (gene 1): 2.06546
## epsilon (gene 1): 0.162548
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25520 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 176.956
## delta (gene 1): 15.3818
## s (cell 1): 1.14976
## nu (cell 1): 1.13858
## theta (batch 1): 0.0122107
## betas:    1.3988  -0.1742  -0.3185   0.3984   0.1338   1.4416   0.5356   1.0202   1.4399   0.5474  -(
##
## sigma: 0.184346
## lambda (gene 1): 0.533826
## epsilon (gene 1): 0.311773
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.174
## delta (gene 1): 11.7441
## s (cell 1): 1.13515
## nu (cell 1): 1.1102
## theta (batch 1): 0.00720282
## betas:    1.7120  -0.2233   0.0015  -0.1889   0.6527   0.4672   1.1704   0.5505   1.4993   0.7218  -(
##
## sigma: 0.17453
## lambda (gene 1): 2.18357
## epsilon (gene 1): 0.0133077
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 25600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 384.421
## delta (gene 1): 13.8888
## s (cell 1): 0.963095
## nu (cell 1): 1.07559
## theta (batch 1): 0.00744316
## betas:    1.2582  -0.2652  -0.8166   0.1957   0.7686   0.8741   0.7005   1.5399   1.0994   1.2571  -(
##
## sigma: 0.189376
## lambda (gene 1): 2.75633
## epsilon (gene 1): 0.220817
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

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## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 25640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 274.189
## delta (gene 1): 13.7438
## s (cell 1): 1.24902
## nu (cell 1): 1.04171
## theta (batch 1): 0.0198758
## betas:    1.4763  -0.3039  -0.0792   0.0237   0.3901   0.6284   1.0975   1.0583   1.3862   1.0795  -(
##
## sigma: 0.181587
## lambda (gene 1): 1.27876
## epsilon (gene 1): 0.187111
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 25680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.326
## delta (gene 1): 12.8833
## s (cell 1): 1.09525
## nu (cell 1): 1.11868
## theta (batch 1): 0.017336
## betas:    1.5230  -0.2662  -0.3395   0.2423   0.5095   0.5801   1.2160   0.8298   1.4192   0.9360  -(
##
## sigma: 0.185606
## lambda (gene 1): 1.23478
## epsilon (gene 1): 0.121906
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 25720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.448
## delta (gene 1): 10.7171
## s (cell 1): 1.23123
## nu (cell 1): 1.07291
## theta (batch 1): 0.0213044
## betas:    1.2380  -0.1841  -0.3070   0.4622   0.7069   0.9233   0.6249   1.4950   0.9533   1.0252  -(
##
```

```
## sigma: 0.184567
## lambda (gene 1): 1.4065
## epsilon (gene 1): -0.0677706
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 25760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 232.933
## delta (gene 1): 18.5793
## s (cell 1): 1.09978
## nu (cell 1): 1.13217
## theta (batch 1): 0.0218068
## betas:    1.6010  -0.3130   0.3456  -0.3586   0.0272   1.3333   0.5191   1.1909   1.3831   0.9920  -(
##
## sigma: 0.186003
## lambda (gene 1): 0.993731
## epsilon (gene 1): 0.476813
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 25800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.708
## delta (gene 1): 11.3893
## s (cell 1): 0.676561
## nu (cell 1): 1.06164
## theta (batch 1): 0.0880527
## betas:    2.0476  -0.1469   0.6675   0.3852   0.0816   0.6156   1.1339   0.1779   1.3607   0.4361  -(
##
## sigma: 0.18849
## lambda (gene 1): 1.4269
## epsilon (gene 1): -0.0250845
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 25840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 121.187
```

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## delta (gene 1): 14.7767
## s (cell 1): 1.0592
## nu (cell 1): 1.04884
## theta (batch 1): 0.157233
## betas:    2.1342  -0.3278  -0.0424   0.3435  -0.4320   1.0554   0.4207   1.0463   1.1806   0.9056  -
##
## sigma: 0.190053
## lambda (gene 1): 0.789386
## epsilon (gene 1): 0.273948
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 25880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 249.634
## delta (gene 1): 15.2248
## s (cell 1): 1.06901
## nu (cell 1): 1.09593
## theta (batch 1): 0.0896693
## betas:    1.6776  -0.1803   0.4484   0.5865   0.2394   0.5124   0.9792   0.7961   1.2048   0.7136  -
##
## sigma: 0.182265
## lambda (gene 1): 0.234265
## epsilon (gene 1): 0.303454
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 25920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.256
## delta (gene 1): 15.7729
## s (cell 1): 2.10727
## nu (cell 1): 1.13835
## theta (batch 1): 0.122086
## betas:    1.5020  -0.1020   0.5551   0.3936   0.1188   1.2232   0.6760   0.7632   1.3889   0.2730  -
##
## sigma: 0.188546
## lambda (gene 1): 0.433716
## epsilon (gene 1): 0.311959
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 25960 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 211.233
## delta (gene 1): 12.358
## s (cell 1): 1.06982
## nu (cell 1): 1.03931
## theta (batch 1): 0.046046
## betas:    1.4281  -0.2418  -0.4450   0.3348   0.2347   0.8200   1.2411   0.5392   1.8877   0.4277  (
##
## sigma: 0.173824
## lambda (gene 1): 0.404395
## epsilon (gene 1): 0.0929267
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 26000 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 143.754
## delta (gene 1): 12.5632
## s (cell 1): 0.958099
## nu (cell 1): 0.995207
## theta (batch 1): 0.0314646
## betas:    1.3671  -0.2159  -0.1772  -0.0506   0.7990   0.7189   1.2673   0.5528   1.8044   0.5212  -(
##
## sigma: 0.184642
## lambda (gene 1): 0.483217
## epsilon (gene 1): 0.0851735
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 26040 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.835
## delta (gene 1): 16.7993
## s (cell 1): 1.09429
## nu (cell 1): 1.07907
## theta (batch 1): 0.0113821
## betas:    0.4277  -0.0964   0.5212   0.3536   0.9365   1.0839   1.4417   1.1117   1.3180   1.2759  -(
##
## sigma: 0.171767
## lambda (gene 1): 2.55335
```

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## epsilon (gene 1): 0.387918
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.147
## delta (gene 1): 15.6299
## s (cell 1): 1.10588
## nu (cell 1): 1.08426
## theta (batch 1): 0.0215175
## betas:    0.8779  -0.1968   0.2240   0.6613   0.3831   1.2793   0.9489   1.2780   1.4116   0.9511  -(
##
## sigma: 0.191134
## lambda (gene 1): 1.98624
## epsilon (gene 1): 0.334566
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 318.872
## delta (gene 1): 15.9836
## s (cell 1): 1.01439
## nu (cell 1): 1.0779
## theta (batch 1): 0.0199981
## betas:    1.7011  -0.1342  -0.6471   0.0912   0.4406   0.7983   0.7865   0.9748   0.7841   1.0618  -
##
## sigma: 0.192113
## lambda (gene 1): 1.01401
## epsilon (gene 1): 0.35205
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.058
## delta (gene 1): 14.0227
## s (cell 1): 1.01918
```

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## nu (cell 1): 1.07424
## theta (batch 1): 0.0290074
## betas:    1.2925  -0.2551   0.2989   0.2932   0.6017   0.6714   1.2827   0.7415   1.7304   0.7725  -(
##
## sigma: 0.176952
## lambda (gene 1): 1.24265
## epsilon (gene 1): 0.19347
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.165
## delta (gene 1): 14.97
## s (cell 1): 1.49345
## nu (cell 1): 1.09495
## theta (batch 1): 0.0315332
## betas:    1.7347  -0.2402   0.1332  -0.0940   0.4382   0.6639   0.9137   0.7712   1.4684   0.5453  -(
##
## sigma: 0.179294
## lambda (gene 1): 1.67016
## epsilon (gene 1): 0.271637
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 146.924
## delta (gene 1): 14.4039
## s (cell 1): 0.993855
## nu (cell 1): 1.04464
## theta (batch 1): 0.0126735
## betas:    1.3065  -0.2880   0.3534  -0.4045   0.2224   1.2565   0.7425   1.2256   1.4666   1.0061  -(
##
## sigma: 0.179401
## lambda (gene 1): 0.95248
## epsilon (gene 1): 0.227849
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
```

```
## Iteration 26280 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.355
## delta (gene 1): 17.6673
## s (cell 1): 1.23914
## nu (cell 1): 1.02983
## theta (batch 1): 0.0154357
## betas:    1.8814  -0.2519   0.1839   0.2322   0.3532   0.2602   1.1506   0.7250   1.3035   0.7739  -(
##
## sigma: 0.177824
## lambda (gene 1): 0.544395
## epsilon (gene 1): 0.443879
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 26320 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.679
## delta (gene 1): 13.8704
## s (cell 1): 1.15568
## nu (cell 1): 1.03146
## theta (batch 1): 0.0186468
## betas:    2.4556  -0.2266   0.0386   0.5126  -0.5080   0.9085   0.4593   0.6713   0.9780   0.5752  -(
##
## sigma: 0.179366
## lambda (gene 1): 0.471798
## epsilon (gene 1): 0.197841
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 26360 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.43
## delta (gene 1): 14.2241
## s (cell 1): 0.930614
## nu (cell 1): 0.999048
## theta (batch 1): 0.00370463
## betas:    1.5953  -0.2320   0.0414  -0.4927   0.9049   0.6790   0.8819   1.0170   1.1204   1.1337  -(
##
## sigma: 0.180984
## lambda (gene 1): 2.48842
## epsilon (gene 1): 0.212559
## ------------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 26400 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.813
## delta (gene 1): 18.1367
## s (cell 1): 1.37134
## nu (cell 1): 1.0917
## theta (batch 1): 0.00543023
## betas:    1.6270  -0.1151  -0.3654   0.5553   0.6357   0.3421   1.4315   0.3364   1.2975   0.7165  -
##
## sigma: 0.177044
## lambda (gene 1): 0.537333
## epsilon (gene 1): 0.478974
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 26440 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.255
## delta (gene 1): 11.6918
## s (cell 1): 1.1393
## nu (cell 1): 1.21559
## theta (batch 1): 0.00746131
## betas:    1.3493  -0.1104   0.5160   0.4548   0.0275   1.2082   0.8212   0.9744   1.0621   0.8298  -
##
## sigma: 0.177731
## lambda (gene 1): 1.30522
## epsilon (gene 1): 0.014342
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 26480 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.941
## delta (gene 1): 11.3728
## s (cell 1): 1.08648
## nu (cell 1): 1.09843
## theta (batch 1): 0.0198921
```

```
## betas:     1.6325  -0.2491    0.4909  -0.0809  -0.0533    0.9608    0.8135    0.9560    1.3964    0.6956  -(
##
## sigma: 0.179505
## lambda (gene 1): 1.37746
## epsilon (gene 1): 0.0233064
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 26520 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.779
## delta (gene 1): 15.4142
## s (cell 1): 1.02466
## nu (cell 1): 1.01621
## theta (batch 1): 0.0194065
## betas:     1.6712  -0.1335  -0.2360  -0.0193    0.4107    0.7331    1.0166    0.6570    1.2015    0.5667  -(
##
## sigma: 0.171984
## lambda (gene 1): 1.5188
## epsilon (gene 1): 0.300461
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 26560 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.753
## delta (gene 1): 16.3665
## s (cell 1): 1.16119
## nu (cell 1): 1.1224
## theta (batch 1): 0.0175115
## betas:     1.4451  -0.1943  -0.7216    0.5669    0.6006    0.9131    0.5607    1.3639    1.0395    0.7801  -(
##
## sigma: 0.191709
## lambda (gene 1): 0.909506
## epsilon (gene 1): 0.355164
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 26600 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.569
## delta (gene 1): 11.6819
## s (cell 1): 1.41964
## nu (cell 1): 1.07848
## theta (batch 1): 0.0315388
## betas:    1.3167  -0.2352   0.4709   0.2679   0.1842   0.7239   1.3851   0.6285   1.6611   0.7964  -(
##
## sigma: 0.188203
## lambda (gene 1): 0.581152
## epsilon (gene 1): 0.026969
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 26640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 229.604
## delta (gene 1): 16.3124
## s (cell 1): 0.939284
## nu (cell 1): 1.12745
## theta (batch 1): 0.0245419
## betas:    1.3291  -0.2933  -0.0188  -0.1151   0.4643   0.9984   0.7444   1.2948   1.5154   0.6827   (
##
## sigma: 0.180209
## lambda (gene 1): 1.20934
## epsilon (gene 1): 0.377024
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 26680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.318
## delta (gene 1): 22.2999
## s (cell 1): 1.23634
## nu (cell 1): 1.04781
## theta (batch 1): 0.0178619
## betas:    0.5337  -0.1647   0.9835   0.3238   0.3967   1.4105   1.3037   0.9640   1.8146   0.8179  -(
##
## sigma: 0.180127
## lambda (gene 1): 0.417245
## epsilon (gene 1): 0.669955
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.7
## delta (gene 1): 11.5675
## s (cell 1): 1.12955
## nu (cell 1): 1.03145
## theta (batch 1): 0.0180227
## betas:    1.4571  -0.1807   0.6932   0.4588   0.0782   0.7912   1.1359   0.7834   1.4087   0.6178  -(
##
## sigma: 0.176358
## lambda (gene 1): 0.711423
## epsilon (gene 1): 0.0438488
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.104
## delta (gene 1): 10.4147
## s (cell 1): 1.12196
## nu (cell 1): 1.10061
## theta (batch 1): 0.0258042
## betas:    1.5583  -0.2831   0.0585  -0.3991   0.6108   0.6246   1.0445   0.7715   1.7250   0.6692  -(
##
## sigma: 0.184072
## lambda (gene 1): 0.908069
## epsilon (gene 1): -0.0777781
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.153
## delta (gene 1): 10.8669
## s (cell 1): 0.703924
## nu (cell 1): 1.08443
## theta (batch 1): 0.046553
## betas:    1.4325  -0.1908   0.1352   0.2937   0.4213   1.1940   0.5767   1.2639   1.0257   0.9294  -(
##
```

```
## sigma: 0.175788
## lambda (gene 1): 0.187639
## epsilon (gene 1): -0.0495605
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 218.975
## delta (gene 1): 11.8667
## s (cell 1): 1.4328
## nu (cell 1): 1.13074
## theta (batch 1): 0.0425817
## betas:    1.5025  -0.2817   0.0015  -0.6605   0.3971   1.2196   0.4623   1.2900   1.4013   0.7941
##
## sigma: 0.176649
## lambda (gene 1): 1.36929
## epsilon (gene 1): 0.0298887
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.32
## delta (gene 1): 12.1154
## s (cell 1): 0.939259
## nu (cell 1): 1.10575
## theta (batch 1): 0.119483
## betas:    1.4491  -0.2554  -0.1911   0.5561   0.0686   0.7554   1.2043   0.7692   1.5527   0.8216  -0
##
## sigma: 0.18445
## lambda (gene 1): 1.87759
## epsilon (gene 1): 0.0633174
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.168
```

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## delta (gene 1): 15.3847
## s (cell 1): 1.44199
## nu (cell 1): 1.07934
## theta (batch 1): 0.0807527
## betas:    1.3137  -0.2033   0.5801  -0.1362   0.5594   0.9084   0.8744   1.1105   1.2428   0.9958  -(
##
## sigma: 0.171832
## lambda (gene 1): 1.7807
## epsilon (gene 1): 0.294181
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 26960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.624
## delta (gene 1): 15.0642
## s (cell 1): 1.11764
## nu (cell 1): 1.03911
## theta (batch 1): 0.0612887
## betas:    1.4350  -0.2607  -0.0880  -0.6037   0.5872   1.2258   0.4554   1.3549   1.3112   0.7213   (
##
## sigma: 0.180927
## lambda (gene 1): 1.31356
## epsilon (gene 1): 0.274141
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 27000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 266.793
## delta (gene 1): 13.9863
## s (cell 1): 1.03406
## nu (cell 1): 1.05335
## theta (batch 1): 0.0115958
## betas:    1.6118  -0.3177   0.1236  -0.4821   0.6022   0.7275   0.9898   0.8548   1.6784   0.7393  -(
##
## sigma: 0.178
## lambda (gene 1): 3.25068
## epsilon (gene 1): 0.228509
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 126.092
## delta (gene 1): 19.4668
## s (cell 1): 1.00136
## nu (cell 1): 1.05368
## theta (batch 1): 0.0491443
## betas:    1.2814  -0.1451   0.6146  -0.4827   0.7114   1.0389   0.9377   0.8055   1.4882   0.6150  -(
##
## sigma: 0.183829
## lambda (gene 1): 0.401578
## epsilon (gene 1): 0.535282
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.723
## delta (gene 1): 14.8704
## s (cell 1): 1.01777
## nu (cell 1): 1.02651
## theta (batch 1): 0.0258429
## betas:    1.4904  -0.1262   0.4590   0.4180   0.6686   0.6696   0.8914   0.8941   1.1204   0.7278  -(
##
## sigma: 0.186336
## lambda (gene 1): 1.16462
## epsilon (gene 1): 0.26546
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 149.998
## delta (gene 1): 13.8056
## s (cell 1): 0.894278
## nu (cell 1): 0.974553
## theta (batch 1): 0.0201907
## betas:    1.4372  -0.0955   0.3840   0.1688   0.2772   1.2906   0.6362   0.9617   1.1086   0.5977  -(
##
## sigma: 0.16991
## lambda (gene 1): 1.07771
```

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## epsilon (gene 1): 0.192552
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 145.458
## delta (gene 1): 12.0575
## s (cell 1): 1.11042
## nu (cell 1): 0.952101
## theta (batch 1): 0.0150645
## betas:    1.3012  -0.1809   0.1438   0.2104   0.7506   0.6473   1.0101   1.0647   1.1910   0.9967  -(
##
## sigma: 0.174056
## lambda (gene 1): 0.965348
## epsilon (gene 1): 0.0415849
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 426.67
## delta (gene 1): 10.8436
## s (cell 1): 1.14024
## nu (cell 1): 1.00336
## theta (batch 1): 0.0340054
## betas:    1.6718  -0.2244   0.5911  -0.3122   0.2665   0.7356   0.9631   0.9215   1.1055   1.0012  -(
##
## sigma: 0.170555
## lambda (gene 1): 1.19949
## epsilon (gene 1): -0.0601386
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.064
## delta (gene 1): 13.8879
## s (cell 1): 1.12461
```

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## nu (cell 1): 1.08054
## theta (batch 1): 0.00188941
## betas:    1.4205  -0.1384   0.6738  -0.0029   0.5107   0.6489   1.1563   0.6180   1.5654   0.3441  -(
##
## sigma: 0.175103
## lambda (gene 1): 2.86389
## epsilon (gene 1): 0.220799
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 27280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.373
## delta (gene 1): 17.5016
## s (cell 1): 1.01891
## nu (cell 1): 0.98472
## theta (batch 1): 0.00199466
## betas:    1.0960  -0.1655  -0.0624  -0.3600   0.8768   1.1622   0.7819   1.2074   1.3076   0.7460  -(
##
## sigma: 0.181719
## lambda (gene 1): 1.45155
## epsilon (gene 1): 0.436498
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 27320 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.305
## delta (gene 1): 10.9393
## s (cell 1): 1.16364
## nu (cell 1): 1.16201
## theta (batch 1): 0.00290848
## betas:    1.7214  -0.1030   0.5010  -0.7576   1.3145   0.5609   0.7307   0.8756   1.0099   0.4765  -(
##
## sigma: 0.186089
## lambda (gene 1): 0.563046
## epsilon (gene 1): -0.0554253
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
```

