

# R phyloseq tutorial v2 2022-03-22

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```
require(tidyverse); packageVersion("tidyverse")

## Loading required package: tidyverse
## -- Attaching packages ----- tidyverse 1.3.1.9000 --
## v ggplot2 3.3.5      v purrr   0.3.4
## v tibble  3.1.6      v dplyr  1.0.8
## v tidyr   1.2.0      v stringr 1.4.0
## v readr   2.1.2      v forcats 0.5.1

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()
require(phyloseq); packageVersion("phyloseq")

## Loading required package: phyloseq
options(getClass.msg=FALSE) # https://github.com/epurdorom/clusterExperiment/issues/66
```

## PolyFermS:

```
"~/Documents/GitHub/NRP72-FBT/data/processed/16S/ps_silva_dada2_human_chicken_meta.RDS" %>%
  readRDS() %>%
  subset_samples(Model == "Chicken" & Experiment == "Continuous" & Enrichment == "NotEnriched" & is.na(
    # subset_samples(tabled < 20000 & tabled > 1000) %>%
  filter_taxa(function(x) sum(x > 0) > 0, TRUE) -> ps_poly

ps_poly %>%
  sample_data() %>%
  data.frame() %>%
  select(-I7_Index_ID, -index, -I5_Index_ID, -index2, -metagenomic_sample_name, -raw_metagenomic_pairs, -)
  mutate(Treatment = recode(Treatment,
                             `UNTREATED` = "Control",
                             `CTX` = "Antibiotic_A",
                             `VAN` = "Antibiotic_B"),
         Antibiotic = recode(Antibiotic,
```

```

`UNTREATED` = "Control",
`CTX` = "Antibiotic_A",
`VAN` = "Antibiotic_B")) -> sample_data(ps_poly)