```
## Iteration 27360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 321.625
## delta (gene 1): 17.4613
## s (cell 1): 1.20914
## nu (cell 1): 1.08173
## theta (batch 1): 0.0117865
## betas:    1.7692  -0.2334  -0.0954  -0.4803   0.3135   1.1370   0.3533   1.1702   1.2174   0.5331  -(
##
## sigma: 0.184774
## lambda (gene 1): 1.4402
## epsilon (gene 1): 0.43459
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 27400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.704
## delta (gene 1): 13.2051
## s (cell 1): 0.905464
## nu (cell 1): 1.06201
## theta (batch 1): 0.00743079
## betas:    1.3010  -0.2223  -0.1061   0.2495   0.2728   1.1441   0.7139   1.2985   1.2045   0.9053  -(
##
## sigma: 0.176422
## lambda (gene 1): 0.331915
## epsilon (gene 1): 0.15894
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 27440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 188.219
## delta (gene 1): 12.5184
## s (cell 1): 1.03484
## nu (cell 1): 1.03914
## theta (batch 1): 0.00381905
## betas:    1.4081  -0.2006  -0.8161   0.7492   0.1538   0.7504   1.2219   0.7210   1.4149   0.8621  -(
##
## sigma: 0.181263
## lambda (gene 1): 1.10313
## epsilon (gene 1): 0.0694246
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 27480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.646
## delta (gene 1): 15.0603
## s (cell 1): 1.02506
## nu (cell 1): 1.1106
## theta (batch 1): 0.00388191
## betas:    1.3484  -0.0279  -0.1226  -0.3085   0.9189   1.1428   0.7688   0.7120   1.2819   0.2414  -(
##
## sigma: 0.18469
## lambda (gene 1): 0.891368
## epsilon (gene 1): 0.267552
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 27520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.024
## delta (gene 1): 12.2524
## s (cell 1): 1.07066
## nu (cell 1): 1.08531
## theta (batch 1): 0.0052146
## betas:    1.0899  -0.1153   0.3045   0.4047   0.7557   0.7237   1.1283   0.9850   1.2200   0.9094  -(
##
## sigma: 0.173492
## lambda (gene 1): 1.39177
## epsilon (gene 1): 0.0645935
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 27560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.967
## delta (gene 1): 17.9481
## s (cell 1): 1.06756
## nu (cell 1): 1.16395
## theta (batch 1): 0.00491861
```

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## betas:    2.0377  -0.1369  -0.3527  -0.1150   0.0251   0.8188   0.8586   0.3510   1.4228   0.1233  -(
##
## sigma: 0.174827
## lambda (gene 1): 0.995644
## epsilon (gene 1): 0.492161
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.691
## delta (gene 1): 13.3851
## s (cell 1): 0.996895
## nu (cell 1): 0.967007
## theta (batch 1): 0.00984678
## betas:    1.1296  -0.0954   0.7156  -0.0821   0.6686   1.1504   0.9769   0.7946   1.5320   0.2848  -(
##
## sigma: 0.175527
## lambda (gene 1): 0.743533
## epsilon (gene 1): 0.153009
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.581
## delta (gene 1): 14.5817
## s (cell 1): 1.11915
## nu (cell 1): 1.02615
## theta (batch 1): 0.0225469
## betas:    1.3706  -0.1732   0.4293  -0.0207   0.6110   1.1030   0.4489   1.3862   1.0165   0.8120  -(
##
## sigma: 0.177488
## lambda (gene 1): 1.28795
## epsilon (gene 1): 0.250422
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 27680 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 133.402
## delta (gene 1): 12.8987
## s (cell 1): 1.10951
## nu (cell 1): 1.07132
## theta (batch 1): 0.0224214
## betas:    2.1236  -0.1242  -0.0621  -0.2192   0.3720   0.5748   0.5798   0.8447   0.7862   0.5285  -(
##
## sigma: 0.173173
## lambda (gene 1): 0.436588
## epsilon (gene 1): 0.133331
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 27720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 273.592
## delta (gene 1): 16.8324
## s (cell 1): 1.17453
## nu (cell 1): 1.1367
## theta (batch 1): 0.0118785
## betas:    1.6580  -0.1113  -0.4391   0.5335   0.2902   0.9366   0.7643   0.7548   1.1872   0.4663  -(
##
## sigma: 0.180706
## lambda (gene 1): 0.630812
## epsilon (gene 1): 0.385961
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 27760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.722
## delta (gene 1): 15.6652
## s (cell 1): 1.04782
## nu (cell 1): 1.06326
## theta (batch 1): 0.0156305
## betas:    1.7243  -0.3363   0.3326   0.0587   0.4336   0.6555   0.5525   1.4685   1.1298   0.8956   (
##
## sigma: 0.182207
## lambda (gene 1): 0.631694
## epsilon (gene 1): 0.32231
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 27800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.731
## delta (gene 1): 12.6115
## s (cell 1): 0.854014
## nu (cell 1): 1.12795
## theta (batch 1): 0.0182652
## betas:    2.1468  -0.2378   0.0758   0.0666  -0.4007   1.0402   0.3917   0.9849   1.0304   0.5328  -(
##
## sigma: 0.181403
## lambda (gene 1): 0.527868
## epsilon (gene 1): 0.108499
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 27840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 319.667
## delta (gene 1): 13.3735
## s (cell 1): 1.45241
## nu (cell 1): 1.1533
## theta (batch 1): 0.0241764
## betas:    1.7600  -0.2494   0.1195   0.3170  -0.0095   1.0223   0.5425   1.1488   1.1535   0.7708  -(
##
## sigma: 0.176526
## lambda (gene 1): 1.21514
## epsilon (gene 1): 0.171688
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 27880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.203
## delta (gene 1): 11.3629
## s (cell 1): 0.887843
## nu (cell 1): 1.0149
## theta (batch 1): 0.0147769
## betas:    1.6668  -0.1774  -0.0376   0.0409   0.9168   0.5709   0.8227   0.9238   1.1332   0.6696  -(
##
```

```
## sigma: 0.180759
## lambda (gene 1): 0.464946
## epsilon (gene 1): 0.0111939
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 27920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 116.414
## delta (gene 1): 17.2335
## s (cell 1): 1.1835
## nu (cell 1): 1.15092
## theta (batch 1): 0.00256398
## betas:    1.2765  -0.1188   1.5266  -0.5684   0.4717   1.2947   0.5792   1.1958   1.0836   0.7836  -(
##
## sigma: 0.196945
## lambda (gene 1): 0.868535
## epsilon (gene 1): 0.419537
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 27960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 286.366
## delta (gene 1): 11.3387
## s (cell 1): 1.15357
## nu (cell 1): 1.12091
## theta (batch 1): 0.00713425
## betas:    1.9768  -0.2797  -0.3380  -0.0628   0.1719   0.5878   0.9781   0.6860   1.2967   0.9170  -(
##
## sigma: 0.188184
## lambda (gene 1): 2.27308
## epsilon (gene 1): -0.00245082
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 28000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.501
```

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## delta (gene 1): 13.3951
## s (cell 1): 1.06401
## nu (cell 1): 1.05321
## theta (batch 1): 0.00419721
## betas:    1.5190  -0.1315   0.3712  -0.3287   0.5399   0.8736   0.7836   1.0615   0.9184   0.9222  -(
##
## sigma: 0.184721
## lambda (gene 1): 0.840368
## epsilon (gene 1): 0.186823
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 28040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.726
## delta (gene 1): 11.1846
## s (cell 1): 1.06387
## nu (cell 1): 1.05402
## theta (batch 1): 0.00809394
## betas:    1.5739  -0.1733  -0.4981  -0.0208   0.9268   0.6834   0.8521   0.8164   1.4149   0.5076  -(
##
## sigma: 0.179322
## lambda (gene 1): 1.25686
## epsilon (gene 1): -0.0128049
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 28080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.448
## delta (gene 1): 11.5627
## s (cell 1): 1.16465
## nu (cell 1): 1.13939
## theta (batch 1): 0.0050715
## betas:    1.3059  -0.1476   0.2351  -0.4161   0.7046   1.0570   0.9564   0.7212   1.4955   0.6762  -(
##
## sigma: 0.184045
## lambda (gene 1): 2.04812
## epsilon (gene 1): 0.00096153
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 28120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 242.14
## delta (gene 1): 12.848
## s (cell 1): 1.1426
## nu (cell 1): 1.05267
## theta (batch 1): 0.0323139
## betas:    0.9737  -0.1950   0.3803  -0.3056   1.3353   0.4106   1.4947   0.7755   1.7770   0.7279  -(
##
## sigma: 0.176858
## lambda (gene 1): 0.51824
## epsilon (gene 1): 0.132226
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 28160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 175.19
## delta (gene 1): 13.7909
## s (cell 1): 0.909951
## nu (cell 1): 0.955787
## theta (batch 1): 0.0185001
## betas:    1.6333  -0.2194  -0.0725  -0.1296   0.3330   0.7212   0.9976   0.8371   1.3015   0.7074  -(
##
## sigma: 0.184799
## lambda (gene 1): 1.26559
## epsilon (gene 1): 0.182391
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 28200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 332.884
## delta (gene 1): 11.2208
## s (cell 1): 1.51402
## nu (cell 1): 1.1365
## theta (batch 1): 0.0376321
## betas:    0.6343  -0.1986  -0.4994  -0.0195   1.2038   1.2172   0.8540   1.5748   1.3410   0.9910   (
##
## sigma: 0.179419
## lambda (gene 1): 2.10548
```

```
## epsilon (gene 1): -0.00552125
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 28240 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.22
## delta (gene 1): 13.4122
## s (cell 1): 0.814461
## nu (cell 1): 1.04735
## theta (batch 1): 0.0337629
## betas:    1.6095  -0.2524  -0.1071  -0.5057   0.3422   1.2629   0.3782   1.2122   1.3553   0.6378  -(
##
## sigma: 0.189587
## lambda (gene 1): 0.558792
## epsilon (gene 1): 0.179091
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 28280 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 410.365
## delta (gene 1): 17.5481
## s (cell 1): 1.04977
## nu (cell 1): 1.05191
## theta (batch 1): 0.0205289
## betas:    0.9022  -0.1288  -0.2638   0.3168   0.4729   1.4232   1.1307   0.7232   1.8065   0.3949   (
##
## sigma: 0.185008
## lambda (gene 1): 0.707419
## epsilon (gene 1): 0.430008
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 28320 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.702
## delta (gene 1): 16.1505
## s (cell 1): 1.05418
```

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## nu (cell 1): 1.07688
## theta (batch 1): 0.0177501
## betas:    1.2148  -0.1827  -0.4576  -0.3992   0.5497   1.2270   0.6897   1.3070   1.0881   1.0801  -(
##
## sigma: 0.171057
## lambda (gene 1): 0.343334
## epsilon (gene 1): 0.359422
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 28360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 217.891
## delta (gene 1): 11.42
## s (cell 1): 0.991664
## nu (cell 1): 0.979808
## theta (batch 1): 0.00958077
## betas:    0.8331  -0.1365  -0.2476  -0.2340   0.9268   1.1480   1.0237   1.0990   1.4743   0.6815   (
##
## sigma: 0.190982
## lambda (gene 1): 0.896758
## epsilon (gene 1): -0.00933048
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 28400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.038
## delta (gene 1): 15.7341
## s (cell 1): 1.0248
## nu (cell 1): 1.09371
## theta (batch 1): 0.00620563
## betas:    1.2473  -0.1463   0.0932   0.2719   0.6013   1.1276   0.8390   0.9637   1.3953   0.6249  -(
##
## sigma: 0.177096
## lambda (gene 1): 0.394567
## epsilon (gene 1): 0.350339
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
```

```
## Iteration 28440 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 131.466
## delta (gene 1): 14.3639
## s (cell 1): 0.90059
## nu (cell 1): 1.0546
## theta (batch 1): 0.0104229
## betas:    2.0533  -0.2236  -0.2620  -0.0687  -0.0461   0.9653   0.4097   1.0420   0.9193   0.8563  -(
##
## sigma: 0.189449
## lambda (gene 1): 1.60662
## epsilon (gene 1): 0.228213
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 28480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.443
## delta (gene 1): 12.7246
## s (cell 1): 1.21174
## nu (cell 1): 1.10746
## theta (batch 1): 0.0220317
## betas:    1.3151  -0.1615   0.4169   0.0018   0.2026   1.2339   0.9485   0.8830   1.3376   0.7543  -(
##
## sigma: 0.171178
## lambda (gene 1): 2.21981
## epsilon (gene 1): 0.0994804
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 28520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.244
## delta (gene 1): 12.6035
## s (cell 1): 1.00844
## nu (cell 1): 1.08224
## theta (batch 1): 0.023545
## betas:    0.7437  -0.0898   0.2593   0.6627   0.6664   1.0464   1.4429   0.6197   1.8208   0.4694  -(
##
## sigma: 0.181553
## lambda (gene 1): 0.664426
## epsilon (gene 1): 0.112422
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 28560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 120.793
## delta (gene 1): 22.0944
## s (cell 1): 1.00247
## nu (cell 1): 1.05016
## theta (batch 1): 0.0305231
## betas:    1.1380   -0.1774   -0.0446    0.4225    0.8675    0.3917    1.3346    1.0471    1.1345    1.1440   -(
##
## sigma: 0.179635
## lambda (gene 1): 0.859477
## epsilon (gene 1): 0.659579
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 28600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.639
## delta (gene 1): 14.8391
## s (cell 1): 1.00025
## nu (cell 1): 1.03519
## theta (batch 1): 0.0670003
## betas:    1.8131   -0.1434    0.0213   -0.5153    0.2584    0.7912    0.9194    0.6152    1.2015    0.5808   -(
##
## sigma: 0.180691
## lambda (gene 1): 1.0477
## epsilon (gene 1): 0.279618
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 28640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.021
## delta (gene 1): 12.7942
## s (cell 1): 2.52158
## nu (cell 1): 1.05925
## theta (batch 1): 0.0830684
```

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## betas:     1.4517  -0.1576   0.6180   0.0086   0.4901   1.4149   0.0662   1.6106   0.8267   0.7460  -0
##
## sigma: 0.183455
## lambda (gene 1): 1.25162
## epsilon (gene 1): 0.119379
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 28680 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.909
## delta (gene 1): 14.7869
## s (cell 1): 0.894342
## nu (cell 1): 1.15997
## theta (batch 1): 0.0259088
## betas:     1.4373  -0.2364   0.5231  -0.4113   0.8588   0.8219   0.6834   1.2299   1.3458   0.7269  -0
##
## sigma: 0.186209
## lambda (gene 1): 1.59674
## epsilon (gene 1): 0.284239
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 28720 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.721
## delta (gene 1): 15.9993
## s (cell 1): 1.00699
## nu (cell 1): 1.05038
## theta (batch 1): 0.0133463
## betas:     1.2781  -0.2863  -0.1700   0.2628   0.1011   1.0293   0.9492   1.3178   1.0540   1.5872  -0
##
## sigma: 0.178456
## lambda (gene 1): 1.86951
## epsilon (gene 1): 0.313237
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 28760 out of 40000 has been completed.
## ------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 317.691
## delta (gene 1): 17.8403
## s (cell 1): 1.02697
## nu (cell 1): 1.03821
## theta (batch 1): 0.015439
## betas:    1.7833  -0.2094   0.0346  -0.6308   0.5465   0.8633   0.6562   1.0235   1.1281   0.5376  -(
##
## sigma: 0.175811
## lambda (gene 1): 0.65108
## epsilon (gene 1): 0.485121
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 28800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.876
## delta (gene 1): 12.9156
## s (cell 1): 0.817321
## nu (cell 1): 1.05105
## theta (batch 1): 0.0672904
## betas:    1.3164  -0.1731   0.1517  -0.0618   1.0123   0.7611   0.7582   1.1599   1.2840   0.6216  -(
##
## sigma: 0.177888
## lambda (gene 1): 1.34152
## epsilon (gene 1): 0.139171
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 28840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 305.611
## delta (gene 1): 14.7495
## s (cell 1): 0.776255
## nu (cell 1): 1.14742
## theta (batch 1): 0.0430402
## betas:    1.4334  -0.1439  -0.3384   0.3371   0.5560   1.2378   0.5986   1.1234   1.0268   0.8494  -(
##
## sigma: 0.183953
## lambda (gene 1): 0.610134
## epsilon (gene 1): 0.238267
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 28880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.492
## delta (gene 1): 13.2566
## s (cell 1): 0.801063
## nu (cell 1): 0.944998
## theta (batch 1): 0.0265324
## betas:     1.2203   -0.0404    0.5137    0.5693    0.4736    0.7281    1.3718    0.4816    1.3209    0.5674   -
##
## sigma: 0.178243
## lambda (gene 1): 1.14248
## epsilon (gene 1): 0.144251
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 28920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.855
## delta (gene 1): 12.1424
## s (cell 1): 1.2631
## nu (cell 1): 1.1031
## theta (batch 1): 0.0294356
## betas:     0.9659   -0.2033    0.5414    0.0662    0.5787    0.9982    1.2289    0.8771    1.7772    0.6913   -
##
## sigma: 0.184957
## lambda (gene 1): 1.01735
## epsilon (gene 1): 0.0665937
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 28960 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.453
## delta (gene 1): 14.6157
## s (cell 1): 1.09646
## nu (cell 1): 1.04124
## theta (batch 1): 0.0256249
## betas:     1.2500   -0.1442   -0.1755    0.5938    0.6835    0.5994    1.3053    0.6649    1.5389    0.4865   -
##
```

```
## sigma: 0.192384
## lambda (gene 1): 0.534896
## epsilon (gene 1): 0.245557
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 29000 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 135.642
## delta (gene 1): 15.5279
## s (cell 1): 1.12422
## nu (cell 1): 1.10109
## theta (batch 1): 0.0236699
## betas:    1.0405  -0.0473  -0.1478   0.4630   1.3247   0.2518   1.4291   0.9299   1.0458   0.6369  -(
##
## sigma: 0.171592
## lambda (gene 1): 0.965583
## epsilon (gene 1): 0.30655
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 29040 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 288.089
## delta (gene 1): 13.1445
## s (cell 1): 1.15253
## nu (cell 1): 1.01164
## theta (batch 1): 0.0512225
## betas:    1.7331  -0.1777  -0.9100  -0.4041   0.8488   0.3984   1.2555   0.4403   1.4877   0.4633  -(
##
## sigma: 0.176133
## lambda (gene 1): 1.01662
## epsilon (gene 1): 0.122177
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 29080 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 136.027
```

```
## delta (gene 1): 12.6564
## s (cell 1): 1.09539
## nu (cell 1): 1.07711
## theta (batch 1): 0.0362566
## betas:     0.8097  -0.0944   0.3958  -0.3982   1.0208   1.3435   0.8722   1.0999   1.3759   0.8954  -(
##
## sigma: 0.172506
## lambda (gene 1): 0.959041
## epsilon (gene 1): 0.104443
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 29120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.211
## delta (gene 1): 14.8957
## s (cell 1): 1.23573
## nu (cell 1): 1.07786
## theta (batch 1): 0.029279
## betas:     1.3686  -0.1553  -0.2497   0.1805   0.2069   1.4697   0.3556   1.2969   1.1251   0.7149  -(
##
## sigma: 0.179363
## lambda (gene 1): 0.938894
## epsilon (gene 1): 0.276476
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 29160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 150.786
## delta (gene 1): 17.7388
## s (cell 1): 0.839835
## nu (cell 1): 1.03531
## theta (batch 1): 0.0513048
## betas:     1.7784  -0.1768  -0.6617  -0.1220   0.3665   0.7019   0.8757   0.9207   0.8048   1.1842  -:
##
## sigma: 0.190945
## lambda (gene 1): 1.00009
## epsilon (gene 1): 0.398932
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 29200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.915
## delta (gene 1): 14.2804
## s (cell 1): 0.941067
## nu (cell 1): 1.01546
## theta (batch 1): 0.0408567
## betas:   1.6398  -0.1664   0.1488  -0.2333   0.6229   0.5493   1.0402   0.7230   1.2764   0.5808  -(
##
## sigma: 0.177153
## lambda (gene 1): 0.511398
## epsilon (gene 1): 0.226729
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 29240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.912
## delta (gene 1): 11.7073
## s (cell 1): 0.864106
## nu (cell 1): 1.02426
## theta (batch 1): 0.0526242
## betas:   1.6975  -0.1429   0.2138   0.5055   0.0785   1.0627   0.6106   0.8846   1.0486   0.8564  -
##
## sigma: 0.176651
## lambda (gene 1): 1.09118
## epsilon (gene 1): 0.0239717
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 29280 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.161
## delta (gene 1): 10.8446
## s (cell 1): 1.47938
## nu (cell 1): 1.04538
## theta (batch 1): 0.0569502
## betas:   1.5743  -0.2473  -0.3271  -0.2086   0.9463   0.4634   1.0279   0.9716   1.2352   1.0012  -(
##
## sigma: 0.184461
## lambda (gene 1): 1.31466
```

```
## epsilon (gene 1): -0.0405243
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 29320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.368
## delta (gene 1): 13.8269
## s (cell 1): 0.945002
## nu (cell 1): 1.10877
## theta (batch 1): 0.0423894
## betas:    1.5546  -0.2281   0.1346   0.2076   0.0921   1.0915   0.7848   1.0124   1.3298   0.7322  -0
##
## sigma: 0.184613
## lambda (gene 1): 1.20792
## epsilon (gene 1): 0.207185
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 29360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.694
## delta (gene 1): 15.0859
## s (cell 1): 0.994388
## nu (cell 1): 1.08384
## theta (batch 1): 0.0624751
## betas:    1.7530  -0.2192  -0.3497   0.6944   0.0796   0.8577   0.9784   0.7252   1.2416   0.9215  -0
##
## sigma: 0.179735
## lambda (gene 1): 0.530551
## epsilon (gene 1): 0.269847
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 29400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.449
## delta (gene 1): 17.7475
## s (cell 1): 0.806272
```

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## nu (cell 1): 1.0597
## theta (batch 1): 0.0416584
## betas:    0.7083  -0.0984    0.9092    0.6583    0.6269    0.9197    1.5044    0.5805    1.8784    0.6053  -(
##
## sigma: 0.181774
## lambda (gene 1): 0.897188
## epsilon (gene 1): 0.440951
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 29440 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.441
## delta (gene 1): 16.0877
## s (cell 1): 0.922797
## nu (cell 1): 0.988292
## theta (batch 1): 0.0128399
## betas:    1.4719  -0.1652  -0.5348    0.3772    0.0468    1.0432    0.8108    0.8800    1.3813    0.5678  -(
##
## sigma: 0.182643
## lambda (gene 1): 0.738459
## epsilon (gene 1): 0.366704
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 29480 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.743
## delta (gene 1): 12.8748
## s (cell 1): 1.05515
## nu (cell 1): 0.990316
## theta (batch 1): 0.0131205
## betas:    1.1640  -0.1777    0.2774    0.0537    0.0762    1.5490    0.6592    1.0484    1.6125    0.5667  -(
##
## sigma: 0.180412
## lambda (gene 1): 0.95875
## epsilon (gene 1): 0.152559
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
```

```
## Iteration 29520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 98.8478
## delta (gene 1): 20.7371
## s (cell 1): 1.0945
## nu (cell 1): 1.03851
## theta (batch 1): 0.010463
## betas:    1.5494  -0.1498  -0.4692  -0.2732   0.6572   0.9902   0.6169   1.0663   0.9913   0.9545  -(
##
## sigma: 0.179574
## lambda (gene 1): 0.548478
## epsilon (gene 1): 0.590235
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 29560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 284.018
## delta (gene 1): 17.8768
## s (cell 1): 1.0253
## nu (cell 1): 1.0784
## theta (batch 1): 0.0131638
## betas:    1.3114  -0.1550  -0.2282   0.3050   0.3879   1.2130   0.5709   1.2082   1.2218   0.6611  -(
##
## sigma: 0.180689
## lambda (gene 1): 0.48342
## epsilon (gene 1): 0.463375
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 29600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.056
## delta (gene 1): 16.7513
## s (cell 1): 0.899437
## nu (cell 1): 1.0483
## theta (batch 1): 0.0126137
## betas:    1.2373  -0.2919  -0.5521   0.8120  -0.2820   1.1740   1.0294   1.1038   1.4398   1.1997  -(
##
## sigma: 0.185422
## lambda (gene 1): 0.256307
## epsilon (gene 1): 0.377232
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 29640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.153
## delta (gene 1): 15.5556
## s (cell 1): 1.06382
## nu (cell 1): 1.15626
## theta (batch 1): 0.00368363
## betas:    1.7931  -0.2181  -0.5752   0.3830   0.3721   0.6208   1.0017   0.7502   1.2178   0.8343  -(
##
## sigma: 0.184484
## lambda (gene 1): 1.84419
## epsilon (gene 1): 0.319134
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 29680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.704
## delta (gene 1): 13.4357
## s (cell 1): 1.12231
## nu (cell 1): 1.06551
## theta (batch 1): 0.00230179
## betas:    1.5189  -0.1264  -0.1882   0.6539   0.3483   0.8451   0.8742   0.8634   1.1088   0.7910  -(
##
## sigma: 0.186628
## lambda (gene 1): 1.55508
## epsilon (gene 1): 0.159318
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 29720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 213.44
## delta (gene 1): 11.2055
## s (cell 1): 0.819235
## nu (cell 1): 1.11214
## theta (batch 1): 0.0141514
```

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## betas:    0.9193  -0.1456   0.5987   0.4381   0.9682   1.2212   0.9331   0.9966   1.5617   0.7160  -0
##
## sigma: 0.178748
## lambda (gene 1): 0.709501
## epsilon (gene 1): -0.0259601
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 29760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 315.727
## delta (gene 1): 14.059
## s (cell 1): 1.06394
## nu (cell 1): 1.05693
## theta (batch 1): 0.00888245
## betas:    1.5656  -0.2130   0.5070  -0.6499   0.5411   0.7780   0.9636   0.9796   1.0765   1.0643  -0
##
## sigma: 0.178142
## lambda (gene 1): 0.623109
## epsilon (gene 1): 0.200638
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 29800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 246.667
## delta (gene 1): 13.8886
## s (cell 1): 0.997573
## nu (cell 1): 1.06521
## theta (batch 1): 0.01432
## betas:    1.8456  -0.2721   0.3469  -0.0502   0.2417   0.6601   1.0376   0.5535   1.6885   0.4797  -0
##
## sigma: 0.180842
## lambda (gene 1): 1.39831
## epsilon (gene 1): 0.21342
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 29840 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.832
## delta (gene 1): 16.3924
## s (cell 1): 0.984533
## nu (cell 1): 1.06871
## theta (batch 1): 0.0722028
## betas:    1.7945  -0.2071  -0.1086   0.1239   0.1873   0.9465   0.6836   0.7819   1.4518   0.2973  -(
##
## sigma: 0.174246
## lambda (gene 1): 0.83503
## epsilon (gene 1): 0.367864
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 29880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 110.94
## delta (gene 1): 14.5381
## s (cell 1): 1.0692
## nu (cell 1): 1.07975
## theta (batch 1): 0.0575729
## betas:    1.3803  -0.1647   0.3238   0.5251   0.2825   0.9562   0.8417   1.0196   1.2723   0.6006  -(
##
## sigma: 0.171871
## lambda (gene 1): 2.15665
## epsilon (gene 1): 0.252682
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 29920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.701
## delta (gene 1): 15.5416
## s (cell 1): 1.47676
## nu (cell 1): 1.08601
## theta (batch 1): 0.0223987
## betas:    1.1488  -0.1793  -0.0178   0.2546   0.4756   1.0268   0.7568   1.3777   1.0969   0.9011  -(
##
## sigma: 0.177048
## lambda (gene 1): 1.77572
## epsilon (gene 1): 0.305778
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 29960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 330.142
## delta (gene 1): 16.7316
## s (cell 1): 0.801413
## nu (cell 1): 0.987121
## theta (batch 1): 0.017188
## betas:    1.7603  -0.2159  -0.1823  -1.0140   0.7308   1.0768   0.3691   1.0819   1.2126   0.6388  -(
##
## sigma: 0.185161
## lambda (gene 1): 0.479036
## epsilon (gene 1): 0.401143
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 194.462
## delta (gene 1): 12.2552
## s (cell 1): 1.0687
## nu (cell 1): 1.10606
## theta (batch 1): 0.0114342
## betas:    1.3941  -0.1285  -0.2305   0.2638   0.3849   0.9267   0.9703   0.8507   1.2925   0.5956  -(
##
## sigma: 0.182733
## lambda (gene 1): 1.59141
## epsilon (gene 1): 0.0893813
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.221
## delta (gene 1): 13.8172
## s (cell 1): 1.11614
## nu (cell 1): 1.07293
## theta (batch 1): 0.00775031
## betas:    1.8151  -0.1416   0.1456  -0.3496   0.1504   1.2439   0.4784   0.8368   1.0914   0.6607  -(
##
```

```
## sigma: 0.182347
## lambda (gene 1): 2.73116
## epsilon (gene 1): 0.183178
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 30080 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.954
## delta (gene 1): 16.0597
## s (cell 1): 1.25854
## nu (cell 1): 1.13147
## theta (batch 1): 0.0136317
## betas:     1.5902  -0.1178  -0.1716   0.5493   0.2268   1.0195   0.9134   0.6324   1.3819   0.2065  -0
##
## sigma: 0.19254
## lambda (gene 1): 1.10327
## epsilon (gene 1): 0.351528
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 30120 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.969
## delta (gene 1): 14.0519
## s (cell 1): 1.46681
## nu (cell 1): 1.08375
## theta (batch 1): 0.0209697
## betas:     1.2767  -0.0500  -0.4128   0.1578   1.1354   0.7210   1.0287   0.8156   1.0186   0.7524  -0
##
## sigma: 0.185023
## lambda (gene 1): 1.67741
## epsilon (gene 1): 0.181198
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 30160 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 360.733
```

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## delta (gene 1): 15.8686
## s (cell 1): 1.32893
## nu (cell 1): 1.17243
## theta (batch 1): 0.0151831
## betas:    1.2110  -0.2154   0.1386  -0.4691   0.4152   1.1722   1.0557   0.8806   1.6019   0.7882  -(
##
## sigma: 0.173278
## lambda (gene 1): 0.924999
## epsilon (gene 1): 0.335042
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 30200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.435
## delta (gene 1): 14.2567
## s (cell 1): 0.839566
## nu (cell 1): 1.05757
## theta (batch 1): 0.0332811
## betas:    1.0076  -0.1217  -0.1865   0.0463   0.8806   1.1640   0.9599   1.0313   1.3840   0.6575  -(
##
## sigma: 0.177197
## lambda (gene 1): 0.577101
## epsilon (gene 1): 0.225722
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 30240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 273.744
## delta (gene 1): 16.072
## s (cell 1): 1.11097
## nu (cell 1): 1.06613
## theta (batch 1): 0.0168179
## betas:    1.5993  -0.1047  -0.7288   0.7653   0.2128   0.5775   1.1372   0.6377   1.2206   0.4538  -(
##
## sigma: 0.171721
## lambda (gene 1): 0.336998
## epsilon (gene 1): 0.338051
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.269
## delta (gene 1): 12.0191
## s (cell 1): 1.10493
## nu (cell 1): 1.1326
## theta (batch 1): 0.01176
## betas:    1.4607  -0.1154   0.0553   0.6632   0.1082   1.1087   0.7477   0.8936   1.2347   0.4783  -(
##
## sigma: 0.179648
## lambda (gene 1): 2.84406
## epsilon (gene 1): 0.0641814
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.188
## delta (gene 1): 13.201
## s (cell 1): 1.35529
## nu (cell 1): 1.09399
## theta (batch 1): 0.0152088
## betas:    1.9094  -0.2461  -0.0464   0.2151   0.1143   0.5801   0.9466   0.7770   1.1875   0.9649  -(
##
## sigma: 0.178966
## lambda (gene 1): 0.70266
## epsilon (gene 1): 0.150404
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 323.676
## delta (gene 1): 14.3632
## s (cell 1): 1.07867
## nu (cell 1): 1.02907
## theta (batch 1): 0.0712318
## betas:    1.4956  -0.1994  -0.1453   0.1136   0.5429   0.9588   0.6837   0.9761   1.5070   0.4745  -(
##
## sigma: 0.185925
## lambda (gene 1): 0.746516
```

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## epsilon (gene 1): 0.253367
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 179.556
## delta (gene 1): 16.191
## s (cell 1): 0.995334
## nu (cell 1): 1.12991
## theta (batch 1): 0.0379724
## betas:    1.2020  -0.1028   0.6072   0.1688   0.6333   1.2317   0.5814   1.2443   0.9811   0.9222  -0
##
## sigma: 0.180899
## lambda (gene 1): 0.78657
## epsilon (gene 1): 0.334732
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.955
## delta (gene 1): 16.4219
## s (cell 1): 1.23686
## nu (cell 1): 1.17443
## theta (batch 1): 0.0371391
## betas:    1.7909  -0.2052   0.7710  -1.0514   0.3581   1.0171   0.5480   0.9988   1.1502   0.6890  -0
##
## sigma: 0.179146
## lambda (gene 1): 0.828607
## epsilon (gene 1): 0.366996
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.319
## delta (gene 1): 17.4403
## s (cell 1): 0.980886
```

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## nu (cell 1): 1.01934
## theta (batch 1): 0.0871587
## betas:    1.8435  -0.1362   0.4236  -0.4133   0.3473   1.0888   0.3495   1.0073   1.0234   0.4636   -(
##
## sigma: 0.1847
## lambda (gene 1): 0.977596
## epsilon (gene 1): 0.422725
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 30520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.729
## delta (gene 1): 11.3261
## s (cell 1): 1.05582
## nu (cell 1): 1.04982
## theta (batch 1): 0.050542
## betas:    1.6327  -0.2115   0.0771  -0.5049   0.5423   1.1734   0.6385   0.8169   1.5902   0.3770   -(
##
## sigma: 0.18006
## lambda (gene 1): 0.477553
## epsilon (gene 1): 0.0121857
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 30560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 296.187
## delta (gene 1): 16.2708
## s (cell 1): 1.11923
## nu (cell 1): 1.11241
## theta (batch 1): 0.0506243
## betas:    1.6106  -0.2222   0.1786  -0.3123   0.6857   0.9752   0.4346   1.5246   0.7079   1.1727   -(
##
## sigma: 0.183586
## lambda (gene 1): 0.555285
## epsilon (gene 1): 0.357391
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
```

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## Iteration 30600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 125.754
## delta (gene 1): 15.0692
## s (cell 1): 1.5092
## nu (cell 1): 1.06722
## theta (batch 1): 0.0143245
## betas:    1.4443  -0.2402  -0.7038   0.4258   0.4256   0.5697   1.3387   0.6772   1.5922   0.7607  -(
##
## sigma: 0.171843
## lambda (gene 1): 0.414385
## epsilon (gene 1): 0.283922
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 208.312
## delta (gene 1): 12.6945
## s (cell 1): 1.13836
## nu (cell 1): 1.06939
## theta (batch 1): 0.0280121
## betas:    1.2025  -0.1200   0.5923  -0.0553   0.3762   1.2420   0.7003   1.1585   1.0020   1.0244  -(
##
## sigma: 0.17669
## lambda (gene 1): 1.83222
## epsilon (gene 1): 0.119977
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 30680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 297.089
## delta (gene 1): 13.9956
## s (cell 1): 1.25248
## nu (cell 1): 1.03353
## theta (batch 1): 0.039304
## betas:    1.7397  -0.3175  -0.4478  -0.1676   1.0166   0.3485   0.8336   1.3017   0.8770   1.5782  -(
##
## sigma: 0.189917
## lambda (gene 1): 2.11858
## epsilon (gene 1): 0.184494
## ---------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 30720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.487
## delta (gene 1): 9.8793
## s (cell 1): 1.33889
## nu (cell 1): 1.05481
## theta (batch 1): 0.0191039
## betas:    1.3308  -0.2656  -0.4001   0.7137  -0.2380   1.2762   0.7434   1.1764   1.5039   0.8050  -(
##
## sigma: 0.189658
## lambda (gene 1): 1.78465
## epsilon (gene 1): -0.133351
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 30760 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.046
## delta (gene 1): 14.9717
## s (cell 1): 0.91962
## nu (cell 1): 1.10487
## theta (batch 1): 0.0128829
## betas:    1.8196  -0.1776   0.0219  -0.0040  -0.1849   1.2713   0.4758   0.7965   1.3786   0.3264  -(
##
## sigma: 0.181218
## lambda (gene 1): 0.845068
## epsilon (gene 1): 0.281558
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 30800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.166
## delta (gene 1): 17.0749
## s (cell 1): 0.947526
## nu (cell 1): 1.04223
## theta (batch 1): 0.0329921
```

```
## betas:    1.4205  -0.0996  -0.0565   0.0597   0.9133   0.5247   1.0837   0.8800   1.0028   0.7750  -(
##
## sigma: 0.184204
## lambda (gene 1): 0.473629
## epsilon (gene 1): 0.404119
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 30840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.804
## delta (gene 1): 12.7937
## s (cell 1): 1.0104
## nu (cell 1): 1.02064
## theta (batch 1): 0.0708064
## betas:    1.8642  -0.2443   0.2287  -0.4826   0.4456   0.7193   0.7350   1.0345   1.0039   0.9709  -(
##
## sigma: 0.178273
## lambda (gene 1): 0.86993
## epsilon (gene 1): 0.116127
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 30880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.029
## delta (gene 1): 14.8454
## s (cell 1): 1.44191
## nu (cell 1): 1.06563
## theta (batch 1): 0.0419022
## betas:    0.9466  -0.1836   0.0915   0.2418   0.5036   1.2924   1.0204   1.0006   1.6226   0.6709   (
##
## sigma: 0.183153
## lambda (gene 1): 0.992348
## epsilon (gene 1): 0.26339
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 30920 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.269
## delta (gene 1): 14.8206
## s (cell 1): 1.63842
## nu (cell 1): 1.03152
## theta (batch 1): 0.0840511
## betas:    0.7616  -0.0567   0.7281   0.3615   0.6848   1.3039   0.7223   1.3283   1.1815   0.6909  -(
##
## sigma: 0.174892
## lambda (gene 1): 0.542227
## epsilon (gene 1): 0.270238
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 30960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 134.208
## delta (gene 1): 15.8419
## s (cell 1): 1.02639
## nu (cell 1): 1.09982
## theta (batch 1): 0.0327142
## betas:    1.1509  -0.1537   0.6566   0.0100   0.6309   0.8606   1.1069   0.9638   1.3359   0.8054  -(
##
## sigma: 0.182891
## lambda (gene 1): 0.879918
## epsilon (gene 1): 0.345082
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 31000 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 395.32
## delta (gene 1): 12.1757
## s (cell 1): 1.50013
## nu (cell 1): 1.10551
## theta (batch 1): 0.0549737
## betas:    1.2937  -0.1214   0.5566  -0.0377   0.8128   0.7331   1.0228   0.8424   1.3258   0.5212  -(
##
## sigma: 0.17719
## lambda (gene 1): 1.08421
## epsilon (gene 1): 0.0682181
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 31040 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.128
## delta (gene 1): 14.1677
## s (cell 1): 0.768925
## nu (cell 1): 1.01456
## theta (batch 1): 0.0545017
## betas:     0.9227   -0.2203   -0.0338   -0.0714    0.4507    1.5011    0.7744    1.1197    1.8095    0.6657   -(
##
## sigma: 0.185202
## lambda (gene 1): 0.891722
## epsilon (gene 1): 0.239135
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 31080 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 338.272
## delta (gene 1): 12.4162
## s (cell 1): 1.09992
## nu (cell 1): 1.0148
## theta (batch 1): 0.0475382
## betas:     1.6964   -0.1624    0.1284   -0.1070    0.5952    0.9466    0.4833    1.2192    0.7761    1.0542   -1
##
## sigma: 0.186836
## lambda (gene 1): 3.34568
## epsilon (gene 1): 0.121066
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 31120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 170.796
## delta (gene 1): 14.175
## s (cell 1): 1.02164
## nu (cell 1): 1.01323
## theta (batch 1): 0.0232282
## betas:     1.7858   -0.1490    0.5474   -0.2896    0.5485    0.8385    0.7974    0.6908    1.1978    0.6328   -(
##
```