ps_poly %>%
  sample_data() %>%
  data.frame()

```

##	sample	input	filtered	denoisedF	denoisedR	merged	tabled
##	IR1-16-S307	IR1-16-S307	16273	16228	16215	16126	15817
##	IR1-17-S279	IR1-17-S279	30887	30807	30773	30662	29870
##	IR1-18-S287	IR1-18-S287	35051	34926	34793	34693	33078
##	IR1-2-S96	IR1-2-S96	30159	30092	29944	29869	28243
##	IR1-24-S295	IR1-24-S295	14265	14243	14204	14153	13732
##	IR1-26-S119	IR1-26-S119	23432	23326	23307	23183	22620
##	IR1-3-S320	IR1-3-S320	8883	8865	8849	8809	8524
##	IR1-36-S159	IR1-36-S159	13340	13281	13264	13212	12937
##	IR1-37-S343	IR1-37-S343	21794	21690	21647	21601	21252
##	IR1-38-S337	IR1-38-S337	23007	22866	22847	22795	22423
##	IR1-39-S351	IR1-39-S351	8706	8655	8649	8623	8534
##	IR1-4-S223	IR1-4-S223	15037	15007	14984	14952	14505
##	IR1-43-S256	IR1-43-S256	17519	17412	17400	17329	16917
##	IR1-44-S264	IR1-44-S264	28866	28705	28687	28583	28096
##	IR1-45-S128	IR1-45-S128	11987	11921	11899	11862	11554
##	IR1-48-S339	IR1-48-S339	16625	16570	16550	16481	16111
##	IR1-54-S130	IR1-54-S130	26102	25956	25919	25869	25383
##	IR1-57-S356	IR1-57-S356	15767	15716	15688	15602	15202
##	IR1-6-S250	IR1-6-S250	29718	29662	29625	29553	28757
##	IR1-63-S155	IR1-63-S155	20842	20719	20690	20617	20157
##	IR1-69-S198	IR1-69-S198	132	131	128	91	72
##	IR1-77-S202	IR1-77-S202	10448	10407	10391	10370	10153
##	IR1-8-S260	IR1-8-S260	25849	25766	25742	25634	25036
##	TR2-1-S273	TR2-1-S273	32834	32778	32729	32626	31606
##	TR2-13-S231	TR2-13-S231	22002	21915	21880	21840	21513
##	TR2-14-S232	TR2-14-S232	21133	21084	21028	20983	20461
##	TR2-15-S288	TR2-15-S288	31566	31486	31385	31307	30381
##	TR2-16-S184	TR2-16-S184	36760	36629	36533	36439	35449
##	TR2-17-S248	TR2-17-S248	31490	31404	31369	31205	30516
##	TR2-18-S326	TR2-18-S326	16339	16307	16275	16201	15845
##	TR2-19-S318	TR2-19-S318	10065	10054	10040	10015	9814
##	TR2-20-S271	TR2-20-S271	31072	31018	30982	30901	30167
##	TR2-21-S228	TR2-21-S228	15593	15567	15543	15456	14959
##	TR2-22-S364	TR2-22-S364	18760	18715	18688	18581	18015
##	TR2-25-S133	TR2-25-S133	10044	10028	10010	9980	9694
##	TR2-28-S286	TR2-28-S286	33858	33802	33626	33571	31718
##	TR2-3-S297	TR2-3-S297	16116	16088	16059	16017	15428
##	TR2-31-S182	TR2-31-S182	26488	26432	26391	26250	25319
##	TR2-34-S302	TR2-34-S302	114	113	108	100	84
##	TR2-37-S330	TR2-37-S330	16482	16456	16434	16356	15811
##	TR2-40-S259	TR2-40-S259	21185	21122	21105	21025	20547
##	TR2-46-S239	TR2-46-S239	25929	25888	25862	25757	25098
##	TR2-52-S230	TR2-52-S230	14560	14526	14512	14459	14058
##	TR2-58-S172	TR2-58-S172	24670	24606	24565	24436	23412
##	TR2-64-S216	TR2-64-S216	21707	21663	21627	21526	20850

##	TR4-1-S193	TR4-1-S193	55187	54986	54963	54881	54034	54034
##	TR4-13-S142	TR4-13-S142	19207	19074	19048	18973	18531	18531
##	TR4-14-S226	TR4-14-S226	20906	20783	20752	20695	20340	20340
##	TR4-15-S218	TR4-15-S218	21839	21709	21687	21638	21317	21317
##	TR4-16-S276	TR4-16-S276	17118	17032	17006	16951	16595	16595
##	TR4-17-S114	TR4-17-S114	28993	28752	28709	28624	28097	28097
##	TR4-18-S200	TR4-18-S200	104	102	99	81	53	53
##	TR4-19-S270	TR4-19-S270	28080	27827	27811	27758	27315	27315
##	TR4-20-S269	TR4-20-S269	20518	20360	20353	20315	20002	20002
##	TR4-21-S254	TR4-21-S254	21868	21735	21727	21684	21405	21405
##	TR4-22-S344	TR4-22-S344	16291	16251	16227	16158	15906	15906
##	TR4-25-S333	TR4-25-S333	14939	14883	14871	14817	14608	14608
##	TR4-28-S183	TR4-28-S183	13668	13587	13562	13510	13345	13345
##	TR4-3-S309	TR4-3-S309	22955	22915	22888	22810	22206	22206
##	TR4-31-S278	TR4-31-S278	30109	29927	29902	29815	29549	29549
##	TR4-34-S342	TR4-34-S342	13943	13880	13863	13793	13647	13647
##	TR4-37-S188	TR4-37-S188	24208	24010	23977	23844	23524	23524
##	TR4-40-S242	TR4-40-S242	33403	33159	33099	33044	32725	32725
##	TR4-46-S215	TR4-46-S215	25294	25090	25053	24965	24729	24729
##	TR4-52-S95	TR4-52-S95	35250	35030	34978	34883	34505	34505
##	TR4-58-S112	TR4-58-S112	12291	12236	12219	12176	12075	12075
##	TR4-64-S220	TR4-64-S220	15761	15686	15672	15607	15483	15483
##		filtered_pc	denoisedF_pc	denoisedR_pc	merged_pc		filtered_merged_pc	
##	IR1-16-S307	0.997	0.999	0.994	0.975		0.975	
##	IR1-17-S279	0.997	0.999	0.995	0.971		0.970	
##	IR1-18-S287	0.996	0.996	0.993	0.951		0.947	
##	IR1-2-S96	0.998	0.995	0.993	0.943		0.939	
##	IR1-24-S295	0.998	0.997	0.994	0.967		0.964	
##	IR1-26-S119	0.995	0.999	0.994	0.971		0.970	
##	IR1-3-S320	0.998	0.998	0.994	0.963		0.962	
##	IR1-36-S159	0.996	0.999	0.995	0.975		0.974	
##	IR1-37-S343	0.995	0.998	0.996	0.982		0.980	
##	IR1-38-S337	0.994	0.999	0.997	0.981		0.981	
##	IR1-39-S351	0.994	0.999	0.996	0.987		0.986	
##	IR1-4-S223	0.998	0.998	0.996	0.968		0.967	
##	IR1-43-S256	0.994	0.999	0.995	0.972		0.972	
##	IR1-44-S264	0.994	0.999	0.996	0.979		0.979	
##	IR1-45-S128	0.994	0.998	0.995	0.971		0.969	
##	IR1-48-S339	0.997	0.999	0.995	0.973		0.972	
##	IR1-54-S130	0.994	0.999	0.997	0.979		0.978	
##	IR1-57-S356	0.997	0.998	0.993	0.969		0.967	
##	IR1-6-S250	0.998	0.999	0.996	0.971		0.969	
##	IR1-63-S155	0.994	0.999	0.995	0.974		0.973	
##	IR1-69-S198	0.992	0.977	0.695	0.562		0.550	
##	IR1-77-S202	0.996	0.998	0.996	0.977		0.976	
##	IR1-8-S260	0.997	0.999	0.995	0.973		0.972	
##	TR2-1-S273	0.998	0.999	0.995	0.966		0.964	
##	TR2-13-S231	0.996	0.998	0.997	0.983		0.982	
##	TR2-14-S232	0.998	0.997	0.995	0.973		0.970	
##	TR2-15-S288	0.997	0.997	0.994	0.968		0.965	
##	TR2-16-S184	0.996	0.997	0.995	0.970		0.968	
##	TR2-17-S248	0.997	0.999	0.994	0.973		0.972	
##	TR2-18-S326	0.998	0.998	0.993	0.974		0.972	
##	TR2-19-S318	0.999	0.999	0.996	0.977		0.976	

## TR2-20-S271	0.998	0.999	0.996	0.974	0.973
## TR2-21-S228	0.998	0.998	0.993	0.962	0.961