```
## sigma: 0.18372
## lambda (gene 1): 1.75699
## epsilon (gene 1): 0.202438
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 31160 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 324.705
## delta (gene 1): 11.6275
## s (cell 1): 1.16274
## nu (cell 1): 1.07207
## theta (batch 1): 0.0170051
## betas:    0.9544  -0.1238   0.4789   0.4792   0.5457   1.3127   0.9223   1.0757   1.2903   1.0601  -
##
## sigma: 0.174188
## lambda (gene 1): 1.4059
## epsilon (gene 1): 0.0297141
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 31200 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 317.682
## delta (gene 1): 12.0325
## s (cell 1): 1.143
## nu (cell 1): 1.10952
## theta (batch 1): 0.0364309
## betas:    1.7285  -0.1199  -0.7829   0.5906   0.8203   0.6496   0.5542   1.2192   0.6808   0.8380  -
##
## sigma: 0.182616
## lambda (gene 1): 0.602469
## epsilon (gene 1): 0.0566951
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 31240 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 276.057
```

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## delta (gene 1): 13.3389
## s (cell 1): 0.872073
## nu (cell 1): 1.14823
## theta (batch 1): 0.0521403
## betas:    1.5383  -0.1392  -0.2325   0.2950   0.5939   1.0151   0.4829   1.2175   1.0204   0.5763  -(
##
## sigma: 0.177024
## lambda (gene 1): 0.775562
## epsilon (gene 1): 0.17336
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 31280 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 274.783
## delta (gene 1): 12.928
## s (cell 1): 0.938701
## nu (cell 1): 1.07333
## theta (batch 1): 0.0178948
## betas:    1.5127  -0.2237  -0.0679   0.5808  -0.0954   1.1858   0.6605   1.0166   1.4481   0.5805  -(
##
## sigma: 0.18504
## lambda (gene 1): 2.46197
## epsilon (gene 1): 0.12304
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 31320 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 284.027
## delta (gene 1): 11.7819
## s (cell 1): 1.03817
## nu (cell 1): 1.05676
## theta (batch 1): 0.0326744
## betas:    1.5546  -0.1658   0.6146  -0.1246   0.6504   0.9821   0.7574   0.8363   1.3425   0.6304  -(
##
## sigma: 0.180175
## lambda (gene 1): 0.309965
## epsilon (gene 1): 0.0397375
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 31360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 142.696
## delta (gene 1): 14.7704
## s (cell 1): 1.07707
## nu (cell 1): 0.991697
## theta (batch 1): 0.0334913
## betas:    1.4601  -0.2390   0.5046  -0.2204   0.4252   1.1829   0.6333   1.0020   1.5905   0.5993  -(
##
## sigma: 0.179351
## lambda (gene 1): 1.03275
## epsilon (gene 1): 0.25552
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 31400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.7
## delta (gene 1): 11.6077
## s (cell 1): 0.806718
## nu (cell 1): 1.0681
## theta (batch 1): 0.0225772
## betas:    1.8057  -0.1953  -0.3386  -0.2459   0.7341   0.7203   0.7587   0.7651   1.2915   0.6656  -(
##
## sigma: 0.183275
## lambda (gene 1): 1.93683
## epsilon (gene 1): 0.0124791
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 31440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 214.803
## delta (gene 1): 15.2775
## s (cell 1): 1.31616
## nu (cell 1): 1.09202
## theta (batch 1): 0.0336228
## betas:    1.6330  -0.1128   0.0276  -0.4470   1.2089   0.8080   0.5599   1.1923   0.7365   0.7590  -(
##
## sigma: 0.188303
## lambda (gene 1): 1.45203
```

```
## epsilon (gene 1): 0.29863
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 31480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.985
## delta (gene 1): 19.9928
## s (cell 1): 0.995314
## nu (cell 1): 1.01872
## theta (batch 1): 0.0121008
## betas:    1.2877   -0.1028   -0.0773    0.1932    0.8782    0.5138    1.1113    0.9828    0.9520    0.9820   -
##
## sigma: 0.181697
## lambda (gene 1): 0.840711
## epsilon (gene 1): 0.555519
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 31520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 125.546
## delta (gene 1): 16.3953
## s (cell 1): 0.929997
## nu (cell 1): 0.993396
## theta (batch 1): 0.0205039
## betas:    1.4200   -0.1121    0.2702    0.3009    0.2783    1.2199    0.6099    1.0555    1.1308    0.5505   -
##
## sigma: 0.178977
## lambda (gene 1): 0.779005
## epsilon (gene 1): 0.354141
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 31560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 132.381
## delta (gene 1): 15.3405
## s (cell 1): 1.17405
```

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## nu (cell 1): 1.02819
## theta (batch 1): 0.0291522
## betas:    1.7176  -0.2817   0.4100  -0.5580   0.3820   0.8224   0.8399   0.8121   1.6790   0.4398
##
## sigma: 0.181378
## lambda (gene 1): 1.25576
## epsilon (gene 1): 0.305211
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 31600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 360.672
## delta (gene 1): 15.0787
## s (cell 1): 1.06018
## nu (cell 1): 0.99778
## theta (batch 1): 0.0847524
## betas:    1.3200  -0.1949  -0.3935  -0.2556   0.8878   0.9257   0.7988   1.1342   1.2327   0.9793
##
## sigma: 0.183843
## lambda (gene 1): 0.562802
## epsilon (gene 1): 0.280885
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 31640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.142
## delta (gene 1): 13.5341
## s (cell 1): 0.688213
## nu (cell 1): 1.05715
## theta (batch 1): 0.0637273
## betas:    1.9252  -0.0893   0.2038   0.4092   0.0721   0.8111   0.8357   0.5261   1.0843   0.3968
##
## sigma: 0.185766
## lambda (gene 1): 0.908057
## epsilon (gene 1): 0.173466
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
```

```
## Iteration 31680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.447
## delta (gene 1): 11.3356
## s (cell 1): 1.35923
## nu (cell 1): 1.0726
## theta (batch 1): 0.0478719
## betas:    1.1823  -0.1899   0.3289   0.0308   0.4855   1.3342   0.6377   1.2273   1.4416   0.5303   (
##
## sigma: 0.175741
## lambda (gene 1): 0.655463
## epsilon (gene 1): 0.00058504
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 31720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.093
## delta (gene 1): 11.9903
## s (cell 1): 1.46874
## nu (cell 1): 1.03069
## theta (batch 1): 0.0346002
## betas:    1.2379  -0.2114   0.3376   0.9370   0.2786   1.1516   0.8086   1.1119   1.4028   0.8271  -(
##
## sigma: 0.193755
## lambda (gene 1): 1.74986
## epsilon (gene 1): 0.0535282
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 31760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.119
## delta (gene 1): 11.906
## s (cell 1): 1.6117
## nu (cell 1): 1.05762
## theta (batch 1): 0.0501123
## betas:    1.6381  -0.1708  -0.0455  -0.0246   0.5846   0.8741   0.7946   0.8306   1.3263   0.4280  -(
##
## sigma: 0.185454
## lambda (gene 1): 0.987416
## epsilon (gene 1): 0.0666122
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 31800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 185.53
## delta (gene 1): 14.6308
## s (cell 1): 1.07498
## nu (cell 1): 1.0931
## theta (batch 1): 0.0289011
## betas:    1.9982  -0.2105  -0.4663   0.0908  -0.0269   0.9961   0.5953   0.7723   1.1694   0.7157  -(
##
## sigma: 0.182554
## lambda (gene 1): 1.04531
## epsilon (gene 1): 0.240512
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 31840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 126.635
## delta (gene 1): 17.0384
## s (cell 1): 0.839893
## nu (cell 1): 0.972056
## theta (batch 1): 0.0528226
## betas:    1.3356  -0.0887   0.1352   0.2730   0.4047   1.0055   1.0219   0.8533   1.0762   0.7692  -:
##
## sigma: 0.181759
## lambda (gene 1): 1.44805
## epsilon (gene 1): 0.415982
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 31880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 165.041
## delta (gene 1): 14.5722
## s (cell 1): 1.01299
## nu (cell 1): 1.05738
## theta (batch 1): 0.0154604
```

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## betas:    1.3216  -0.1711   0.2643  -0.0334   0.3789   0.8908   1.0931   0.8388   1.3789   0.7512  -(
##
## sigma: 0.18473
## lambda (gene 1): 0.393573
## epsilon (gene 1): 0.239819
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 31920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 158.024
## delta (gene 1): 17.2383
## s (cell 1): 1.05462
## nu (cell 1): 1.10191
## theta (batch 1): 0.0137799
## betas:    1.2831  -0.0957   0.3607   0.5831   0.4985   0.8333   1.1662   0.6502   1.3619   0.6213  -(
##
## sigma: 0.1812
## lambda (gene 1): 0.606429
## epsilon (gene 1): 0.394461
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 31960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.445
## delta (gene 1): 13.7303
## s (cell 1): 0.983304
## nu (cell 1): 1.04034
## theta (batch 1): 0.0185682
## betas:    1.4263  -0.2417   0.3188  -0.5896   0.4892   1.3569   0.4240   1.2543   1.5028   0.5081  -(
##
## sigma: 0.184707
## lambda (gene 1): 0.485449
## epsilon (gene 1): 0.23313
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 32000 out of 40000 has been completed.
## --------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 337.336
## delta (gene 1): 17.6722
## s (cell 1): 1.08854
## nu (cell 1): 1.00413
## theta (batch 1): 0.0438178
## betas:    1.1220  -0.1576  -0.0516   0.5447   0.0368   1.3128   0.8858   1.0371   1.3171   0.8967  -(
##
## sigma: 0.183544
## lambda (gene 1): 0.426571
## epsilon (gene 1): 0.435763
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 32040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.287
## delta (gene 1): 11.0441
## s (cell 1): 0.975847
## nu (cell 1): 1.06041
## theta (batch 1): 0.0209369
## betas:    0.7707  -0.2304   0.6704   0.3218   0.4653   1.1048   1.4082   0.8851   1.8627   0.9270  -(
##
## sigma: 0.178429
## lambda (gene 1): 0.758014
## epsilon (gene 1): -0.0250851
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 32080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 237.256
## delta (gene 1): 13.6006
## s (cell 1): 1.08048
## nu (cell 1): 1.10489
## theta (batch 1): 0.00997703
## betas:    1.2391  -0.0669   0.2502   0.4301   0.7118   0.7326   0.8934   0.9736   1.1711   0.4639  -(
##
## sigma: 0.178582
## lambda (gene 1): 0.952159
## epsilon (gene 1): 0.17557
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32120 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.719
## delta (gene 1): 16.9994
## s (cell 1): 1.21986
## nu (cell 1): 1.13027
## theta (batch 1): 0.0126835
## betas:    1.7444  -0.1641   1.0465  -0.0019   0.0089   1.0860   0.6512   0.9217   1.1048   0.6450  -(
##
## sigma: 0.192713
## lambda (gene 1): 0.471005
## epsilon (gene 1): 0.401223
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32160 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.261
## delta (gene 1): 14.3104
## s (cell 1): 0.989364
## nu (cell 1): 0.973409
## theta (batch 1): 0.036196
## betas:    1.8382  -0.3192   0.6380   0.0133   0.2095   0.7605   0.5687   1.2953   1.1237   1.0045  -(
##
## sigma: 0.182055
## lambda (gene 1): 2.37663
## epsilon (gene 1): 0.218226
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32200 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 199.065
## delta (gene 1): 16.0403
## s (cell 1): 1.06789
## nu (cell 1): 1.09211
## theta (batch 1): 0.0226514
## betas:    1.5625  -0.1422  -0.3332   0.4485   0.6617   0.4263   1.1329   0.7557   1.1088   0.8219  -(
##
```

```
## sigma: 0.17731
## lambda (gene 1): 1.0614
## epsilon (gene 1): 0.340112
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32240 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 241.783
## delta (gene 1): 14.1901
## s (cell 1): 1.15979
## nu (cell 1): 1.17202
## theta (batch 1): 0.00552379
## betas:    1.8681   -0.2185   -0.4848    0.2488    0.4311    0.7254    0.5407    1.1252    0.9374    0.9341   -(
##
## sigma: 0.180649
## lambda (gene 1): 0.280138
## epsilon (gene 1): 0.22728
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 340.613
## delta (gene 1): 12.3721
## s (cell 1): 1.0111
## nu (cell 1): 1.10599
## theta (batch 1): 0.00674475
## betas:    1.0722   -0.1236    0.1773    0.5976    0.4226    1.3731    0.5243    1.4501    1.0322    0.7864   -(
##
## sigma: 0.161077
## lambda (gene 1): 0.293697
## epsilon (gene 1): 0.085389
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 126.072
```

```
## delta (gene 1): 14.359
## s (cell 1): 0.956606
## nu (cell 1): 1.09671
## theta (batch 1): 0.0115024
## betas:    1.3041  -0.2098  -0.0762   0.2682  -0.1349   1.6335   0.5682   1.0162   1.6095   0.6138  -(
##
## sigma: 0.180399
## lambda (gene 1): 0.872754
## epsilon (gene 1): 0.230758
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 32360 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.425
## delta (gene 1): 15.3331
## s (cell 1): 0.903435
## nu (cell 1): 1.00738
## theta (batch 1): 0.0197473
## betas:    1.4790  -0.3044  -0.6546   0.0698   0.3820   0.9622   0.7808   1.0615   1.6310   0.7057   (
##
## sigma: 0.175107
## lambda (gene 1): 1.33113
## epsilon (gene 1): 0.30348
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 32400 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 337.782
## delta (gene 1): 16.9594
## s (cell 1): 1.01388
## nu (cell 1): 1.11093
## theta (batch 1): 0.0210584
## betas:    1.1589  -0.2970   0.6465  -0.0970   0.0544   1.5491   0.5648   1.3042   1.6681   0.9536  -(
##
## sigma: 0.188028
## lambda (gene 1): 0.954707
## epsilon (gene 1): 0.395755
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 200.52
## delta (gene 1): 16.295
## s (cell 1): 0.895715
## nu (cell 1): 1.08741
## theta (batch 1): 0.0159589
## betas:    1.5524  -0.1792   0.5051  -0.0087   0.1240   1.4864   0.4170   0.9785   1.4950   0.2542  -(
##
## sigma: 0.182289
## lambda (gene 1): 1.37402
## epsilon (gene 1): 0.38496
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.863
## delta (gene 1): 14.2288
## s (cell 1): 1.07913
## nu (cell 1): 1.08553
## theta (batch 1): 0.0151214
## betas:    1.4201  -0.1277   0.1814   0.2603   0.8221   0.9240   0.6648   1.1241   0.9493   1.0149  -(
##
## sigma: 0.179008
## lambda (gene 1): 1.53558
## epsilon (gene 1): 0.18761
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 32520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 270.588
## delta (gene 1): 13.413
## s (cell 1): 0.828482
## nu (cell 1): 0.984897
## theta (batch 1): 0.0121907
## betas:    0.9988  -0.1282   0.1744   0.3073   0.4020   1.2688   1.0096   0.8311   1.7400   0.2859   (
##
## sigma: 0.17596
## lambda (gene 1): 1.96267
```

```
## epsilon (gene 1): 0.160021
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 32560 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 285.473
## delta (gene 1): 14.3983
## s (cell 1): 1.25933
## nu (cell 1): 1.15735
## theta (batch 1): 0.00697205
## betas:    1.6293  -0.1712   0.0284  -0.3230   0.2631   1.2387   0.4046   1.2542   0.9449   0.7472  -(
##
## sigma: 0.187858
## lambda (gene 1): 0.819341
## epsilon (gene 1): 0.241248
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 32600 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 228.983
## delta (gene 1): 15.4007
## s (cell 1): 1.06841
## nu (cell 1): 1.1161
## theta (batch 1): 0.00640734
## betas:    1.4520  -0.2029  -0.4263  -0.3289   0.6212   1.1096   0.6516   1.1922   1.0653   1.1159  -(
##
## sigma: 0.186009
## lambda (gene 1): 0.888321
## epsilon (gene 1): 0.296622
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 32640 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 283.201
## delta (gene 1): 15.3947
## s (cell 1): 1.1101
```

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## nu (cell 1): 1.05988
## theta (batch 1): 0.00285403
## betas:    0.9349  -0.0533  -0.6009   0.8524   0.2913   1.1459   1.2693   0.5339   1.7510   0.2639  -
##
## sigma: 0.188495
## lambda (gene 1): 1.91497
## epsilon (gene 1): 0.3186
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 32680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.545
## delta (gene 1): 18.7651
## s (cell 1): 1.0037
## nu (cell 1): 1.01716
## theta (batch 1): 0.00102502
## betas:    1.1194  -0.0822  -0.0364   0.1242   0.7196   1.1113   0.8606   0.9616   1.2283   0.7715  -
##
## sigma: 0.193224
## lambda (gene 1): 1.32076
## epsilon (gene 1): 0.50123
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 32720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.386
## delta (gene 1): 14.8287
## s (cell 1): 1.18646
## nu (cell 1): 1.19766
## theta (batch 1): 0.000938741
## betas:    1.7498  -0.1867   0.5186  -0.4054   0.1645   0.5176   1.2411   0.3891   1.5921   0.3645  -
##
## sigma: 0.173509
## lambda (gene 1): 1.25592
## epsilon (gene 1): 0.277845
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
```

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## Iteration 32760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 329.176
## delta (gene 1): 14.7287
## s (cell 1): 1.11258
## nu (cell 1): 1.11463
## theta (batch 1): 0.0040622
## betas:    1.2332  -0.1789  -0.4921   0.4785  -0.1619   1.5569   0.5074   1.3592   1.1174   0.8895  -(
##
## sigma: 0.171001
## lambda (gene 1): 0.479324
## epsilon (gene 1): 0.262387
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 32800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.653
## delta (gene 1): 9.5976
## s (cell 1): 1.06113
## nu (cell 1): 1.05042
## theta (batch 1): 0.00367111
## betas:    1.0165  -0.1195  -0.2578  -0.5193   1.5362   0.8986   0.8442   1.3231   1.0743   0.8139  -(
##
## sigma: 0.184988
## lambda (gene 1): 1.5004
## epsilon (gene 1): -0.16597
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 32840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.776
## delta (gene 1): 17.8369
## s (cell 1): 1.01892
## nu (cell 1): 1.05468
## theta (batch 1): 0.00158398
## betas:    0.7128  -0.1752  -0.4211   0.5757   0.4445   1.3091   1.0030   1.2256   1.5579   0.8903  -(
##
## sigma: 0.175584
## lambda (gene 1): 0.321459
## epsilon (gene 1): 0.458693
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 32880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 211.124
## delta (gene 1): 12.7147
## s (cell 1): 1.15347
## nu (cell 1): 1.06444
## theta (batch 1): 0.00293845
## betas:    0.9780  -0.1463  -0.1597   0.4659   0.5928   1.2862   0.8950   1.1955   1.1776   1.0741  -(
##
## sigma: 0.183827
## lambda (gene 1): 2.28803
## epsilon (gene 1): 0.105227
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 32920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.916
## delta (gene 1): 12.0676
## s (cell 1): 1.04093
## nu (cell 1): 0.997436
## theta (batch 1): 0.00145633
## betas:    1.2745  -0.0845   0.4227  -0.1161   0.7011   0.8024   0.9351   1.0052   1.1068   0.5439  -(
##
## sigma: 0.182588
## lambda (gene 1): 3.1183
## epsilon (gene 1): 0.0537434
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 32960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 190.044
## delta (gene 1): 13.5656
## s (cell 1): 1.09496
## nu (cell 1): 1.10145
## theta (batch 1): 0.000251191
```