## TR2-22-S364	0.998	0.999	0.993	0.964	0.963
## TR2-25-S133	0.998	0.998	0.995	0.968	0.967
## TR2-28-S286	0.998	0.995	0.993	0.943	0.938
## TR2-3-S297	0.998	0.998	0.996	0.961	0.959
## TR2-31-S182	0.998	0.998	0.993	0.959	0.958
## TR2-34-S302	0.991	0.956	0.885	0.778	0.743
## TR2-37-S330	0.998	0.999	0.994	0.962	0.961
## TR2-40-S259	0.997	0.999	0.995	0.974	0.973
## TR2-46-S239	0.998	0.999	0.995	0.970	0.969
## TR2-52-S230	0.998	0.999	0.995	0.969	0.968
## TR2-58-S172	0.997	0.998	0.993	0.953	0.951
## TR2-64-S216	0.998	0.998	0.994	0.964	0.962
## TR4-1-S193	0.996	1.000	0.998	0.983	0.983
## TR4-13-S142	0.993	0.999	0.995	0.973	0.972
## TR4-14-S226	0.994	0.999	0.996	0.980	0.979
## TR4-15-S218	0.994	0.999	0.997	0.983	0.982
## TR4-16-S276	0.995	0.998	0.995	0.976	0.974
## TR4-17-S114	0.992	0.999	0.996	0.979	0.977
## TR4-18-S200	0.981	0.971	0.794	0.535	0.520
## TR4-19-S270	0.991	0.999	0.998	0.982	0.982
## TR4-20-S269	0.992	1.000	0.998	0.983	0.982
## TR4-21-S254	0.994	1.000	0.998	0.985	0.985
## TR4-22-S344	0.998	0.999	0.994	0.980	0.979
## TR4-25-S333	0.996	0.999	0.996	0.982	0.982
## TR4-28-S183	0.994	0.998	0.994	0.984	0.982
## TR4-3-S309	0.998	0.999	0.995	0.970	0.969
## TR4-31-S278	0.994	0.999	0.996	0.988	0.987
## TR4-34-S342	0.995	0.999	0.994	0.984	0.983
## TR4-37-S188	0.992	0.999	0.993	0.981	0.980
## TR4-40-S242	0.993	0.998	0.997	0.989	0.987
## TR4-46-S215	0.992	0.999	0.995	0.987	0.986
## TR4-52-S95	0.994	0.999	0.996	0.986	0.985
## TR4-58-S112	0.996	0.999	0.995	0.988	0.987
## TR4-64-S220	0.995	0.999	0.995	0.988	0.987
##	input_merged_pc	tabled_joined	chimera_out	length_filtered	tabled_pc
## IR1-16-S307	0.972	15817	15593	15593	1
## IR1-17-S279	0.967	29870	29056	29056	1
## IR1-18-S287	0.944	33078	29765	29765	1
## IR1-2-S96	0.936	28243	25344	25344	1
## IR1-24-S295	0.963	13732	13307	13307	1
## IR1-26-S119	0.965	22620	22248	22246	1
## IR1-3-S320	0.960	8524	8417	8417	1
## IR1-36-S159	0.970	12937	12724	12724	1
## IR1-37-S343	0.975	21252	20777	20772	1
## IR1-38-S337	0.975	22423	21618	21614	1
## IR1-39-S351	0.980	8534	8340	8339	1
## IR1-4-S223	0.965	14505	14293	14293	1
## IR1-43-S256	0.966	16917	16642	16642	1
## IR1-44-S264	0.973	28096	27507	27507	1
## IR1-45-S128	0.964	11554	11363	11363	1
## IR1-48-S339	0.969	16111	15811	15811	1
## IR1-54-S130	0.972	25383	24758	24758	1

##	IR1-57-S356	0.964	15202	14958	14958	1
##	IR1-6-S250	0.968	28757	28202	28202	1
##	IR1-63-S155	0.967	20157	19681	19679	1
##	IR1-69-S198	0.545	72	72	72	1
##	IR1-77-S202	0.972	10153	10002	10000	1
##	IR1-8-S260	0.969	25036	24358	24358	1
##	TR2-1-S273	0.963	31606	30573	30573	1
##	TR2-13-S231	0.978	21513	21064	21063	1
##	TR2-14-S232	0.968	20461	19700	19700	1
##	TR2-15-S288	0.962	30381	28832	28832	1
##	TR2-16-S184	0.964	35449	34188	34185	1
##	TR2-17-S248	0.969	30516	30071	30071	1
##	TR2-18-S326	0.970	15845	15515	15515	1
##	TR2-19-S318	0.975	9814	9662	9662	1
##	TR2-20-S271	0.971	30167	29595	29595	1
##	TR2-21-S228	0.959	14959	14630	14630	1
##	TR2-22-S364	0.960	18015	17620	17620	1
##	TR2-25-S133	0.965	9694	9527	9527	1
##	TR2-28-S286	0.937	31718	28751	28751	1
##	TR2-3-S297	0.957	15428	15094	15094	1
##	TR2-31-S182	0.956	25319	24528	24528	1
##	TR2-34-S302	0.737	84	84	84	1
##	TR2-37-S330	0.959	15811	15473	15473	1
##	TR2-40-S259	0.970	20547	20312	20312	1
##	TR2-46-S239	0.968	25098	24475	24475	1
##	TR2-52-S230	0.966	14058	13833	13833	1
##	TR2-58-S172	0.949	23412	22828	22828	1
##	TR2-64-S216	0.961	20850	20344	20344	1
##	TR4-1-S193	0.979	54034	51873	51857	1
##	TR4-13-S142	0.965	18531	18061	18061	1
##	TR4-14-S226	0.973	20340	20007	20007	1
##	TR4-15-S218	0.976	21317	20936	20936	1
##	TR4-16-S276	0.969	16595	16308	16308	1
##	TR4-17-S114	0.969	28097	27386	27381	1
##	TR4-18-S200	0.510	53	52	52	1
##	TR4-19-S270	0.973	27315	26523	26523	1
##	TR4-20-S269	0.975	20002	19498	19494	1
##	TR4-21-S254	0.979	21405	20811	20805	1
##	TR4-22-S344	0.976	15906	15392	15392	1
##	TR4-25-S333	0.978	14608	14213	14213	1
##	TR4-28-S183	0.976	13345	12958	12958	1
##	TR4-3-S309	0.967	22206	21693	21693	1
##	TR4-31-S278	0.981	29549	28468	28465	1
##	TR4-34-S342	0.979	13647	13296	13296	1
##	TR4-37-S188	0.972	23524	22202	22197	1
##	TR4-40-S242	0.980	32725	31714	31714	1
##	TR4-46-S215	0.978	24729	23673	23673	1
##	TR4-52-S95	0.979	34505	32412	32400	1
##	TR4-58-S112	0.982	12075	11655	11655	1
##	TR4-64-S220	0.982	15483	15160	15160	1
##	chimera_out_pc length_filtered_pc Description2 Experiment Reactor					
##	IR1-16-S307	0.99	1	<NA>	Continuous	IR
##	IR1-17-S279	0.97	1	<NA>	Continuous	IR
##	IR1-18-S287	0.90	1	<NA>	Continuous	IR

## IR1-2-S96	0.90	1	<NA> Continuous	IR
## IR1-24-S295	0.97	1	<NA> Continuous	IR
## IR1-26-S119	0.98	1	<NA> Continuous	IR
## IR1-3-S320	0.99	1	<NA> Continuous	IR
## IR1-36-S159	0.98	1	<NA> Continuous	IR
## IR1-37-S343	0.98	1	<NA> Continuous	IR
## IR1-38-S337	0.96	1	<NA> Continuous	IR
## IR1-39-S351	0.98	1	<NA> Continuous	IR
## IR1-4-S223	0.99	1	<NA> Continuous	IR
## IR1-43-S256	0.98	1	<NA> Continuous	IR
## IR1-44-S264	0.98	1	<NA> Continuous	IR
## IR1-45-S128	0.98	1	<NA> Continuous	IR
## IR1-48-S339	0.98	1	<NA> Continuous	IR
## IR1-54-S130	0.98	1	<NA> Continuous	IR
## IR1-57-S356	0.98	1	<NA> Continuous	IR
## IR1-6-S250	0.98	1	<NA> Continuous	IR
## IR1-63-S155	0.98	1	<NA> Continuous	IR
## IR1-69-S198	1.00	1	<NA> Continuous	IR
## IR1-77-S202	0.99	1	<NA> Continuous	IR
## IR1-8-S260	0.97	1	<NA> Continuous	IR
## TR2-1-S273	0.97	1	<NA> Continuous	TR2
## TR2-13-S231	0.98	1	<NA> Continuous	TR2
## TR2-14-S232	0.96	1	<NA> Continuous	TR2
## TR2-15-S288	0.95	1	<NA> Continuous	TR2
## TR2-16-S184	0.96	1	<NA> Continuous	TR2
## TR2-17-S248	0.99	1	<NA> Continuous	TR2
## TR2-18-S326	0.98	1	<NA> Continuous	TR2
## TR2-19-S318	