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## betas:     1.3648   -0.2009   -0.1326   -0.1841    0.4646    1.0879    0.8282    0.9457    1.4662    0.6487   -(
##
## sigma: 0.184563
## lambda (gene 1): 1.47374
## epsilon (gene 1): 0.172629
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 33000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 341.755
## delta (gene 1): 13.3559
## s (cell 1): 1.26041
## nu (cell 1): 1.19038
## theta (batch 1): 0.000678829
## betas:     0.8622   -0.2355    0.2808   -0.3897    0.9037    1.4124    0.5857    1.5282    1.5147    0.9176   -(
##
## sigma: 0.182298
## lambda (gene 1): 2.50044
## epsilon (gene 1): 0.171625
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 33040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.496
## delta (gene 1): 15.4239
## s (cell 1): 1.01292
## nu (cell 1): 0.991421
## theta (batch 1): 0.00127003
## betas:     1.6457   -0.2875   -0.4780    0.0170    0.8072    0.7744    0.7073    1.0170    1.5739    0.4923    (
##
## sigma: 0.173259
## lambda (gene 1): 1.71374
## epsilon (gene 1): 0.329264
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 33080 out of 40000 has been completed.
## --------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.973
## delta (gene 1): 15.1344
## s (cell 1): 1.07294
## nu (cell 1): 1.09735
## theta (batch 1): 0.00165031
## betas:    1.4266  -0.1544  -0.0141   0.5489   0.2776   1.2034   0.7198   0.8675   1.4537   0.4209  -(
##
## sigma: 0.185137
## lambda (gene 1): 1.11276
## epsilon (gene 1): 0.263887
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 33120 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.703
## delta (gene 1): 15.744
## s (cell 1): 0.991529
## nu (cell 1): 0.973347
## theta (batch 1): 0.00204487
## betas:    1.4975  -0.1242  -0.2969   0.1199   0.8243   0.3565   1.2882   0.7613   1.0480   0.8258  -(
##
## sigma: 0.17384
## lambda (gene 1): 0.980434
## epsilon (gene 1): 0.32405
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 33160 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 223.998
## delta (gene 1): 12.4221
## s (cell 1): 1.01426
## nu (cell 1): 1.05686
## theta (batch 1): 0.00163097
## betas:    1.9565  -0.2377   0.0420  -0.0125   0.1339   0.8874   0.5566   0.9524   1.1494   0.6931  -(
##
## sigma: 0.178942
## lambda (gene 1): 0.622099
## epsilon (gene 1): 0.0870969
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

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## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 33200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.108
## delta (gene 1): 15.3079
## s (cell 1): 1.14696
## nu (cell 1): 1.07832
## theta (batch 1): 0.00268922
## betas:    1.2484  -0.2067  -0.7015   0.3553   0.7924   0.8429   0.8756   1.0960   1.5686   0.3675   (
##
## sigma: 0.180917
## lambda (gene 1): 1.33557
## epsilon (gene 1): 0.311279
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 33240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.691
## delta (gene 1): 14.9314
## s (cell 1): 1.08393
## nu (cell 1): 1.06293
## theta (batch 1): 0.000737552
## betas:    1.4780  -0.2170  -0.3702   0.4203   0.9786   0.4190   0.8552   1.1903   1.1544   0.9483   -(
##
## sigma: 0.179909
## lambda (gene 1): 0.309229
## epsilon (gene 1): 0.277447
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 33280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.357
## delta (gene 1): 12.5347
## s (cell 1): 1.08532
## nu (cell 1): 1.08522
## theta (batch 1): 0.000152683
## betas:    1.5210  -0.2020   0.3129   0.0528   0.1061   1.4618   0.3804   1.2542   1.1302   0.8028   -(
##
```

```
## sigma: 0.185053
## lambda (gene 1): 1.9583
## epsilon (gene 1): 0.0993749
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 33320 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 294.166
## delta (gene 1): 14.6794
## s (cell 1): 1.04261
## nu (cell 1): 1.03632
## theta (batch 1): 0.000113562
## betas:    1.5255  -0.0747   0.0869   0.3441   0.5415   0.6847   0.9458   0.8840   0.9788   0.5240  -(
##
## sigma: 0.187417
## lambda (gene 1): 1.87305
## epsilon (gene 1): 0.259873
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 33360 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 113.62
## delta (gene 1): 16.2475
## s (cell 1): 1.01715
## nu (cell 1): 1.03019
## theta (batch 1): 0.000477781
## betas:    1.1082  -0.1956  -0.0192   0.5500   0.1837   1.3843   0.8898   0.9916   1.5512   0.8377  -(
##
## sigma: 0.182457
## lambda (gene 1): 0.982483
## epsilon (gene 1): 0.357824
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 33400 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.518
```

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## delta (gene 1): 13.786
## s (cell 1): 1.03715
## nu (cell 1): 1.04051
## theta (batch 1): 0.000435796
## betas:    1.1432  -0.1534   0.2902   0.0206   0.0130   1.3253   0.9150   0.8730   1.5827   0.5468  -0
##
## sigma: 0.181099
## lambda (gene 1): 0.937806
## epsilon (gene 1): 0.170154
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 33440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 127.231
## delta (gene 1): 12.8592
## s (cell 1): 0.991572
## nu (cell 1): 0.995323
## theta (batch 1): 0.00100534
## betas:    1.0139  -0.1652   0.1356  -0.1807   1.0224   0.8381   1.1457   0.8545   1.6121   0.8330  -0
##
## sigma: 0.177079
## lambda (gene 1): 1.71284
## epsilon (gene 1): 0.128546
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 33480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 271.76
## delta (gene 1): 13.0554
## s (cell 1): 0.988675
## nu (cell 1): 1.02753
## theta (batch 1): 0.00371959
## betas:    1.7848  -0.0651  -0.0321   0.2380   0.5482   0.8126   0.7134   0.7146   0.8630   0.6766  -
##
## sigma: 0.167248
## lambda (gene 1): 1.48714
## epsilon (gene 1): 0.112246
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 33520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 318.6
## delta (gene 1): 12.3302
## s (cell 1): 0.955933
## nu (cell 1): 1.07868
## theta (batch 1): 0.00689408
## betas:    1.4308  -0.0651   0.4493   0.2310   0.8430   0.6698   1.0798   0.6493   1.2793   0.2285  -(
##
## sigma: 0.178857
## lambda (gene 1): 1.07132
## epsilon (gene 1): 0.066353
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 33560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.027
## delta (gene 1): 13.7011
## s (cell 1): 1.00617
## nu (cell 1): 0.99929
## theta (batch 1): 0.000676436
## betas:    1.2074  -0.2544  -0.5092  -0.3864   0.8581   0.8100   0.9861   1.1274   1.4844   0.9127  -(
##
## sigma: 0.183398
## lambda (gene 1): 1.26147
## epsilon (gene 1): 0.189738
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 33600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.347
## delta (gene 1): 13.8618
## s (cell 1): 1.03348
## nu (cell 1): 1.06885
## theta (batch 1): 0.000822599
## betas:    1.1531  -0.1723  -0.0496  -0.0346   0.6147   1.1487   0.7344   1.3083   1.2132   0.8059  -(
##
## sigma: 0.177566
## lambda (gene 1): 1.9828
```

```
## epsilon (gene 1): 0.223452
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 33640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.666
## delta (gene 1): 15.2021
## s (cell 1): 1.07485
## nu (cell 1): 1.09268
## theta (batch 1): 0.00124822
## betas:    1.2069  -0.1920  -0.5165   0.0749   0.9388   0.7164   1.1545   0.8527   1.5406   0.7259  -(
##
## sigma: 0.16828
## lambda (gene 1): 0.884081
## epsilon (gene 1): 0.295966
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 33680 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.617
## delta (gene 1): 14.4441
## s (cell 1): 1.1087
## nu (cell 1): 1.12918
## theta (batch 1): 0.00390876
## betas:    1.4639  -0.2033   0.6238  -0.1800   0.5392   0.7589   0.9013   1.0926   1.1874   0.6981   (
##
## sigma: 0.187325
## lambda (gene 1): 1.12685
## epsilon (gene 1): 0.227977
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 33720 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.119
## delta (gene 1): 13.1388
## s (cell 1): 1.1159
```

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## nu (cell 1): 1.06933
## theta (batch 1): 0.0120187
## betas:    1.6791  -0.1752  -0.0784   0.0887   0.6619   0.7771   0.7593   0.8449   1.3411   0.3536  -0
##
## sigma: 0.172025
## lambda (gene 1): 1.75367
## epsilon (gene 1): 0.152244
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 33760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 517.104
## delta (gene 1): 16.1223
## s (cell 1): 1.12482
## nu (cell 1): 0.976037
## theta (batch 1): 0.0278559
## betas:    1.4683  -0.2116  -0.2975  -0.0686   0.3064   1.2776   0.8080   0.7875   1.5325   0.7804  -0
##
## sigma: 0.181571
## lambda (gene 1): 0.792485
## epsilon (gene 1): 0.325143
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 33800 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 225.49
## delta (gene 1): 17.2146
## s (cell 1): 0.917291
## nu (cell 1): 1.04781
## theta (batch 1): 0.027734
## betas:    1.0674  -0.1742  -0.1160  -0.0696   0.6144   1.1039   1.0744   0.7668   1.7158   0.7568  -0
##
## sigma: 0.185276
## lambda (gene 1): 1.40136
## epsilon (gene 1): 0.423119
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
```

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## Iteration 33840 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 242.097
## delta (gene 1): 10.5506
## s (cell 1): 0.927766
## nu (cell 1): 1.02946
## theta (batch 1): 0.0338466
## betas:     1.1170  -0.1579   0.4686   0.9534   0.1076   1.0257   1.0176   1.1188   1.2055   0.9404  -(
##
## sigma: 0.178902
## lambda (gene 1): 1.78087
## epsilon (gene 1): -0.0928188
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 33880 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 164.35
## delta (gene 1): 15.6723
## s (cell 1): 1.35588
## nu (cell 1): 1.15512
## theta (batch 1): 0.0194715
## betas:     1.5443  -0.2913  -0.0220   0.4570   0.4287   0.9062   0.5466   1.4058   1.2240   0.9250  -(
##
## sigma: 0.178979
## lambda (gene 1): 1.51053
## epsilon (gene 1): 0.341924
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 33920 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.275
## delta (gene 1): 15.2104
## s (cell 1): 0.924368
## nu (cell 1): 1.06372
## theta (batch 1): 0.0239267
## betas:     1.6516  -0.1831   0.4714  -0.5096   0.6745   0.8321   0.8155   0.8363   1.2573   0.6844  -(
##
## sigma: 0.180805
## lambda (gene 1): 2.64574
## epsilon (gene 1): 0.287369
## ----------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 33960 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.923
## delta (gene 1): 11.1748
## s (cell 1): 0.922367
## nu (cell 1): 0.99942
## theta (batch 1): 0.0270954
## betas:    1.4409  -0.2805   0.4291  -0.1153   0.3084   1.1693   0.6626   1.1095   1.6243   0.5721   (
##
## sigma: 0.16925
## lambda (gene 1): 0.619019
## epsilon (gene 1): 0.0053033
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 34000 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 203.097
## delta (gene 1): 18.0066
## s (cell 1): 1.2525
## nu (cell 1): 1.09339
## theta (batch 1): 0.00943209
## betas:    1.3215  -0.2020   0.7876   0.1111  -0.0058   1.3584   0.8403   0.8292   1.7305   0.3573   (
##
## sigma: 0.179504
## lambda (gene 1): 1.53674
## epsilon (gene 1): 0.46931
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 34040 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 172.032
## delta (gene 1): 13.2058
## s (cell 1): 1.11484
## nu (cell 1): 1.14886
## theta (batch 1): 0.00506742
```

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## betas:     1.0727  -0.0874   0.2469   0.8359   0.6205   0.9445   0.9013   1.0717   1.2408   0.6841  -(
##
## sigma: 0.178844
## lambda (gene 1): 1.38692
## epsilon (gene 1): 0.150041
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 34080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 306.059
## delta (gene 1): 12.3578
## s (cell 1): 1.49214
## nu (cell 1): 1.08033
## theta (batch 1): 0.0137395
## betas:     1.4716  -0.2819   0.1563  -0.0727   0.2371   0.7687   1.5699   0.2585   2.0941   0.4709   (
##
## sigma: 0.181242
## lambda (gene 1): 0.979727
## epsilon (gene 1): 0.0744763
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 34120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 304.552
## delta (gene 1): 15.494
## s (cell 1): 0.989421
## nu (cell 1): 1.07525
## theta (batch 1): 0.0130585
## betas:     1.7773  -0.1709   0.5264  -0.1467   0.4273   0.7394   0.9079   0.5364   1.5350   0.2728  -(
##
## sigma: 0.175979
## lambda (gene 1): 1.93687
## epsilon (gene 1): 0.30191
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 34160 out of 40000 has been completed.
## -------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 234.988
## delta (gene 1): 12.6148
## s (cell 1): 0.946686
## nu (cell 1): 1.08529
## theta (batch 1): 0.0229681
## betas:    1.7531  -0.2107   0.1051  -0.0945   0.3615   0.7414   0.8577   0.6752   1.5883   0.1999   (
##
## sigma: 0.175698
## lambda (gene 1): 0.919864
## epsilon (gene 1): 0.107444
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 34200 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 193.896
## delta (gene 1): 15.3403
## s (cell 1): 1.08206
## nu (cell 1): 1.04638
## theta (batch 1): 0.0328508
## betas:    1.6013  -0.2037  -0.5361  -0.3989   0.6892   0.7073   0.9290   0.7476   1.4422   0.6895  -(
##
## sigma: 0.177475
## lambda (gene 1): 1.29922
## epsilon (gene 1): 0.311192
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 34240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 292.764
## delta (gene 1): 11.6696
## s (cell 1): 1.12905
## nu (cell 1): 1.1015
## theta (batch 1): 0.00541894
## betas:    1.0539  -0.1816   1.6073   0.2457   0.5724   0.9980   0.9929   1.0948   1.5132   0.6211  -(
##
## sigma: 0.172452
## lambda (gene 1): 0.421958
## epsilon (gene 1): 0.0364638
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34280 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 299.86
## delta (gene 1): 17.8694
## s (cell 1): 1.10677
## nu (cell 1): 1.06165
## theta (batch 1): 0.0028984
## betas:    1.9598  -0.2618  -0.3451  -0.3072   0.2719   0.9646   0.6848   0.7600   1.3533   0.6932  -(
##
## sigma: 0.179868
## lambda (gene 1): 0.429647
## epsilon (gene 1): 0.444372
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34320 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 210.554
## delta (gene 1): 13.7592
## s (cell 1): 1.06324
## nu (cell 1): 1.10862
## theta (batch 1): 0.00495345
## betas:    1.3512  -0.2593   0.0630  -0.0943   0.1677   1.1676   0.8360   1.1044   1.4227   0.8648   (
##
## sigma: 0.176866
## lambda (gene 1): 2.37438
## epsilon (gene 1): 0.177476
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34360 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 245.231
## delta (gene 1): 14.3184
## s (cell 1): 0.931166
## nu (cell 1): 1.07166
## theta (batch 1): 0.00999591
## betas:    1.7786  -0.1659  -0.6417  -0.4237   0.2605   0.9905   0.7672   0.7216   1.1622   0.8088  -
##
```

```
## sigma: 0.182905
## lambda (gene 1): 1.00928
## epsilon (gene 1): 0.219853
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34400 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 191.217
## delta (gene 1): 14.3389
## s (cell 1): 1.0961
## nu (cell 1): 1.11183
## theta (batch 1): 0.00216089
## betas:    1.2803  -0.1390   0.1939   0.1556   0.6684   0.7209   1.3093   0.5712   1.5056   0.7688  -0
##
## sigma: 0.18663
## lambda (gene 1): 1.06808
## epsilon (gene 1): 0.234968
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34440 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 258.788
## delta (gene 1): 18.5208
## s (cell 1): 1.04506
## nu (cell 1): 1.08419
## theta (batch 1): 0.00244318
## betas:    1.1763  -0.1439  -0.2475   0.1029   0.5427   1.1696   0.6596   1.2802   1.1730   0.7385  -0
##
## sigma: 0.176358
## lambda (gene 1): 1.97324
## epsilon (gene 1): 0.466488
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34480 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 254.55
```

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## delta (gene 1): 11.1987
## s (cell 1): 1.02129
## nu (cell 1): 1.03079
## theta (batch 1): 0.00522715
## betas:     0.5121    0.0221    0.1865    0.8326    0.8067    1.5582    0.8573    1.1728    1.3543    0.3369   -(
##
## sigma: 0.183651
## lambda (gene 1): 0.423713
## epsilon (gene 1): -0.00403891
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 34520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 373.217
## delta (gene 1): 16.206
## s (cell 1): 1.35931
## nu (cell 1): 1.12094
## theta (batch 1): 0.0149041
## betas:     0.7755   -0.1287    0.0658   -0.5064    0.6994    1.6566    0.8318    1.0248    1.6999    0.5730   -(
##
## sigma: 0.178424
## lambda (gene 1): 1.01226
## epsilon (gene 1): 0.348802
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 34560 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 242.916
## delta (gene 1): 14.5167
## s (cell 1): 1.1619
## nu (cell 1): 1.0887
## theta (batch 1): 0.0131236
## betas:     1.1643   -0.0773    0.1366   -0.1653    1.2344    1.0910    0.7005    0.9428    1.3347    0.5448   -(
##
## sigma: 0.183514
## lambda (gene 1): 0.562981
## epsilon (gene 1): 0.237036
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 285.451
## delta (gene 1): 18.5778
## s (cell 1): 1.07996
## nu (cell 1): 1.05119
## theta (batch 1): 0.0236555
## betas:    1.0593  -0.1510  -0.3696   0.3793   0.8153   0.9314   0.9559   1.1724   1.1693   1.0209  -
##
## sigma: 0.178606
## lambda (gene 1): 1.50393
## epsilon (gene 1): 0.467715
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.21
## delta (gene 1): 11.7566
## s (cell 1): 0.709749
## nu (cell 1): 1.02362
## theta (batch 1): 0.0317036
## betas:    1.1213  -0.0310   0.2138   0.3704   1.3649   0.8949   0.7109   1.2023   0.8927   0.7689  -
##
## sigma: 0.171811
## lambda (gene 1): 1.44679
## epsilon (gene 1): 0.0399236
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 34680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.839
## delta (gene 1): 16.5763
## s (cell 1): 1.04681
## nu (cell 1): 1.0105
## theta (batch 1): 0.00643417
## betas:    1.4361  -0.1562   0.2314   0.0504   0.3653   1.1780   0.6736   1.1021   1.0790   0.9555  -
##
## sigma: 0.184256
## lambda (gene 1): 0.531873
```

```
## epsilon (gene 1): 0.389068
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 34720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.624
## delta (gene 1): 11.4541
## s (cell 1): 0.819801
## nu (cell 1): 0.991412
## theta (batch 1): 0.0234296
## betas:    1.7573  -0.2319   0.2678  -0.3072   0.4684   0.9578   0.5188   1.2186   0.9515   0.9873  -(
##
## sigma: 0.179987
## lambda (gene 1): 0.275225
## epsilon (gene 1): 0.00494444
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 34760 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 148.343
## delta (gene 1): 16.0683
## s (cell 1): 1.15895
## nu (cell 1): 1.11897
## theta (batch 1): 0.00508927
## betas:    1.7960  -0.1585  -0.0435   0.0808   0.4756   0.8720   0.4784   1.1421   0.8947   0.7063  -(
##
## sigma: 0.178199
## lambda (gene 1): 1.55825
## epsilon (gene 1): 0.341346
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 34800 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 224.836
## delta (gene 1): 16.7478
## s (cell 1): 1.02292
```