0.98	1	<NA> Continuous	TR2
## TR2-20-S271	0.98	1	<NA> Continuous	TR2
## TR2-21-S228	0.98	1	<NA> Continuous	TR2
## TR2-22-S364	0.98	1	<NA> Continuous	TR2
## TR2-25-S133	0.98	1	<NA> Continuous	TR2
## TR2-28-S286	0.91	1	<NA> Continuous	TR2
## TR2-3-S297	0.98	1	<NA> Continuous	TR2
## TR2-31-S182	0.97	1	<NA> Continuous	TR2
## TR2-34-S302	1.00	1	<NA> Continuous	TR2
## TR2-37-S330	0.98	1	<NA> Continuous	TR2
## TR2-40-S259	0.99	1	<NA> Continuous	TR2
## TR2-46-S239	0.98	1	<NA> Continuous	TR2
## TR2-52-S230	0.98	1	<NA> Continuous	TR2
## TR2-58-S172	0.98	1	<NA> Continuous	TR2
## TR2-64-S216	0.98	1	<NA> Continuous	TR2
## TR4-1-S193	0.96	1	<NA> Continuous	TR4
## TR4-13-S142	0.97	1	<NA> Continuous	TR4
## TR4-14-S226	0.98	1	<NA> Continuous	TR4
## TR4-15-S218	0.98	1	<NA> Continuous	TR4
## TR4-16-S276	0.98	1	<NA> Continuous	TR4
## TR4-17-S114	0.97	1	<NA> Continuous	TR4
## TR4-18-S200	0.98	1	<NA> Continuous	TR4
## TR4-19-S270	0.97	1	<NA> Continuous	TR4
## TR4-20-S269	0.97	1	<NA> Continuous	TR4
## TR4-21-S254	0.97	1	<NA> Continuous	TR4
## TR4-22-S344	0.97	1	<NA> Continuous	TR4
## TR4-25-S333	0.97	1	<NA> Continuous	TR4

## TR4-28-S183	0.97	1	<NA> Continuous	TR4
## TR4-3-S309	0.98	1	<NA> Continuous	TR4
## TR4-31-S278	0.96	1	<NA> Continuous	TR4
## TR4-34-S342	0.97	1	<NA> Continuous	TR4
## TR4-37-S188	0.94	1	<NA> Continuous	TR4
## TR4-40-S242	0.97	1	<NA> Continuous	TR4
## TR4-46-S215	0.96	1	<NA> Continuous	TR4
## TR4-52-S95	0.94	1	<NA> Continuous	TR4
## TR4-58-S112	0.97	1	<NA> Continuous	TR4
## TR4-64-S220	0.98	1	<NA> Continuous	TR4
##	Treatment	Day_of_Connection	Day_of_Treatment	Day_from_Inoculum
## IR1-16-S307	Control	-7	-23	16
## IR1-17-S279	Control	-6	-22	17
## IR1-18-S287	Control	-4	-20	19
## IR1-2-S96	Control	-21	-37	2
## IR1-24-S295	Control	1	-15	24
## IR1-26-S119	Control	3	-13	26
## IR1-3-S320	Control	-20	-36	3
## IR1-36-S159	Control	13	-3	36
## IR1-37-S343	Control	14	-2	37
## IR1-38-S337	Control	15	-1	38
## IR1-39-S351	Control	16	0	39
## IR1-4-S223	Control	-19	-35	4
## IR1-43-S256	Control	20	4	43
## IR1-44-S264	Control	21	5	44
## IR1-45-S128	Control	22	6	45
## IR1-48-S339	Control	25	9	48
## IR1-54-S130	Control	31	19	54
## IR1-57-S356	Control	34	18	57
## IR1-6-S250	Control	-17	-33	6
## IR1-63-S155	Control	40	24	63
## IR1-69-S198	Control	46	30	69
## IR1-77-S202	Control	54	38	77
## IR1-8-S260	Control	-15	-31	8
## TR2-1-S273	Antibiotic_A	1	-15	24
## TR2-13-S231	Antibiotic_A	13	-3	36
## TR2-14-S232	Antibiotic_A	14	-2	37
## TR2-15-S288	Antibiotic_A	15	-1	38
## TR2-16-S184	Antibiotic_A	16	0	39
## TR2-17-S248	Antibiotic_A	17	1	40
## TR2-18-S326	Antibiotic_A	18	2	41
## TR2-19-S318	Antibiotic_A	19	3	42
## TR2-20-S271	Antibiotic_A	20	4	43
## TR2-21-S228	Antibiotic_A	21	5	44
## TR2-22-S364	Antibiotic_A	22	6	45
## TR2-25-S133	Antibiotic_A	25	9	48
## TR2-28-S286	Antibiotic_A	28	12	51
## TR2-3-S297	Antibiotic_A	3	-13	26
## TR2-31-S182	Antibiotic_A	31	15	54
## TR2-34-S302	Antibiotic_A	34	18	57
## TR2-37-S330	Antibiotic_A	37	21	60
## TR2-40-S259	Antibiotic_A	40	24	63
## TR2-46-S239	Antibiotic_A	46	30	69
## TR2-52-S230	Antibiotic_A	52	36	75

##	TR2-58-S172	Antibiotic_A	58	42	81
##	TR2-64-S216	Antibiotic_A	64	48	87
##	TR4-1-S193	Antibiotic_B	1	-15	24
##	TR4-13-S142	Antibiotic_B	13	-3	36
##	TR4-14-S226	Antibiotic_B	14	-2	37
##	TR4-15-S218	Antibiotic_B	15	-1	38
##	TR4-16-S276	Antibiotic_B	16	0	39
##	TR4-17-S114	Antibiotic_B	17	1	40
##	TR4-18-S200	Antibiotic_B	18	2	41
##	TR4-19-S270	Antibiotic_B	19	3	42
##	TR4-20-S269	Antibiotic_B	20	4	43
##	TR4-21-S254	Antibiotic_B	21	5	44
##	TR4-22-S344	Antibiotic_B	22	6	45
##	TR4-25-S333	Antibiotic_B	25	9	48
##	TR4-28-S183	Antibiotic_B	28	12	51
##	TR4-3-S309	Antibiotic_B	3	-13	26
##	TR4-31-S278	Antibiotic_B	31	15	54
##	TR4-34-S342	Antibiotic_B	34	18	57
##	TR4-37-S188	Antibiotic_B	37	21	60
##	TR4-40-S242	Antibiotic_B	40	24	63
##	TR4-46-S215	Antibiotic_B	46	30	69
##	TR4-52-S95	Antibiotic_B	52	36	75
##	TR4-58-S112	Antibiotic_B	58	42	81
##	TR4-64-S220	Antibiotic_B	64	48	87
##	Phase Treatment2 Paul GeneCopyNumberperML Antibiotic_mg.mL				
##	IR1-16-S307	Stab	UNTREATED <NA>	3.26e+10	NA
##	IR1-17-S279	Stab	UNTREATED <NA>	3.20e+10	NA
##	IR1-18-S287	Stab	UNTREATED <NA>	2.79e+10	NA
##	IR1-2-S96	Stab	UNTREATED <NA>	2.60e+10	NA
##	IR1-24-S295	Stab	UNTREATED <NA>	2.49e+10	NA
##	IR1-26-S119	Stab	UNTREATED <NA>	2.82e+10	NA
##	IR1-3-S320	Stab	UNTREATED <NA>	4.42e+10	NA
##	IR1-36-S159	Stab	UNTREATED <NA>	3.15e+10	NA
##	IR1-37-S343	Stab	UNTREATED <NA>	5.33e+10	NA
##	IR1-38-S337	Stab	UNTREATED <NA>	6.54e+10	NA
##	IR1-39-S351	Treat	UNTREATED <NA>	6.42e+10	NA
##	IR1-4-S223	Stab	UNTREATED <NA>	4.44e+10	NA
##	IR1-43-S256	Treat	UNTREATED <NA>	5.42e+10	NA
##	IR1-44-S264	Treat	UNTREATED <NA>	4.10e+10	NA
##	IR1-45-S128	Treat	UNTREATED <NA>	3.32e+10	NA
##	IR1-48-S339	Treat	UNTREATED <NA>	2.95e+10	NA
##	IR1-54-S130	Treat	UNTREATED <NA>	2.27e+10	NA
##	IR1-57-S356	Treat	UNTREATED <NA>	2.04e+10	NA
##	IR1-6-S250	Stab	UNTREATED <NA>	4.10e+10	NA
##	IR1-63-S155	Treat	UNTREATED <NA>	2.56e+10	NA
##	IR1-69-S198	Treat	UNTREATED <NA>	3.99e+10	NA
##	IR1-77-S202	Treat	UNTREATED <NA>	3.14e+10	NA
##	IR1-8-S260	Stab	UNTREATED <NA>	5.58e+10	NA
##	TR2-1-S273	Stab	AB <NA>	3.49e+10	20
##	TR2-13-S231	Stab	AB <NA>	5.27e+10	20
##	TR2-14-S232	Stab	AB <NA>	5.78e+10	20
##	TR2-15-S288	Stab	AB <NA>	6.23e+10	20
##	TR2-16-S184	Treat	AB <NA>	4.77e+10	20
##	TR2-17-S248	Treat	AB <NA>	2.71e+10	20



##	TR2-18-S326	Treat	AB <NA>	3.22e+10	20	
##	TR2-19-S318	Treat	AB <NA>	4.20e+10	20	
##	TR2-20-S271	Treat	AB <NA>	2.27e+10	20	
##	TR2-21-S228	Treat	AB <NA>	2.89e+10	20	
##	TR2-22-S364	Treat	AB <NA>	3.98e+10	20	
##	TR2-25-S133	Treat	AB <NA>	3.16e+10	20	
##	TR2-28-S286	