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## nu (cell 1): 1.02607
## theta (batch 1): 0.00533351
## betas:     0.7349   -0.0264    0.0534    0.5487    1.1518    1.3393    0.7898    1.1008    1.4629    0.2115   -(
##
## sigma: 0.184534
## lambda (gene 1): 0.682394
## epsilon (gene 1): 0.392039
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 34840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 233.64
## delta (gene 1): 10.5718
## s (cell 1): 1.05871
## nu (cell 1): 1.11503
## theta (batch 1): 0.00285951
## betas:     1.0543   -0.1271    0.0033    0.5218    0.1048    1.4115    0.8474    1.0439    1.3081    0.8392   -(
##
## sigma: 0.176929
## lambda (gene 1): 0.0686765
## epsilon (gene 1): -0.0710383
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 34880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 353.922
## delta (gene 1): 16.8698
## s (cell 1): 1.02377
## nu (cell 1): 1.00802
## theta (batch 1): 0.00113934
## betas:     1.7853   -0.2833   -0.2313    0.3727   -0.1015    0.5196    1.1540    0.8903    1.0895    1.1975   -(
##
## sigma: 0.180753
## lambda (gene 1): 0.230477
## epsilon (gene 1): 0.385363
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
```

```
## Iteration 34920 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 205.327
## delta (gene 1): 12.3955
## s (cell 1): 1.06151
## nu (cell 1): 1.08225
## theta (batch 1): 0.00156201
## betas:    1.1110  -0.2436   0.4312  -0.1655   1.0137   1.0067   0.6686   1.4461   1.3507   0.9608   (
##
## sigma: 0.182445
## lambda (gene 1): 0.876975
## epsilon (gene 1): 0.0809801
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 34960 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.379
## delta (gene 1): 13.5854
## s (cell 1): 1.05187
## nu (cell 1): 1.03642
## theta (batch 1): 0.000695926
## betas:    1.6335  -0.2334   0.0265  -0.4146   0.1485   1.1747   0.4757   1.2093   1.1529   0.7983  -(
##
## sigma: 0.179649
## lambda (gene 1): 1.327
## epsilon (gene 1): 0.185424
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 35000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 209.81
## delta (gene 1): 12.2619
## s (cell 1): 1.09789
## nu (cell 1): 1.1023
## theta (batch 1): 0.000619409
## betas:    0.9683  -0.0573  -0.0145   0.2478   0.6796   1.6033   0.4992   1.2850   1.0854   0.7426  -(
##
## sigma: 0.182541
## lambda (gene 1): 1.19499
## epsilon (gene 1): 0.0726721
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 216.684
## delta (gene 1): 13.7893
## s (cell 1): 1.09414
## nu (cell 1): 1.1188
## theta (batch 1): 0.000497856
## betas:    1.1453  -0.2263   0.0673  -0.4541   0.6537   1.1567   0.8276   1.2855   1.1550   1.3712  -(
##
## sigma: 0.181255
## lambda (gene 1): 0.947799
## epsilon (gene 1): 0.189173
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.583
## delta (gene 1): 16.2106
## s (cell 1): 1.14013
## nu (cell 1): 1.0825
## theta (batch 1): 0.00111818
## betas:    1.6767  -0.2174   0.3780  -0.4560   0.5841   0.8316   0.8693   0.6445   1.7887   0.0598   (
##
## sigma: 0.182965
## lambda (gene 1): 0.417331
## epsilon (gene 1): 0.37103
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 167.334
## delta (gene 1): 21.9021
## s (cell 1): 1.04674
## nu (cell 1): 1.06496
## theta (batch 1): 0.000874305
```

```
## betas:     1.0995  -0.1966  -0.2517  -0.0631   1.2228   0.7256   1.0382   1.1802   1.2001   1.1985  -(
##
## sigma: 0.179124
## lambda (gene 1): 0.364112
## epsilon (gene 1): 0.630785
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.649
## delta (gene 1): 12.8604
## s (cell 1): 1.07244
## nu (cell 1): 1.03922
## theta (batch 1): 0.0013457
## betas:     1.6586  -0.1694   0.2641   0.1444   0.3669   0.9641   0.8360   0.6267   1.4540   0.5779  -(
##
## sigma: 0.190476
## lambda (gene 1): 1.47251
## epsilon (gene 1): 0.102702
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 201.622
## delta (gene 1): 12.4195
## s (cell 1): 1.16443
## nu (cell 1): 1.08861
## theta (batch 1): 0.00165024
## betas:     1.6357  -0.2296  -0.3325   0.0516   0.4197   1.1303   0.6480   0.8922   1.4768   0.6052  -(
##
## sigma: 0.178077
## lambda (gene 1): 1.20976
## epsilon (gene 1): 0.102707
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35240 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.404
## delta (gene 1): 13.9776
## s (cell 1): 1.09115
## nu (cell 1): 1.05132
## theta (batch 1): 0.00325872
## betas:    1.4115  -0.0867   0.2219   0.4801   0.3890   1.0929   0.7739   0.8907   1.1788   0.5110  -(
##
## sigma: 0.182026
## lambda (gene 1): 0.570664
## epsilon (gene 1): 0.222658
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 289.995
## delta (gene 1): 12.421
## s (cell 1): 0.998393
## nu (cell 1): 1.04507
## theta (batch 1): 0.00213274
## betas:    1.6460  -0.2891  -0.0556  -0.1254   0.3000   1.2222   0.7116   0.8171   1.8403   0.2693   (
##
## sigma: 0.185321
## lambda (gene 1): 1.45228
## epsilon (gene 1): 0.103923
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.572
## delta (gene 1): 10.5927
## s (cell 1): 0.980519
## nu (cell 1): 1.00707
## theta (batch 1): 0.00126588
## betas:    1.6718  -0.2153   0.1571  -0.3834   0.9222   0.3813   1.3101   0.4484   1.6433   0.4471  -(
##
## sigma: 0.181347
## lambda (gene 1): 0.669051
## epsilon (gene 1): -0.0704644
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

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## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 35360 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.207
## delta (gene 1): 13.5115
## s (cell 1): 1.19704
## nu (cell 1): 1.16616
## theta (batch 1): 0.00252381
## betas:    1.6564  -0.2741  -0.3458  -0.2577   0.6258   0.5766   1.0418   0.7938   1.5692   0.5906   (
##
## sigma: 0.176106
## lambda (gene 1): 0.35316
## epsilon (gene 1): 0.173719
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 35400 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 293.697
## delta (gene 1): 13.4389
## s (cell 1): 0.974982
## nu (cell 1): 1.03332
## theta (batch 1): 0.00469088
## betas:    1.9970  -0.2352  -0.5268  -0.5829   1.0121   0.3685   1.0094   0.5908   1.2422   0.8405   -(
##
## sigma: 0.176326
## lambda (gene 1): 1.20502
## epsilon (gene 1): 0.144755
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 35440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 288.181
## delta (gene 1): 13.4675
## s (cell 1): 1.23975
## nu (cell 1): 1.10022
## theta (batch 1): 0.0611332
## betas:    1.4338  -0.1382  -0.3557   0.1707   0.9797   0.8691   0.7005   0.9758   1.3725   0.3064   -(
##
```

```
## sigma: 0.185269
## lambda (gene 1): 0.841909
## epsilon (gene 1): 0.178395
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 144.711
## delta (gene 1): 15.8979
## s (cell 1): 1.17723
## nu (cell 1): 1.11193
## theta (batch 1): 0.0245501
## betas:    1.6810  -0.2844   0.5145  -0.1023  -0.0738   1.2993   0.6346   0.8586   1.6478   0.6517  -(
##
## sigma: 0.182087
## lambda (gene 1): 0.422066
## epsilon (gene 1): 0.354321
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35520 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 310.203
## delta (gene 1): 12.7838
## s (cell 1): 1.20991
## nu (cell 1): 1.04279
## theta (batch 1): 0.016847
## betas:    1.4142  -0.1972   0.1373   0.5037   0.3403   0.9556   0.7095   1.2020   1.1028   0.9168  -(
##
## sigma: 0.174431
## lambda (gene 1): 0.462745
## epsilon (gene 1): 0.106899
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35560 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 155.803
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## delta (gene 1): 13.0565
## s (cell 1): 1.14633
## nu (cell 1): 1.05865
## theta (batch 1): 0.00618769
## betas:     1.9021  -0.2091   0.2505   0.4078   0.5172   0.2260   1.2748   0.4675   1.3919   0.5302  -(
##
## sigma: 0.172434
## lambda (gene 1): 0.926692
## epsilon (gene 1): 0.139976
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35600 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 106.716
## delta (gene 1): 18.6056
## s (cell 1): 0.951116
## nu (cell 1): 1.0832
## theta (batch 1): 0.0151147
## betas:     1.5079  -0.1657  -0.0823   0.2066   0.7252   0.6658   0.8689   0.9168   1.2826   0.6507  -(
##
## sigma: 0.173758
## lambda (gene 1): 0.404299
## epsilon (gene 1): 0.50714
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35640 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.268
## delta (gene 1): 10.7297
## s (cell 1): 1.984
## nu (cell 1): 1.10499
## theta (batch 1): 0.04757
## betas:     1.2914  -0.1360  -0.7004  -0.1064   0.6215   1.0593   0.6498   1.3134   0.9168   0.8805  -(
##
## sigma: 0.183238
## lambda (gene 1): 1.7769
## epsilon (gene 1): -0.0450506
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 35680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 282.237
## delta (gene 1): 14.4129
## s (cell 1): 1.04762
## nu (cell 1): 0.976592
## theta (batch 1): 0.0279838
## betas:    1.6738  -0.2253   0.3460  -1.1397   0.9266   1.0141   0.5149   0.9231   1.5255   0.4708  -(
##
## sigma: 0.173172
## lambda (gene 1): 0.678447
## epsilon (gene 1): 0.231915
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 35720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.827
## delta (gene 1): 12.8346
## s (cell 1): 1.28443
## nu (cell 1): 1.2236
## theta (batch 1): 0.0576332
## betas:    1.0293  -0.0386  -0.2482   0.1823   0.7407   1.3186   0.6317   1.1673   1.0835   0.6353  -(
##
## sigma: 0.173436
## lambda (gene 1): 1.46291
## epsilon (gene 1): 0.138917
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 35760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 135.97
## delta (gene 1): 10.6749
## s (cell 1): 1.04317
## nu (cell 1): 1.07359
## theta (batch 1): 0.0511323
## betas:    1.1349  -0.1319  -0.6355   0.5409   0.5998   0.9599   1.1978   0.6826   1.5261   0.7353  -(
##
## sigma: 0.173741
## lambda (gene 1): 1.61849
```

```
## epsilon (gene 1): -0.0862911
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35800 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 261.995
## delta (gene 1): 12.6594
## s (cell 1): 1.02668
## nu (cell 1): 1.05408
## theta (batch 1): 0.0244114
## betas:    1.6253  -0.2335  -0.4607   0.2065   0.6198   0.4041   1.1166   0.7946   1.3656   0.8741  -(
##
## sigma: 0.184399
## lambda (gene 1): 0.319305
## epsilon (gene 1): 0.0922733
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.253
## delta (gene 1): 18.1802
## s (cell 1): 0.86798
## nu (cell 1): 1.07925
## theta (batch 1): 0.0433584
## betas:    1.4037  -0.2127  -0.2114  -0.5330   1.0687   0.5394   0.9742   1.0925   1.1542   1.0176  -(
##
## sigma: 0.172753
## lambda (gene 1): 1.01548
## epsilon (gene 1): 0.463661
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 35880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.47
## delta (gene 1): 16.7241
## s (cell 1): 1.18875
```

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## nu (cell 1): 1.15515
## theta (batch 1): 0.0483189
## betas:    1.8625  -0.2189  -0.2328   0.4567  -0.0296   0.8987   0.8021   0.7120   1.4634   0.2672
##
## sigma: 0.181717
## lambda (gene 1): 0.464894
## epsilon (gene 1): 0.381266
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 35920 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.664
## delta (gene 1): 15.0442
## s (cell 1): 1.56971
## nu (cell 1): 1.1137
## theta (batch 1): 0.0141258
## betas:    1.0147  -0.1586   0.0054   0.1820   0.6412   1.2216   1.1405   0.7106   1.7769   0.6040  -
##
## sigma: 0.187748
## lambda (gene 1): 0.667816
## epsilon (gene 1): 0.286021
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
## Iteration 35960 out of 40000 has been completed.
## -----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 166.919
## delta (gene 1): 10.8934
## s (cell 1): 0.89502
## nu (cell 1): 1.14616
## theta (batch 1): 0.0225412
## betas:    1.5405  -0.2261   0.7452  -0.0032   0.3238   1.3413   0.3625   1.2996   1.2158   0.7687  -
##
## sigma: 0.181103
## lambda (gene 1): 2.13957
## epsilon (gene 1): -0.0307393
## -----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------------
```

```
## Iteration 36000 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 169.198
## delta (gene 1): 11.6708
## s (cell 1): 1.09379
## nu (cell 1): 1.16465
## theta (batch 1): 0.00954078
## betas:    1.2015  -0.3082  -0.0285   0.2933   0.2913   1.1336   0.8406   1.1414   1.7572   0.8170  (
##
## sigma: 0.180212
## lambda (gene 1): 2.7336
## epsilon (gene 1): 0.0154204
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 36040 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 177.237
## delta (gene 1): 13.1658
## s (cell 1): 1.10483
## nu (cell 1): 1.1511
## theta (batch 1): 0.0160549
## betas:    1.7742  -0.1969  -0.3117   0.0356   0.6153   0.5382   0.8921   0.7272   1.4341   0.4957  -(
##
## sigma: 0.180561
## lambda (gene 1): 0.352313
## epsilon (gene 1): 0.151101
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 36080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 269.88
## delta (gene 1): 13.3336
## s (cell 1): 0.996405
## nu (cell 1): 1.1092
## theta (batch 1): 0.0171305
## betas:    1.0111  -0.1677   0.1502   0.2147   0.6041   0.7373   1.2143   1.0161   1.3760   0.9253  -(
##
## sigma: 0.185909
## lambda (gene 1): 2.0434
## epsilon (gene 1): 0.143673
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 36120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 307.879
## delta (gene 1): 13.6483
## s (cell 1): 1.14456
## nu (cell 1): 1.12837
## theta (batch 1): 0.0152645
## betas:    1.0747  -0.2155  -0.5884   0.9190   0.2027   1.3103   0.7971   1.2716   1.3012   1.1046  -(
##
## sigma: 0.171752
## lambda (gene 1): 0.365202
## epsilon (gene 1): 0.165466
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 36160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.879
## delta (gene 1): 16.1207
## s (cell 1): 1.15541
## nu (cell 1): 1.07028
## theta (batch 1): 0.0112433
## betas:    1.2358  -0.1353   0.0210   0.5904   0.4751   1.0526   0.9567   0.8836   1.3435   0.7287  -(
##
## sigma: 0.184687
## lambda (gene 1): 0.701208
## epsilon (gene 1): 0.354272
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 36200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.087
## delta (gene 1): 15.1717
## s (cell 1): 1.20467
## nu (cell 1): 1.03229
## theta (batch 1): 0.011579
```

```
## betas:    1.1931  -0.1641   0.1425   0.1000   0.8753   0.6887   1.1512   0.7510   1.6963   0.4268  -(
##
## sigma: 0.184831
## lambda (gene 1): 1.05122
## epsilon (gene 1): 0.282155
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 36240 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 356.144
## delta (gene 1): 18.4971
## s (cell 1): 1.10486
## nu (cell 1): 1.08903
## theta (batch 1): 0.00401809
## betas:    1.2128  -0.1695   0.1985  -0.7036   1.1254   1.2188   0.3605   1.4287   1.2679   0.6837  -(
##
## sigma: 0.171136
## lambda (gene 1): 1.41928
## epsilon (gene 1): 0.502362
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 36280 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 248.429
## delta (gene 1): 13.53
## s (cell 1): 1.07507
## nu (cell 1): 1.08288
## theta (batch 1): 0.00259229
## betas:    1.4355  -0.2546  -0.4835  -0.4877   0.6062   0.9544   0.6952   1.3369   1.1026   1.1503  -(
##
## sigma: 0.182705
## lambda (gene 1): 0.846984
## epsilon (gene 1): 0.166187
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 36320 out of 40000 has been completed.
## ------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.854
## delta (gene 1): 14.1015
## s (cell 1): 0.936097
## nu (cell 1): 1.06503
## theta (batch 1): 0.0100688
## betas:    1.1682  -0.0517  -0.5651   0.3599   0.1805   1.5576   0.6020   1.0586   1.1306   0.5932  -(
##
## sigma: 0.170881
## lambda (gene 1): 1.36625
## epsilon (gene 1): 0.236402
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 36360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 153.792
## delta (gene 1): 12.6559
## s (cell 1): 0.96484
## nu (cell 1): 1.05108
## theta (batch 1): 0.0268623
## betas:    1.2760  -0.1054  -0.3639   0.1608   0.7067   0.9571   0.7882   1.0761   1.1528   0.5521  -(
##
## sigma: 0.176309
## lambda (gene 1): 1.7366
## epsilon (gene 1): 0.1106
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 36400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.4
## delta (gene 1): 15.0623
## s (cell 1): 1.2692
## nu (cell 1): 1.09157
## theta (batch 1): 0.0168394
## betas:    1.4471  -0.1340   0.0872  -0.1210   0.6325   0.8429   0.9965   0.7466   1.2344   0.7593  -(
##
## sigma: 0.180248
## lambda (gene 1): 1.08628
## epsilon (gene 1): 0.278492
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 36440 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 255.168
## delta (gene 1): 21.0564
## s (cell 1): 0.997104
## nu (cell 1): 1.02852
## theta (batch 1): 0.0240023
## betas:    1.0085  -0.1023   0.1086   0.0047   1.2136   0.9665   1.0816   0.7121   1.7277   0.3686  -(
##
## sigma: 0.176028
## lambda (gene 1): 0.195661
## epsilon (gene 1): 0.62206
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 36480 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 182.716
## delta (gene 1): 13.6418
## s (cell 1): 1.10418
## nu (cell 1): 1.04706
## theta (batch 1): 0.00935659
## betas:    1.8547  -0.2027   0.2233  -0.5570   0.9099   0.5013   1.0300   0.5470   1.5025   0.3424  -(
##
## sigma: 0.187926
## lambda (gene 1): 0.720855
## epsilon (gene 1): 0.198236
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 36520 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.691
## delta (gene 1): 17.2245
## s (cell 1): 1.00062
## nu (cell 1): 1.13596
## theta (batch 1): 0.0480096
## betas:    1.3600  -0.2971   0.2685   0.0512   0.4477   0.9353   0.7247   1.3634   1.3314   1.0088  -(
##
```

```
## sigma: 0.173433
## lambda (gene 1): 1.18366
## epsilon (gene 1): 0.422525
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 36560 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 212.585
## delta (gene 1): 10.6275
## s (cell 1): 1.06832
## nu (cell 1): 1.10909
## theta (batch 1): 0.0457975
## betas:    1.1423  -0.1855  -0.1840   0.2921   0.8040   0.9728   0.8302   1.3273   1.0040   1.2043  -(
##
## sigma: 0.179269
## lambda (gene 1): 2.19286
## epsilon (gene 1): -0.0868343
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 36600 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 236.999
## delta (gene 1): 13.7421
## s (cell 1): 0.943911
## nu (cell 1): 1.07394
## theta (batch 1): 0.0736604
## betas:    1.3731  -0.1466  -0.2950   0.7941   0.4256   1.0125   0.8124   1.0209   1.2558   0.5849  -(
##
## sigma: 0.171412
## lambda (gene 1): 1.47799
## epsilon (gene 1): 0.215533
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 36640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 105.968
```

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## delta (gene 1): 18.6667
## s (cell 1): 1.21361
## nu (cell 1): 1.11168
## theta (batch 1): 0.00898393
## betas:    0.9620  -0.2813   0.6295  -0.0224   0.9434   0.6450   1.2208   1.1548   1.7285   0.9355
##
## sigma: 0.171
## lambda (gene 1): 0.390365
## epsilon (gene 1): 0.499969
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 36680 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 275.272
## delta (gene 1): 10.7212
## s (cell 1): 1.0217
## nu (cell 1): 0.999228
## theta (batch 1): 0.0347539
## betas:    1.5579  -0.2829   0.3432  -0.2781   0.3117   0.9227   0.8068   1.1640   1.1889   1.0602  -
##
## sigma: 0.182707
## lambda (gene 1): 2.49547
## epsilon (gene 1): -0.0892745
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 36720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 169.572
## delta (gene 1): 13.5818
## s (cell 1): 0.956261
## nu (cell 1): 1.0824
## theta (batch 1): 0.0542837
## betas:    0.2940  -0.0469   0.4626   0.4018   1.0847   1.6597   1.0856   0.9915   1.8271   0.4743  -
##
## sigma: 0.172319
## lambda (gene 1): 1.96517
## epsilon (gene 1): 0.19014
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 36760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 393.75
## delta (gene 1): 13.3194
## s (cell 1): 1.06619
## nu (cell 1): 1.06708
## theta (batch 1): 0.0368835
## betas:    1.5320  -0.1744  -0.1718   0.2615   0.0951   1.1249   0.5718   1.1668   1.0779   0.6689  -(
##
## sigma: 0.171109
## lambda (gene 1): 0.725769
## epsilon (gene 1): 0.165283
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 36800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 155.775
## delta (gene 1): 15.7316
## s (cell 1): 1.38764
## nu (cell 1): 1.14809
## theta (batch 1): 0.0225751
## betas:    1.1951  -0.2503  -0.0897  -0.0757   0.3821   1.3692   0.4833   1.4494   1.3474   0.9724  -(
##
## sigma: 0.178059
## lambda (gene 1): 1.40251
## epsilon (gene 1): 0.330465
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 36840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 173.984
## delta (gene 1): 15.3702
## s (cell 1): 1.33452
## nu (cell 1): 1.05576
## theta (batch 1): 0.047824
## betas:    1.0168  -0.0928   0.0033  -0.4814   0.8247   1.1540   0.8927   1.0190   1.4057   0.5269  -(
##
## sigma: 0.182662
## lambda (gene 1): 1.53475
```

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## epsilon (gene 1): 0.316867
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 36880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 373.326
## delta (gene 1): 12.1302
## s (cell 1): 0.715288
## nu (cell 1): 0.960057
## theta (batch 1): 0.0309645
## betas:    1.5855  -0.2002  -0.2022   0.4876   0.2327   0.9581   1.0010   0.6268   1.5800   0.5608  -(
##
## sigma: 0.177643
## lambda (gene 1): 1.20372
## epsilon (gene 1): 0.0475434
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 36920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 424.676
## delta (gene 1): 13.5998
## s (cell 1): 1.01255
## nu (cell 1): 1.04604
## theta (batch 1): 0.0119053
## betas:    1.2576  -0.1226   0.0596   0.2123   0.5587   0.8662   1.0637   0.8910   1.2419   0.7399  -(
##
## sigma: 0.178171
## lambda (gene 1): 1.65774
## epsilon (gene 1): 0.191536
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 36960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 248.44
## delta (gene 1): 14.4776
## s (cell 1): 1.04955
```

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## nu (cell 1): 1.13933
## theta (batch 1): 0.00754705
## betas:    1.2282  -0.2110   0.7762   0.1537   0.4910   1.0433   0.8975   1.0422   1.5113   0.6967  -(
##
## sigma: 0.173411
## lambda (gene 1): 0.901522
## epsilon (gene 1): 0.259001
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 37000 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.852
## delta (gene 1): 10.8362
## s (cell 1): 1.13512
## nu (cell 1): 1.1546
## theta (batch 1): 0.00348603
## betas:    1.5762  -0.1951  -0.3841   0.2670   0.2860   0.9314   0.6749   1.1817   0.8981   1.1785  -(
##
## sigma: 0.177483
## lambda (gene 1): 0.893836
## epsilon (gene 1): -0.055267
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 37040 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 369.053
## delta (gene 1): 11.7345
## s (cell 1): 1.04205
## nu (cell 1): 1.0475
## theta (batch 1): 0.00695481
## betas:    1.2062  -0.1133  -0.1683  -0.1298   0.9696   0.7282   1.2629   0.6797   1.4173   0.6276  -(
##
## sigma: 0.18142
## lambda (gene 1): 1.29472
## epsilon (gene 1): 0.030647
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
```

```
## Iteration 37080 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 227.955
## delta (gene 1): 14.2675
## s (cell 1): 1.15592
## nu (cell 1): 1.11639
## theta (batch 1): 0.00669843
## betas:    1.1411  -0.1576   0.5326   0.0901   0.8561   0.8714   0.9211   1.1840   1.1713   0.8386  -(
##
## sigma: 0.171375
## lambda (gene 1): 0.569316
## epsilon (gene 1): 0.223507
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 37120 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 166.59
## delta (gene 1): 13.6065
## s (cell 1): 0.959344
## nu (cell 1): 1.04551
## theta (batch 1): 0.0103677
## betas:    0.9716  -0.1331   0.6066   0.2956   0.5153   1.0849   1.0516   0.9017   1.6454   0.5641  -(
##
## sigma: 0.171382
## lambda (gene 1): 1.69054
## epsilon (gene 1): 0.18843
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 37160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 287.077
## delta (gene 1): 13.8647
## s (cell 1): 0.97307
## nu (cell 1): 1.03344
## theta (batch 1): 0.00702458
## betas:    1.2676  -0.1843  -0.1454   0.2081   0.3502   1.1176   0.8894   0.9519   1.5816   0.3835   (
##
## sigma: 0.173763
## lambda (gene 1): 2.53027
## epsilon (gene 1): 0.215761
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 37200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.808
## delta (gene 1): 15.565
## s (cell 1): 1.31392
## nu (cell 1): 1.06603
## theta (batch 1): 0.018932
## betas:    1.5255  -0.1140   0.0598   0.2890   0.2014   0.8811   1.0383   0.6430   1.2696   0.6009  -0
##
## sigma: 0.178409
## lambda (gene 1): 1.30046
## epsilon (gene 1): 0.307456
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 37240 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 320.961
## delta (gene 1): 11.374
## s (cell 1): 1.10614
## nu (cell 1): 1.13668
## theta (batch 1): 0.0292185
## betas:    0.6210  -0.1296   0.1630   0.8527   0.6267   1.5444   0.8857   1.3381   1.2502   1.2523  -0
##
## sigma: 0.178029
## lambda (gene 1): 0.716944
## epsilon (gene 1): -0.0135592
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 37280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.342
## delta (gene 1): 14.2303
## s (cell 1): 1.35482
## nu (cell 1): 1.08105
## theta (batch 1): 0.0214012
```

```
## betas:     1.3552  -0.0490   0.0740   0.3691   0.8637   0.6409   1.1799   0.5295   1.3283   0.4432  -
##
## sigma: 0.183124
## lambda (gene 1): 0.97964
## epsilon (gene 1): 0.235393
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 37320 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 207.213
## delta (gene 1): 15.5045
## s (cell 1): 0.865895
## nu (cell 1): 1.11588
## theta (batch 1): 0.0168088
## betas:     1.3298  -0.1567   0.1966  -0.0731   0.7182   0.7269   1.2182   0.6920   1.4256   0.6188  -
##
## sigma: 0.183904
## lambda (gene 1): 2.13833
## epsilon (gene 1): 0.297345
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 37360 out of 40000 has been completed.
## ------------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 152.097
## delta (gene 1): 18.1041
## s (cell 1): 0.990414
## nu (cell 1): 1.16004
## theta (batch 1): 0.0251971
## betas:     1.3160  -0.1683   0.1210  -0.0791   1.1719   0.6159   0.9244   1.1810   1.1181   0.7151  -
##
## sigma: 0.176841
## lambda (gene 1): 1.45191
## epsilon (gene 1): 0.4691
## ------------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------------
## Iteration 37400 out of 40000 has been completed.
## ------------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 151.313
## delta (gene 1): 18.7324
## s (cell 1): 0.937574
## nu (cell 1): 1.06171
## theta (batch 1): 0.020498
## betas:    1.0284  -0.1996  -0.4040   0.6609   0.2927   0.9039   1.3691   0.8555   1.4979   1.0864  -(
##
## sigma: 0.184528
## lambda (gene 1): 1.42498
## epsilon (gene 1): 0.51801
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 37440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 235.482
## delta (gene 1): 12.3841
## s (cell 1): 1.36257
## nu (cell 1): 1.18173
## theta (batch 1): 0.0208409
## betas:    1.9726  -0.2500  -0.0013  -0.4172   0.2582   0.6769   0.9751   0.5747   1.3973   0.7144  -(
##
## sigma: 0.184257
## lambda (gene 1): 1.06838
## epsilon (gene 1): 0.0917312
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 37480 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 196.634
## delta (gene 1): 16.6681
## s (cell 1): 0.940322
## nu (cell 1): 1.10549
## theta (batch 1): 0.0204203
## betas:    1.4410  -0.1391   0.7213  -0.4036   0.8390   1.2859   0.4286   1.0596   1.4251   0.1962  -(
##
## sigma: 0.173115
## lambda (gene 1): 1.27449
## epsilon (gene 1): 0.381804
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 37520 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 303.885
## delta (gene 1): 11.5733
## s (cell 1): 0.908027
## nu (cell 1): 1.08623
## theta (batch 1): 0.0345304
## betas:    1.5003  -0.2317   0.3745  -0.7306   0.1268   1.4129   0.8208   0.6618   1.7448   0.5964  -(
##
## sigma: 0.177327
## lambda (gene 1): 1.61136
## epsilon (gene 1): 0.00629418
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 37560 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 282.554
## delta (gene 1): 12.2146
## s (cell 1): 0.930481
## nu (cell 1): 0.998796
## theta (batch 1): 0.00907751
## betas:    1.1604  -0.1758  -0.2574  -0.3301   0.7587   1.2063   0.6087   1.2798   1.4254   0.4325   (
##
## sigma: 0.18634
## lambda (gene 1): 1.76544
## epsilon (gene 1): 0.0919627
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 37600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 243.176
## delta (gene 1): 11.9043
## s (cell 1): 0.988295
## nu (cell 1): 1.05536
## theta (batch 1): 0.0111936
## betas:    1.1966  -0.0407   0.0918   0.6185   0.4312   1.2885   0.8739   0.7512   1.2352   0.6099  -(
##
```

```
## sigma: 0.17811
## lambda (gene 1): 0.466655
## epsilon (gene 1): 0.0420895
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 37640 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 279.118
## delta (gene 1): 12.8608
## s (cell 1): 1.16735
## nu (cell 1): 1.11526
## theta (batch 1): 0.0274046
## betas:    1.5179  -0.1546   0.0905  -0.5841   1.0601   0.8030   0.8889   0.8124   1.3538   0.4775  -(
##
## sigma: 0.175183
## lambda (gene 1): 0.421162
## epsilon (gene 1): 0.129784
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 37680 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 221.969
## delta (gene 1): 16.5351
## s (cell 1): 1.1021
## nu (cell 1): 1.04767
## theta (batch 1): 0.0243193
## betas:    1.5704  -0.1252  -0.0461   0.0283   0.5192   1.0499   0.6983   0.8487   1.3022   0.2797  -(
##
## sigma: 0.16977
## lambda (gene 1): 1.37568
## epsilon (gene 1): 0.368552
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 37720 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.826
```

```
## delta (gene 1): 19.5799
## s (cell 1): 1.31125
## nu (cell 1): 1.10719
## theta (batch 1): 0.0511213
## betas:    0.8887  -0.1107   0.6304  -0.5218   0.8028   1.1172   1.0721   0.9696   1.5004   0.6046  -(
##
## sigma: 0.179845
## lambda (gene 1): 1.00074
## epsilon (gene 1): 0.532706
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 37760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 263.494
## delta (gene 1): 12.2681
## s (cell 1): 0.963646
## nu (cell 1): 1.08743
## theta (batch 1): 0.0180704
## betas:    1.4178  -0.1880   0.1112  -0.3975   0.4953   0.9488   1.1294   0.7752   1.3591   0.8257  -(
##
## sigma: 0.184899
## lambda (gene 1): 1.19977
## epsilon (gene 1): 0.0695985
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 37800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.146
## delta (gene 1): 15.3124
## s (cell 1): 1.03585
## nu (cell 1): 1.01069
## theta (batch 1): 0.0136607
## betas:    1.6002  -0.2186   0.4213  -0.3376   0.8025   0.5527   1.0257   0.7720   1.4795   0.6157  -(
##
## sigma: 0.175997
## lambda (gene 1): 0.428475
## epsilon (gene 1): 0.302406
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 37840 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 276.621
## delta (gene 1): 12.7507
## s (cell 1): 0.868943
## nu (cell 1): 1.17405
## theta (batch 1): 0.0362614
## betas:    0.9023  -0.1369   0.3005   0.3484   0.6477   1.5656   0.6736   1.2387   1.3989   0.7072  -(
##
## sigma: 0.184151
## lambda (gene 1): 0.80042
## epsilon (gene 1): 0.107328
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 37880 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 249.35
## delta (gene 1): 13.8599
## s (cell 1): 0.809536
## nu (cell 1): 0.977875
## theta (batch 1): 0.0185304
## betas:    1.1486  -0.1564  -0.4245   0.0677   1.1907   0.8686   1.0092   0.8676   1.5633   0.6894  -(
##
## sigma: 0.181886
## lambda (gene 1): 2.35473
## epsilon (gene 1): 0.205601
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 37920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 253.485
## delta (gene 1): 19.3219
## s (cell 1): 1.40856
## nu (cell 1): 1.11326
## theta (batch 1): 0.0261635
## betas:    1.0636  -0.0677   0.1222  -0.0981   0.9626   0.6496   1.3076   0.5839   1.6539   0.1981  -(
##
## sigma: 0.17158
## lambda (gene 1): 1.22927
```

```
## epsilon (gene 1): 0.541817
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 37960 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 134.692
## delta (gene 1): 18.3405
## s (cell 1): 1.47553
## nu (cell 1): 0.977001
## theta (batch 1): 0.0767922
## betas:    1.3161  -0.2247  -0.7037  -0.0496  -0.0336   1.5051   0.5429   1.2335   1.4465   0.6630  -(
##
## sigma: 0.194609
## lambda (gene 1): 0.318242
## epsilon (gene 1): 0.495255
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 38000 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.275
## delta (gene 1): 13.0896
## s (cell 1): 1.84832
## nu (cell 1): 1.18441
## theta (batch 1): 0.0313524
## betas:    1.2158  -0.1352  -0.9473   0.5297   0.9533   0.5473   0.9750   1.1925   0.9496   1.0903  -(
##
## sigma: 0.178209
## lambda (gene 1): 1.93436
## epsilon (gene 1): 0.141371
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 38040 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 267.8
## delta (gene 1): 16.1258
## s (cell 1): 1.40225
```

```
## nu (cell 1): 1.05996
## theta (batch 1): 0.0200945
## betas:    1.9208  -0.2988  -0.3803  -0.4761   0.2852   0.9295   0.5722   1.0954   1.1257   0.9882  -(
##
## sigma: 0.164797
## lambda (gene 1): 0.933643
## epsilon (gene 1): 0.339605
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 38080 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.852
## delta (gene 1): 12.9396
## s (cell 1): 1.11918
## nu (cell 1): 1.05548
## theta (batch 1): 0.0171004
## betas:    0.6591  -0.1472   0.5373   0.2504   0.7142   1.1910   1.3588   0.9000   1.5946   1.1530  -(
##
## sigma: 0.182678
## lambda (gene 1): 2.71061
## epsilon (gene 1): 0.118868
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
## Iteration 38120 out of 40000 has been completed.
## ----------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 181.283
## delta (gene 1): 12.3744
## s (cell 1): 0.988212
## nu (cell 1): 1.11001
## theta (batch 1): 0.0257648
## betas:    1.1836  -0.1853   0.4107  -0.1882   0.2865   1.4426   0.8150   0.8890   1.7044   0.4821  -(
##
## sigma: 0.187412
## lambda (gene 1): 0.384347
## epsilon (gene 1): 0.0665
## ----------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ----------------------------------------------------------
```

```
## Iteration 38160 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 114.181
## delta (gene 1): 17.1105
## s (cell 1): 0.937306
## nu (cell 1): 1.12647
## theta (batch 1): 0.040462
## betas:    1.5120  -0.1888   0.5894  -0.5738   1.1104   0.5092   1.0505   1.0002   1.0434   1.0469  -(
##
## sigma: 0.172439
## lambda (gene 1): 0.468775
## epsilon (gene 1): 0.405192
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 38200 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 222.324
## delta (gene 1): 14.6272
## s (cell 1): 0.930855
## nu (cell 1): 1.05698
## theta (batch 1): 0.0740294
## betas:    2.1172  -0.2944   0.2325  -0.9229   0.2870   1.2089   0.4021   0.7027   1.7102   0.1676   (
##
## sigma: 0.193034
## lambda (gene 1): 0.654068
## epsilon (gene 1): 0.270801
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 38240 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 240.051
## delta (gene 1): 15.1596
## s (cell 1): 1.25834
## nu (cell 1): 1.07293
## theta (batch 1): 0.0482246
## betas:    1.6411  -0.2174  -0.0903   0.2609   0.0254   1.2027   0.5985   0.9703   1.4021   0.5575  -(
##
## sigma: 0.168451
## lambda (gene 1): 2.5007
## epsilon (gene 1): 0.316694
## --------------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 38280 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 220.107
## delta (gene 1): 15.5546
## s (cell 1): 1.03831
## nu (cell 1): 1.07602
## theta (batch 1): 0.0272047
## betas:    1.9994  -0.2571  -0.2804   0.1473  -0.2479   1.3250   0.3305   0.8076   1.5137   0.4367  -0
##
## sigma: 0.182404
## lambda (gene 1): 1.37083
## epsilon (gene 1): 0.310187
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 38320 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.203
## delta (gene 1): 13.8009
## s (cell 1): 1.09201
## nu (cell 1): 1.0481
## theta (batch 1): 0.00605818
## betas:    1.4403  -0.1725   0.5190   0.2189   0.5065   0.7267   0.9494   0.9397   1.2435   0.6828  -0
##
## sigma: 0.174422
## lambda (gene 1): 0.738826
## epsilon (gene 1): 0.199866
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 38360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 326.983
## delta (gene 1): 10.6246
## s (cell 1): 1.12471
## nu (cell 1): 1.03904
## theta (batch 1): 0.00371123
```

```
## betas:     1.5839  -0.2485   0.4078   0.2605   0.1706   0.5980   1.2547   0.6261   1.6225   0.5912  -(
##
## sigma: 0.187234
## lambda (gene 1): 1.08485
## epsilon (gene 1): -0.0516843
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 38400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 231.151
## delta (gene 1): 16.5898
## s (cell 1): 1.04869
## nu (cell 1): 1.13067
## theta (batch 1): 0.00741464
## betas:     1.2515  -0.1819   0.1593   0.0032   0.7309   0.9383   1.0750   0.7864   1.6386   0.4140  (
##
## sigma: 0.170563
## lambda (gene 1): 1.03523
## epsilon (gene 1): 0.398244
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 38440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 159.934
## delta (gene 1): 14.6567
## s (cell 1): 1.10652
## nu (cell 1): 1.03275
## theta (batch 1): 0.0116702
## betas:     1.6538  -0.1770  -0.1646  -0.0786   0.1963   1.2126   0.5744   0.8239   1.4051   0.5626  -(
##
## sigma: 0.181131
## lambda (gene 1): 1.89745
## epsilon (gene 1): 0.260547
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 38480 out of 40000 has been completed.
## -------------------------------------------------------
```