Treat	AB <NA>	3.16e+10	20	
##	TR2-3-S297	Stab	AB <NA>	4.23e+10	20	
##	TR2-31-S182	Treat	AB <NA>	2.61e+10	20	
##	TR2-34-S302	Treat	AB <NA>	2.79e+10	20	
##	TR2-37-S330	Treat	AB <NA>	2.08e+10	20	
##	TR2-40-S259	Treat	AB <NA>	2.77e+10	20	
##	TR2-46-S239	Treat	AB <NA>	5.05e+10	20	
##	TR2-52-S230	Treat	AB <NA>	3.52e+10	20	
##	TR2-58-S172	Treat	AB <NA>	2.54e+10	20	
##	TR2-64-S216	Treat	AB <NA>	2.79e+10	20	
##	TR4-1-S193	Stab	AB <NA>	3.40e+10	90	
##	TR4-13-S142	Stab	AB <NA>	5.63e+10	90	
##	TR4-14-S226	Stab	AB <NA>	5.00e+10	90	
##	TR4-15-S218	Stab	AB <NA>	6.68e+10	90	
##	TR4-16-S276	Treat	AB <NA>	3.96e+10	90	
##	TR4-17-S114	Treat	AB <NA>	3.74e+10	90	
##	TR4-18-S200	Treat	AB <NA>	6.03e+10	90	
##	TR4-19-S270	Treat	AB <NA>	5.61e+10	90	
##	TR4-20-S269	Treat	AB <NA>	4.27e+10	90	
##	TR4-21-S254	Treat	AB <NA>	5.82e+10	90	
##	TR4-22-S344	Treat	AB <NA>	7.52e+10	90	
##	TR4-25-S333	Treat	AB <NA>	4.16e+10	90	
##	TR4-28-S183	Treat	AB <NA>	4.30e+10	90	
##	TR4-3-S309	Stab	AB <NA>	3.98e+10	90	
##	TR4-31-S278	Treat	AB <NA>	4.38e+10	90	
##	TR4-34-S342	Treat	AB <NA>	4.68e+10	90	
##	TR4-37-S188	Treat	AB <NA>	5.12e+10	90	
##	TR4-40-S242	Treat	AB <NA>	5.57e+10	90	
##	TR4-46-S215	Treat	AB <NA>	6.31e+10	90	
##	TR4-52-S95	Treat	AB <NA>	4.94e+10	90	
##	TR4-58-S112	Treat	AB <NA>	7.74e+10	90	
##	TR4-64-S220	Treat	AB <NA>	6.94e+10	90	
##		Fermentation	Antibiotic	Lactose_mM	Glucose_mM	Galactose_mM
##	IR1-16-S307	NA	<NA>	0.111	0.000	0.000
##	IR1-17-S279	NA	<NA>	0.108	0.000	0.000
##	IR1-18-S287	NA	<NA>	0.112	0.000	0.000
##	IR1-2-S96	NA	<NA>	0.000	0.000	0.000
##	IR1-24-S295	NA	<NA>	0.000	0.000	0.000
##	IR1-26-S119	NA	<NA>	0.000	0.000	0.000
##	IR1-3-S320	NA	<NA>	0.000	0.000	0.000
##	IR1-36-S159	NA	<NA>	0.000	0.000	0.000
##	IR1-37-S343	NA	<NA>	0.000	NA	0.000
##	IR1-38-S337	NA	<NA>	0.000	0.000	1.608
##	IR1-39-S351	NA	<NA>	0.000	0.000	1.765
##	IR1-4-S223	NA	<NA>	0.000	0.736	0.000
##	IR1-43-S256	NA	<NA>	0.000	0.000	0.000
##	IR1-44-S264	NA	<NA>	0.000	0.000	0.000
##	IR1-45-S128	NA	<NA>	NA	NA	NA

## IR1-48-S339	NA	<NA>	0.000	0.000	0.000
## IR1-54-S130	NA	<NA>	0.000	0.000	0.000
## IR1-57-S356	NA	<NA>	0.000	0.000	0.000
## IR1-6-S250	NA	<NA>	0.000	0.000	0.000
## IR1-63-S155	NA	<NA>	0.000	0.000	0.000
## IR1-69-S198	NA	<NA>	0.000	0.000	0.000
## IR1-77-S202	NA	<NA>	0.000	0.000	0.000
## IR1-8-S260	NA	<NA>	0.000	0.000	0.000
## TR2-1-S273	NA Antibiotic_A	NA	NA	NA	NA
## TR2-13-S231	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-14-S232	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-15-S288	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-16-S184	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-17-S248	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-18-S326	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-19-S318	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-20-S271	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-21-S228	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-22-S364	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-25-S133	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-28-S286	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-3-S297	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-31-S182	NA Antibiotic_A	0.000	0.000	0.000	1.008
## TR2-34-S302	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-37-S330	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-40-S259	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-46-S239	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-52-S230	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-58-S172	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR2-64-S216	NA Antibiotic_A	0.000	0.000	0.000	0.000
## TR4-1-S193	NA Antibiotic_B	NA	NA	NA	NA
## TR4-13-S142	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-14-S226	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-15-S218	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-16-S276	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-17-S114	NA Antibiotic_B	0.000	1.401	1.045	0.000
## TR4-18-S200	NA Antibiotic_B	0.000	0.000	1.532	0.000
## TR4-19-S270	NA Antibiotic_B	0.000	0.000	1.380	0.000
## TR4-20-S269	NA Antibiotic_B	0.000	0.446	1.237	0.000
## TR4-21-S254	NA Antibiotic_B	0.598	0.000	1.033	0.000
## TR4-22-S344	NA Antibiotic_B	0.471	0.383	0.000	0.000
## TR4-25-S333	NA Antibiotic_B	0.318	0.000	0.000	0.000
## TR4-28-S183	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-3-S309	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-31-S278	NA Antibiotic_B	NA	NA	NA	NA
## TR4-34-S342	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-37-S188	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-40-S242	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-46-S215	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-52-S95	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-58-S112	NA Antibiotic_B	0.000	0.000	0.000	0.000
## TR4-64-S220	NA Antibiotic_B	0.000	0.000	0.000	0.000
##	Succinat_mM	Lactat_mM	Formiat_mM	Acetat_mM	Propionat_mM
## IR1-16-S307	8.403	0.000	3.022	59.445	14.806

## IR1-17-S279	6.582	0.000	2.551	63.570	12.533
## IR1-18-S287	6.977	0.000	3.131	61.230	12.129
## IR1-2-S96	11.188	0.000	2.195	54.634	4.767
## IR1-24-S295	6.862	0.000	3.239	65.522	15.644
## IR1-26-S119	4.957	0.000	0.000	70.004	16.081
## IR1-3-S320	12.546	0.000	0.000	65.405	10.260
## IR1-36-S159	1.818	0.000	0.000	80.582	13.261
## IR1-37-S343	2.801	7.732	0.000	50.595	10.602
## IR1-38-S337	3.233	10.316	3.202	45.582	9.269
## IR1-39-S351	4.742	11.710	3.238	40.536	7.296
## IR1-4-S223	13.888	0.000	0.000	74.813	12.634
## IR1-43-S256	0.696	0.000	0.000	84.344	18.354
## IR1-44-S264	2.068	0.000	0.000	76.906	16.969
## IR1-45-S128	NA	NA	NA	NA	NA
## IR1-48-S339	0.674	0.000	0.000	69.611	10.977
## IR1-54-S130	0.646	0.000	0.000	65.814	11.962
## IR1-57-S356	0.330	0.000	0.000	67.957	10.292
## IR1-6-S250	14.292	0.000	0.000	83.221	12.127
## IR1-63-S155	0.356	0.000	0.000	71.316	12.482
## IR1-69-S198	0.000	0.000	0.000	78.578	12.904
## IR1-77-S202	0.000	4.346	0.000	74.352	13.977
## IR1-8-S260	11.229	0.000	0.000	77.668	12.081
## TR2-1-S273	NA	NA	NA	NA	NA
## TR2-13-S231	1.990	0.000	0.000	93.560	14.283
## TR2-14-S232	1.687	0.000	0.000	90.856	13.870
## TR2-15-S288	0.792	0.000	0.000	98.070	13.180
## TR2-16-S184	0.752	0.000	0.000	99.902	12.294
## TR2-17-S248	1.116	0.000	0.000	95.235	12.018
## TR2-18-S326	2.193	0.000	0.000	96.527	9.384
## TR2-19-S318	2.973	0.000	0.000	90.991	7.423
## TR2-20-S271	3.025	0.000	0.000	75.634	7.726
## TR2-21-S228	3.420	0.000	0.000	84.906	5.716
## TR2-22-S364	2.853	0.000	0.000	84.486	4.727
## TR2-25-S133	3.076	0.000	0.000	82.344	5.823
## TR2-28-S286	0.877	0.000	0.000	88.906	4.666
## TR2-3-S297	6.593	0.000	2.587	63.021	18.800
## TR2-31-S182	2.177	0.000	0.000	91.660	8.217
## TR2-34-S302	4.281	0.000	0.000	94.764	5.288
## TR2-37-S330	3.602	0.000	0.000	103.752	4.216
## TR2-40-S259	5.119	0.000	0.000	102.943	8.903
## TR2-46-S239	3.776	0.000	0.000	110.663	12.096
## TR2-52-S230	0.000	0.000	0.000	91.397	12.261
## TR2-58-S172	0.327	0.000	1.249	68.746	13.115
## TR2-64-S216	0.511	0.000	2.219	57.910	13.311
## TR4-1-S193	NA	NA	NA	NA	NA
## TR4-13-S142	0.623	0.000	0.000	89.036	13.196
## TR4-14-S226	0.748	0.000	0.000	94.132	13.831
## TR4-15-S218	0.621	0.000	0.000	101.441	14.850
## TR4-16-S276	0.742	0.000	0.000	95.815	13.114
## TR4-17-S114	4.792	0.000	0.000	79.243	17.005
## TR4-18-S200	8.744	0.000	0.000	57.244	21.131
## TR4-19-S270	11.605	0.000	0.000	48.991	21.902
## TR4-20-S269	10.699	0.000	10.349	46.502	23.092
## TR4-21-S254	10.796	0.000	9.618	47.637	24.239

## TR4-22-S344	10.667	0.000	0.000	44.945	22.242
## TR4-25-S333	8.354	0.000	0.000	39.160	17.485
## TR4-28-S183	7.903	0.000	0.000	37.823	14.292
## TR4-3-S309	4.884	0.000	0.000	74.419	16.121
## TR4-31-S278	NA	NA	NA	NA	NA
## TR4-34-S342	5.187	0.000	0.000	44.793	15.056
## TR4-37-S188	6.401	0.000	0.000	44.769	16.874
## TR4-40-S242	7.825	7.755	0.000	42.346	15.733
## TR4-46-S215	7.444	8.524	0.000	46.362	19.358
## TR4-52-S95	7.698	0.000	0.000	40.062	23.478
## TR4-58-S112	6.615	0.000	0.000	30.977	15.826
## TR4-64-S220	0.418	3.808	0.000	41.394	17.022
##	Isobutytrat_mM	Butytrat_mM	Isovalerat_mM	Valerat_mM	Total_SCFA_mM
## IR1-16-S307	6.315	35.967	7.097	6.126	141.181
## IR1-17-S279	6.502	42.810	6.828	5.438	146.814
## IR1-18-S287	6.518	41.377	7.063	5.312	143.737
## IR1-2-S96	1.011	32.783	0.986	5.139	112.703
## IR1-24-S295	6.740	43.375	7.831	5.631	154.844
## IR1-26-S119	7.425	42.255	7.986	7.521	156.229
## IR1-3-S320	5.111	39.518	7.536	6.546	146.922
## IR1-36-S159	6.892	41.525	6.992	8.255	159.325
## IR1-37-S343	4.273	20.076	3.437	2.288	101.804
## IR1-38-S337	4.210	14.028	2.306	1.122	94.876
## IR1-39-S351	0.000	9.521	1.415	0.477	80.700
## IR1-4-S223	6.540	37.590	8.385	7.366	161.216
## IR1-43-S256	7.196	27.685	4.619	0.000	142.894
## IR1-44-S264	6.771	27.800	4.159	1.947	136.620
## IR1-45-S128	NA	NA	NA	NA	NA
## IR1-48-S339	9.553	47.429	4.358	6.721	149.323
## IR1-54-S130	9.046	41.833	5.919	6.912	142.132
## IR1-57-S356	5.339	39.561	4.819	6.555	134.853
## IR1-6-S250	6.863	34.543	7.530	6.715	165.291
## IR1-63-S155	6.156	39.345	5.694	6.666	142.015
## IR1-69-S198	6.546	40.828	5.852	8.191	152.899
## IR1-77-S202	10.539	40.389	3.007	7.588	154.198
## IR1-8-S260	6.830	31.547	7.009	4.427	150.791
## TR2-1-S273	NA	NA	NA	NA	NA
## TR2-13-S231	7.367	41.719	6.875	6.376	172.170
## TR2-14-S232	7.782	43.157	6.980	7.847	172.179
## TR2-15-S288	8.776	44.333	6.422	7.313	178.886
## TR2-16-S184	7.596	44.129	5.802	6.606	177.081
## TR2-17-S248	7.794	47.890	6.038	3.410	173.501
## TR2-18-S326	6.547	47.253	3.761	1.469	167.134
## TR2-19-S318	0.000	44.651	2.036	0.036	148.110
## TR2-20-S271	0.000	48.862	3.874	0.570	139.691
## TR2-21-S228	0.000	41.240	1.044	0.000	136.326
## TR2-22-S364	0.000	43.389	1.149	0.000	136.604
## TR2-25-S133	0.000	40.410	1.342	0.000	132.995
## TR2-28-S286	0.000	44.515	1.109	0.000	140.073
## TR2-3-S297	6.150	45.191	7.968	3.384	153.694
## TR2-31-S182	5.115	45.407	4.247	0.000	156.823
## TR2-34-S302	0.000	39.231	1.511	0.000	145.075
## TR2-37-S330	1.411	39.604	1.355	0.000	153.940
## TR2-40-S259	0.000	35.693	4.456	0.000	157.114

## TR2-46-S239	5.428	44.934	6.609	0.000	183.506
## TR2-52-S230	8.766	43.145	5.232	0.000	160.801
## TR2-58-S172	10.398	52.683	7.211	0.338	154.067
## TR2-64-S216	7.440	35.756	6.925	0.233	124.305
## TR4-1-S193	NA	NA	NA	NA	NA
## TR4-13-S142	7.595	36.478	6.940	8.164	162.032
## TR4-14-S226	8.933	34.897	6.840	8.443	167.824
## TR4-15-S218	7.813	33.872	6.542	8.752	173.891
## TR4-16-S276	8.162	37.582	6.557	8.358	170.330
## TR4-17-S114	8.207	28.479	6.182	4.307	148.215
## TR4-18-S200	5.169	14.109	5.840	1.585	113.822
## TR4-19-S270	4.715	6.737	5.970	0.436	100.356
## TR4-20-S269	4.802	3.750	5.741	0.000	104.935
## TR4-21-S254	0.000	1.522	5.250	0.000	99.062
## TR4-22-S344	6.994	2.367	5.154	0.000	92.369
## TR4-25-S333	5.935	2.601	5.816	0.000	79.351
## TR4-28-S183	5.811	2.036	4.958	0.000	72.823
## TR4-3-S309	6.230	45.385	8.218	3.351	158.608
## TR4-31-S278	NA	NA	NA	NA	NA
## TR4-34-S342	4.904	0.634	4.836	0.000	75.410
## TR4-37-S188	4.021	0.450	6.832	0.000	79.347
## TR4-40-S242	4.230	0.000	6.867	0.000	77.001
## TR4-46-S215	4.941	0.287	7.161	0.000	85.553
## TR4-52-S95	12.070	0.000	3.823	0.000	87.131
## TR4-58-S112	0.000	0.994	5.581	0.000	59.993
## TR4-64-S220	5.820	2.230	4.591	0.000	71.475