```
## Current draws for selected parameters are displayed below.
## mu (gene 1): 197.869
## delta (gene 1): 13.4886
## s (cell 1): 1.04216
## nu (cell 1): 1.03821
## theta (batch 1): 0.00740685
## betas:    0.9796  -0.1213   0.2389  -0.2952   0.4278   1.5778   0.8165   0.9423   1.5818   0.5888  -(
##
## sigma: 0.176351
## lambda (gene 1): 0.940845
## epsilon (gene 1): 0.169839
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 38520 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.415
## delta (gene 1): 12.4232
## s (cell 1): 1.12166
## nu (cell 1): 1.1037
## theta (batch 1): 0.00693249
## betas:    1.3216  -0.1691  -0.0869   0.4487   0.5330   0.9886   0.8274   1.0861   1.2000   0.8338  -(
##
## sigma: 0.170637
## lambda (gene 1): 1.60809
## epsilon (gene 1): 0.092586
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ------------------------------------------------------
## Iteration 38560 out of 40000 has been completed.
## ------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 174.274
## delta (gene 1): 12.6089
## s (cell 1): 0.977128
## nu (cell 1): 1.15316
## theta (batch 1): 0.0089043
## betas:    0.8961  -0.1201   0.2188  -0.2060   1.0132   1.0312   1.0120   1.0575   1.3635   0.8807  -(
##
## sigma: 0.174183
## lambda (gene 1): 0.779418
## epsilon (gene 1): 0.0879321
## ------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 38600 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.861
## delta (gene 1): 11.2816
## s (cell 1): 1.12293
## nu (cell 1): 1.09565
## theta (batch 1): 0.00237536
## betas:    1.3251  -0.1539  -0.4222  -0.2894   0.4067   1.2329   1.0043   0.8121   1.2482   0.9809  -(
##
## sigma: 0.18015
## lambda (gene 1): 1.41875
## epsilon (gene 1): -0.0188217
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 38640 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 215.611
## delta (gene 1): 14.0287
## s (cell 1): 1.06303
## nu (cell 1): 1.07117
## theta (batch 1): 0.00821237
## betas:    0.6815  -0.0659  -0.3136   0.1946   0.7946   1.5103   1.0230   0.8573   1.7834   0.3068  -(
##
## sigma: 0.185431
## lambda (gene 1): 0.587367
## epsilon (gene 1): 0.239841
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 38680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 146.475
## delta (gene 1): 18.7778
## s (cell 1): 1.25748
## nu (cell 1): 1.06881
## theta (batch 1): 0.0134103
## betas:    1.2319  -0.1871  -0.1215  -0.0739   0.8634   0.9180   0.8169   1.1100   1.4205   0.6703  -(
##
```

```
## sigma: 0.185552
## lambda (gene 1): 0.956787
## epsilon (gene 1): 0.513918
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 38720 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.967
## delta (gene 1): 15.5391
## s (cell 1): 1.04014
## nu (cell 1): 1.04112
## theta (batch 1): 0.0218452
## betas:    1.1531  -0.1333  -0.3098   0.5181   0.5039   0.9652   1.1152   0.6688   1.7401   0.2656  -0
##
## sigma: 0.187449
## lambda (gene 1): 0.504656
## epsilon (gene 1): 0.324293
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 38760 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.112
## delta (gene 1): 14.0066
## s (cell 1): 1.04409
## nu (cell 1): 1.11395
## theta (batch 1): 0.0146332
## betas:    1.1759  -0.1511  -0.6252   0.0366   0.9868   0.8405   1.0213   0.9321   1.4420   0.5852  -0
##
## sigma: 0.172182
## lambda (gene 1): 1.27434
## epsilon (gene 1): 0.203998
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 38800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 192.355
```

```
## delta (gene 1): 13.2081
## s (cell 1): 0.964213
## nu (cell 1): 1.12254
## theta (batch 1): 0.0460984
## betas:    1.6584  -0.1458  -0.8472  -0.1565   0.5726   0.8947   0.7580   0.8755   1.1016   0.6785  -0
##
## sigma: 0.182981
## lambda (gene 1): 1.25849
## epsilon (gene 1): 0.127957
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 38840 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 239.164
## delta (gene 1): 14.6778
## s (cell 1): 1.18414
## nu (cell 1): 1.04936
## theta (batch 1): 0.0169592
## betas:    1.5855  -0.2291   0.3120  -0.3223  -0.4260   1.8149   0.2465   1.0758   1.5839   0.3159
##
## sigma: 0.18518
## lambda (gene 1): 0.92805
## epsilon (gene 1): 0.263063
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 38880 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.75
## delta (gene 1): 12.9834
## s (cell 1): 0.933161
## nu (cell 1): 1.0611
## theta (batch 1): 0.0169481
## betas:    1.1385  -0.1145   0.0119  -0.3567   1.0125   0.9790   0.8527   1.0679   1.2491   0.7296  -0
##
## sigma: 0.177735
## lambda (gene 1): 0.336117
## epsilon (gene 1): 0.153058
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

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## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 38920 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 154.124
## delta (gene 1): 16.0431
## s (cell 1): 1.22403
## nu (cell 1): 1.1885
## theta (batch 1): 0.00411231
## betas:    0.8866  -0.1322  -0.0530   0.4860   0.8928   1.0016   1.0104   1.1007   1.4671   0.6322  -(
##
## sigma: 0.18304
## lambda (gene 1): 0.643697
## epsilon (gene 1): 0.361387
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 38960 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 187.768
## delta (gene 1): 11.9119
## s (cell 1): 0.997307
## nu (cell 1): 0.964702
## theta (batch 1): 0.00594734
## betas:    1.7557  -0.1786  -0.0246  -0.5738   0.4238   1.1072   0.3897   1.0797   1.2486   0.2853  -(
##
## sigma: 0.183058
## lambda (gene 1): 0.543706
## epsilon (gene 1): 0.0754308
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 39000 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 163.482
## delta (gene 1): 18.6602
## s (cell 1): 1.06521
## nu (cell 1): 1.07533
## theta (batch 1): 0.00254001
## betas:    1.3572  -0.0581  -0.1700   0.4877   0.3092   1.3363   0.3896   1.1997   0.9936   0.4768  -(
##
## sigma: 0.182348
## lambda (gene 1): 2.87616
```

```
## epsilon (gene 1): 0.516222
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39040 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.006
## delta (gene 1): 16.009
## s (cell 1): 1.16332
## nu (cell 1): 1.14717
## theta (batch 1): 0.00335646
## betas:    1.1090  -0.0721   0.6826  -0.2373   0.3146   1.3943   0.7012   1.1126   1.1404   0.6265  -(
##
## sigma: 0.189281
## lambda (gene 1): 0.422181
## epsilon (gene 1): 0.352846
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39080 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 184.853
## delta (gene 1): 17.8639
## s (cell 1): 1.10673
## nu (cell 1): 1.06491
## theta (batch 1): 0.010761
## betas:    1.2031  -0.0986   0.1397   0.1033   0.4646   1.2051   0.6105   1.3246   0.8538   0.9376  -(
##
## sigma: 0.180528
## lambda (gene 1): 0.429264
## epsilon (gene 1): 0.456109
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39120 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.476
## delta (gene 1): 14.5627
## s (cell 1): 0.964775
```

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## nu (cell 1): 1.033
## theta (batch 1): 0.0145679
## betas:    1.1631  -0.2221  -0.3403  -0.2778   1.1917   0.8675   0.7777   1.3224   1.4160   0.6208
##
## sigma: 0.18222
## lambda (gene 1): 0.334878
## epsilon (gene 1): 0.229576
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39160 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 238.854
## delta (gene 1): 14.0805
## s (cell 1): 1.00479
## nu (cell 1): 1.04509
## theta (batch 1): 0.0142965
## betas:    1.5504  -0.1533  -0.2766   0.2410   0.8818   0.5533   0.9444   0.8142   1.3954   0.3693
##
## sigma: 0.173804
## lambda (gene 1): 0.853501
## epsilon (gene 1): 0.231156
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39200 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 251.701
## delta (gene 1): 12.6893
## s (cell 1): 1.16934
## nu (cell 1): 1.04118
## theta (batch 1): 0.021063
## betas:    1.1624  -0.1263   0.4431   0.4803   0.6307   0.9078   0.8515   1.0571   1.3942   0.3972
##
## sigma: 0.185284
## lambda (gene 1): 0.725532
## epsilon (gene 1): 0.109542
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
```

```
## Iteration 39240 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 250.044
## delta (gene 1): 16.9757
## s (cell 1): 0.955501
## nu (cell 1): 1.05079
## theta (batch 1): 0.0127217
## betas:    1.4007  -0.1623  -0.3326  -0.2117   0.3389   1.3930   0.6428   0.8086   1.6921   0.1240   (
##
## sigma: 0.179039
## lambda (gene 1): 1.06252
## epsilon (gene 1): 0.407192
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 39280 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 171.874
## delta (gene 1): 11.9301
## s (cell 1): 0.8665
## nu (cell 1): 1.02662
## theta (batch 1): 0.0077785
## betas:    0.6341  -0.0916   0.2336   0.6315   0.7944   1.2263   1.1123   1.1725   1.2423   1.1281  -(
##
## sigma: 0.179864
## lambda (gene 1): 2.26391
## epsilon (gene 1): 0.0388405
## -----------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -----------------------------------------------------
## Iteration 39320 out of 40000 has been completed.
## -----------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 137.993
## delta (gene 1): 13.0596
## s (cell 1): 1.15998
## nu (cell 1): 1.04864
## theta (batch 1): 0.0117509
## betas:    1.6238  -0.1669   0.6895  -0.3340   0.3540   1.0069   0.8787   0.6535   1.3925   0.6135  -(
##
## sigma: 0.185348
## lambda (gene 1): 0.697905
## epsilon (gene 1): 0.137911
## -----------------------------------------------------
```

```
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39360 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 326.235
## delta (gene 1): 14.025
## s (cell 1): 1.20036
## nu (cell 1): 1.03766
## theta (batch 1): 0.0204728
## betas:    1.9348  -0.2951   0.2096  -0.4949   0.2145   0.7017   0.8861   0.6025   1.6932   0.4767  -(
##
## sigma: 0.177097
## lambda (gene 1): 0.278379
## epsilon (gene 1): 0.257275
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39400 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 252.043
## delta (gene 1): 15.3195
## s (cell 1): 1.15569
## nu (cell 1): 1.04555
## theta (batch 1): 0.0333678
## betas:    1.2312  -0.2190  -0.0929  -0.0269   0.6137   0.7949   1.1825   0.7934   1.7906   0.3669   (
##
## sigma: 0.185185
## lambda (gene 1): 1.90496
## epsilon (gene 1): 0.303748
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39440 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 183.594
## delta (gene 1): 10.881
## s (cell 1): 1.11371
## nu (cell 1): 1.08898
## theta (batch 1): 0.0291371
```

```
## betas:     1.5716  -0.2492  -0.7493  -0.2979   1.0012   0.5487   0.9365   0.9018   1.5218   0.6693  -
##
## sigma: 0.186794
## lambda (gene 1): 0.784303
## epsilon (gene 1): -0.0324864
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 39480 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 230.222
## delta (gene 1): 12.5097
## s (cell 1): 1.02505
## nu (cell 1): 1.01857
## theta (batch 1): 0.0329121
## betas:     1.6969  -0.2218  -0.4163   0.1247   0.6726   0.8913   0.5455   1.2362   1.0117   0.8687  -
##
## sigma: 0.18609
## lambda (gene 1): 3.02738
## epsilon (gene 1): 0.11027
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 39520 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 186.812
## delta (gene 1): 10.1715
## s (cell 1): 1.06181
## nu (cell 1): 1.03358
## theta (batch 1): 0.0188271
## betas:     1.6037  -0.1547  -0.1922  -0.1721   0.5221   1.0972   0.6118   0.7483   1.5379   0.3395  -
##
## sigma: 0.176714
## lambda (gene 1): 1.31948
## epsilon (gene 1): -0.102763
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 39560 out of 40000 has been completed.
## --------------------------------------------------------
```

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## Current draws for selected parameters are displayed below.
## mu (gene 1): 262.621
## delta (gene 1): 13.0475
## s (cell 1): 0.894753
## nu (cell 1): 1.06661
## theta (batch 1): 0.0263161
## betas:    1.0162  -0.1552  -0.6518   0.0562   0.0525   1.7624   0.6842   1.0647   1.6250   0.4006   (
##
## sigma: 0.180305
## lambda (gene 1): 0.852562
## epsilon (gene 1): 0.142113
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 39600 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 275.369
## delta (gene 1): 12.7015
## s (cell 1): 1.10765
## nu (cell 1): 1.12677
## theta (batch 1): 0.00492088
## betas:    1.6288  -0.1839  -0.0247  -0.4186   0.9326   0.6678   0.8380   0.8260   1.2277   0.8624  -(
##
## sigma: 0.184059
## lambda (gene 1): 1.8038
## epsilon (gene 1): 0.0909878
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 39640 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 257.051
## delta (gene 1): 12.2955
## s (cell 1): 0.989555
## nu (cell 1): 1.11736
## theta (batch 1): 0.0152416
## betas:    1.0024  -0.1350   0.0027   0.4578   0.9649   1.0811   0.8169   1.2329   1.2388   0.8495  -(
##
## sigma: 0.180588
## lambda (gene 1): 0.675747
## epsilon (gene 1): 0.0759064
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
```

```
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 39680 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 160.304
## delta (gene 1): 14.807
## s (cell 1): 1.18931
## nu (cell 1): 1.09279
## theta (batch 1): 0.00698726
## betas:    1.4625  -0.2150   0.8121  -0.2051   0.2340   1.2277   0.5037   1.2458   1.3495   0.4667   (
##
## sigma: 0.179494
## lambda (gene 1): 0.698747
## epsilon (gene 1): 0.294513
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 39720 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 156.168
## delta (gene 1): 12.0343
## s (cell 1): 1.26942
## nu (cell 1): 1.12944
## theta (batch 1): 0.00507214
## betas:    1.2848  -0.1591   0.1741   0.4855  -0.1392   1.6208   0.6299   0.9913   1.4508   0.4811  -(
##
## sigma: 0.174524
## lambda (gene 1): 1.95457
## epsilon (gene 1): 0.0738118
## ---------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## ---------------------------------------------------------
## Iteration 39760 out of 40000 has been completed.
## ---------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 260.206
## delta (gene 1): 15.71
## s (cell 1): 1.08075
## nu (cell 1): 1.13197
## theta (batch 1): 0.00464791
## betas:    1.5687  -0.2159  -0.5044   0.2153   0.5560   0.7177   0.8821   0.8950   1.3386   0.7572  -(
##
```

```
## sigma: 0.184312
## lambda (gene 1): 1.36961
## epsilon (gene 1): 0.332155
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 39800 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 277.738
## delta (gene 1): 11.8532
## s (cell 1): 1.07283
## nu (cell 1): 1.10259
## theta (batch 1): 0.00161363
## betas:    1.1342  -0.1125   0.1794   0.7323   0.2724   1.2358   0.7965   1.1251   1.1731   0.7519  -(
##
## sigma: 0.172527
## lambda (gene 1): 0.643801
## epsilon (gene 1): 0.0364543
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 39840 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 270.268
## delta (gene 1): 12.3261
## s (cell 1): 1.05474
## nu (cell 1): 1.09582
## theta (batch 1): 0.00346013
## betas:    1.0416  -0.2451  -0.5106   0.0264   0.7258   0.8317   1.1263   1.1487   1.4987   1.0052  -(
##
## sigma: 0.181653
## lambda (gene 1): 0.371373
## epsilon (gene 1): 0.0755928
## --------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## --------------------------------------------------------
## Iteration 39880 out of 40000 has been completed.
## --------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 195.38
```

```
## delta (gene 1): 12.0742
## s (cell 1): 1.13487
## nu (cell 1): 1.11531
## theta (batch 1): 0.00271341
## betas:    1.0147  -0.2623  -0.1432  -0.2494   1.0878   1.0781   0.7324   1.3492   1.6642   0.7699   (
##
## sigma: 0.167168
## lambda (gene 1): 1.5925
## epsilon (gene 1): 0.0752299
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39920 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 178.051
## delta (gene 1): 17.2473
## s (cell 1): 1.00861
## nu (cell 1): 1.05888
## theta (batch 1): 0.00146302
## betas:    1.1874  -0.1865   0.0263   0.2693   0.3798   0.8515   1.2423   0.7572   1.6281   0.5876  -(
##
## sigma: 0.177566
## lambda (gene 1): 1.36918
## epsilon (gene 1): 0.422977
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
## LStheta (batch 1): -2.2
## -------------------------------------------------------
## Iteration 39960 out of 40000 has been completed.
## -------------------------------------------------------
## Current draws for selected parameters are displayed below.
## mu (gene 1): 331.308
## delta (gene 1): 14.2765
## s (cell 1): 1.09957
## nu (cell 1): 1.08554
## theta (batch 1): 0.00153331
## betas:    1.1123  -0.0825   0.2004   0.4371   0.3214   1.3754   0.5641   1.3518   0.9457   0.8759  -(
##
## sigma: 0.181899
## lambda (gene 1): 1.07183
## epsilon (gene 1): 0.236023
## -------------------------------------------------------
## Current proposal variances for Metropolis Hastings updates (log-scale).
## LSmu (gene 1): -1.2
## LSdelta (gene 1): -2.2
## LSnu (cell 1): -4.4
```

```
## LStheta (batch 1): -2.2
##
## ----------------------------------------------------------
## ----------------------------------------------------------
## All 40000 MCMC iterations have been completed.
## ----------------------------------------------------------
## ----------------------------------------------------------
##
## ----------------------------------------------------------
## Please see below a summary of the overall acceptance rates.
## ----------------------------------------------------------
##
## Minimum acceptance rate among mu[i]'s: 0.10105
## Average acceptance rate among mu[i]'s: 0.457229
## Maximum acceptance rate among mu[i]'s: 0.84655
##
##
## Minimum acceptance rate among delta[i]'s: 0.36495
## Average acceptance rate among delta[i]'s: 0.449687
## Maximum acceptance rate among delta[i]'s: 0.56125
##
##
## Minimum acceptance rate among nu[jk]'s: 0.37005
## Average acceptance rate among nu[jk]'s: 0.429861
## Maximum acceptance rate among nu[jk]'s: 0.49645
##
##
## Minimum acceptance rate among theta[k]'s: 0.45765
## Average acceptance rate among theta[k]'s: 0.45765
## Maximum acceptance rate among theta[k]'s: 0.45765
##
##
## ----------------------------------------------------------
##


## ----------------------------------------------------------------
## MCMC running time
## ----------------------------------------------------------------
## user: 23260.975
## system: 18198.76
## elapsed: 5893.263


## ----------------------------------------------------------------
## Output
## ----------------------------------------------------------------


## ----------------------------------------------------------------
## BASiCS_Chain object stored as chain_naive_nospikes.Rds file in
## 'rds/' directory ...
## ----------------------------------------------------------------


## ----------------------------------------------------------------
## BASiCS version 2.14.0 : horizontal integration (no-spikes case)
## ----------------------------------------------------------------
```

```
## Randomly, 1 out of 1034
## genes was left as reference at each iteration
## List of reference genes and frequencies stored as a .txt file in
## 'rds/' directory ...
## -------------------------------------------------------------
```

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