```
ps_poly %>%
  saveRDS("~/Documents/GitHub/DivComAnalyses/data-raw/ps_PolyFermS.RDS")
```

## Invivo:

```
"~/Documents/GitHub/mIMT/data/physeq_silva132_clean_phangorn_tree_NAin.RDS" %>%
  readRDS() %>%
  subset_samples(sample_type %in% c("Feces", "Cecum")) %>%
  subset_samples(!treatment %in% c("InoculumFermenter_slurry", "InoculumFermenter", "Caecal_inoculum_F6")) %>%
  subset_samples(!is.na(treatment)) %>%
  subset_samples(!is.na(day)) %>%
  subset_samples(remove != "x") %>% #sample_data() %>% data.frame()
  subset_samples(tabled > 500) %>%
  filter_taxa(function(x) sum(x > 0) > 0, TRUE) -> physeq
```

```
sample_data(physeq)$treatment = factor(sample_data(physeq)$treatment,
                                       levels = c("H2O", "H2O_co",
                                                  "Eubiotic",
                                                  "Normobiotic",
                                                  "Dysbiotic",
                                                  "DSS", "DSS_co",
                                                  "Predni"))

sample_data(physeq)$sample_type = factor(sample_data(physeq)$sample_type,
                                       levels = c("Feces",
                                                  "Cecum"))
```

```

sample_data(physeq)$day = factor(sample_data(physeq)$day,
                                levels = c("Day_-1",
                                             "Day_6",
                                             "Day_12",
                                             "Day_14"))

sample_data(physeq)$treatment_grouped <- factor(ifelse(sample_data(physeq)$treatment == "DSS_co", "DSS",
                                                         ifelse(sample_data(physeq)$treatment == "H2O_co",
                                                                    as.vector(sample_data(physeq)$treatment)),
                                                         levels = c("H2O",
                                                                    "Eubiotic",
                                                                    "Normobiotic",
                                                                    "Dysbiotic",
                                                                    "DSS",
                                                                    "Predni")))

sample_data(physeq)$treatment_invivo <- factor(ifelse(sample_data(physeq)$treatment_grouped %in% c("H2O",
                                                                                               "none",
                                                                                               as.vector(sample_data(physeq)$treatment_grouped)),
                                                                                               levels = c("none",
                                                                                               "Eubiotic",
                                                                                               "Normobiotic",
                                                                                               "Dysbiotic",
                                                                                               "DSS",
                                                                                               "Predni")))

sample_data(physeq)$day_num <- as.numeric(parse_number(as.character(sample_data(physeq)$day)))

tax_table(physeq) <- tax_table(physeq)[,-8]

physeq %>%
  subset_samples(sample_type == "Feces" &
                 experiment == "mIMT_2" &
                 treatment %in% c("Eubiotic",
                                   "Dysbiotic",
                                   "DSS")) -> ps_invivo

sample_names(ps_invivo) <- sample_data(ps_invivo)$Sample

ps_invivo %>%
  sample_data() %>%
  data.frame() %>%
  select(-reads, -remove, -experiment, -owner, -run, -region_1, -responsible_seq, -facility, -sample_type)
  select(Sample, everything()) %>%
  mutate(treatment_invivo = recode(treatment_invivo,
                                   `Eubiotic` = "TreatA",
                                   `Dysbiotic` = "TreatB",
                                   `DSS` = "TreatC"),
         treatment = recode(treatment,
                              `Eubiotic` = "TreatA",
                              `Dysbiotic` = "TreatB",
                              `DSS` = "TreatC")) -> sample_data(ps_invivo)

```

```
ps_invivo %>%
  sample_data() %>%
  data.frame()
```

##	Sample	input	filtered	filtered_pc	denoisedF	denoisedR	denoisedF_pc
##	S_219	S_219	44852	44233	0.99	42985	43681
##	S_220	S_220	72545	72048	0.99	70726	70818
##	S_221	S_221	76560	76051	0.99	74773	75012
##	S_222	S_222	62479	62192	1.00	61528	61201
##	S_223	S_223	78944	78670	1.00	77717	77643
##	S_224	S_224	72930	72622	1.00	71294	71600
##	S_225	S_225	194545	193572	0.99	191373	191090
##	S_226	S_226	62034	61405	0.99	60035	60599
##	S_227	S_227	77255	76602	0.99	75092	75664
##	S_228	S_228	58784	58444	0.99	57469	57504
##	S_229	S_229	65923	65701	1.00	64821	65102
##	S_230	S_230	51065	50870	1.00	50385	50108
##	S_231	S_231	123400	123134	1.00	122255	122251
##	S_232	S_232	60612	60294	0.99	59542	59544
##	S_233	S_233	66974	66745	1.00	65951	65893
##	S_234	S_234	59225	58828	0.99	57814	57973
##	S_251	S_251	46134	45771	0.99	44977	45491
##	S_252	S_252	43200	42935	0.99	41926	42309
##	S_253	S_253	61771	61392	0.99	60360	60789
##	S_254	S_254	52064	51842	1.00	51293	51367
##	S_255	S_255	60985	60720	1.00	60048	60142
##	S_256	S_256	58725	58433	1.00	57619	57826
##	S_257	S_257	53218	52990	1.00	52344	52408
##	S_267	S_267	40629	40017	0.98	37962	39383
##	S_268	S_268	67522	67104	0.99	65052	65909
##	S_269	S_269	62759	62323	0.99	60618	61516
##	S_270	S_270	51923	51673	1.00	50793	51026
##	S_271	S_271	67574	67308	1.00	66518	66567
##	S_272	S_272	69843	69434	0.99	68180	68564
##	S_273	S_273	53162	52908	1.00	52171	52277
##	S_274	S_274	89399	88860	0.99	86777	87744
##	S_275	S_275	47024	46664	0.99	46031	46150
##	S_276	S_276	52772	52491	0.99	51730	51714
##	S_277	S_277	57920	57707	1.00	56978	56801
##	S_278	S_278	45769	45629	1.00	45263	44921
##	S_279	S_279	69581	69393	1.00	68667	68504
##	S_280	S_280	51654	51454	1.00	50897	50887
##	S_281	S_281	47303	47147	1.00	46707	46496
##	S_298	S_298	45576	45320	0.99	44563	44714
##	S_299	S_299	37551	37094	0.99	36164	36676
##	S_300	S_300	49047	48750	0.99	47852	48161
##	S_301	S_301	55629	55307	0.99	54626	54653
##	S_302	S_302	39112	38954	1.00	38658	38534
##	S_303	S_303	56158	55984	1.00	54978	55559
##	S_304	S_304	56174	55990	1.00	54558	55582
##	S_313	S_313	51990	51826	1.00	51343	51218
##	S_315	S_315	56389	56103	0.99	55311	55282
##	S_316	S_316	52602	52284	0.99	51592	51797

##	S_317	S_317	55353	55045	0.99	54304	54490	0.99
##	S_318	S_318	47228	47005	1.00	46369	46415	0.99
##	S_319	S_319	51051	50825	1.00	50302	50300	0.99
##	S_320	S_320	50339	50129	1.00	49527	49544	0.99
##	S_321	S_321	53955	53733	1.00	53035	53076	0.99
##	S_322	S_322	50561	50357	1.00	49892	49982	0.99
##	S_323	S_323	55667	55424	1.00	54749	54623	0.99
##	S_324	S_324	53070	52783	0.99	52078	52396	0.99
##	S_325	S_325	43764	43485	0.99	42777	43048	0.98
##	S_326	S_326	55187	55049	1.00	54210	54461	0.98
##	S_327	S_327	44766	44572	1.00	44063	44115	0.99
##	S_341	S_341	51618	51384	1.00	50750	50912	0.99
##	S_342	S_342	38695	38576	1.00	38190	38209	0.99
##	S_343	S_343	31639	31476	0.99	31038	31086	0.99
##	S_344	S_344	57314	57167	1.00	56524	56611	0.99
##	S_345	S_345	26796	26719	1.00	26323	26354	0.99
##	S_346	S_346	42867	42762	1.00	42236	42312	0.99
##	S_347	S_347	49591	49374	1.00	48708	48943	0.99
##	S_348	S_348	49706	49595	1.00	49100	49181	0.99
##	S_438	S_438	66744	66455	1.00	65323	65479	0.98
##	S_439	S_439	65688	65409	1.00	64553	64591	0.99
##	S_440	S_440	42282	42132	1.00	41655	41507	0.99
##	S_441	S_441	70679	70422	1.00	69786	69632	0.99
##	S_442	S_442	64149	63878	1.00	62852	63031	0.98
##	S_443	S_443	66106	65772	0.99	65139	65014	0.99
##	S_444	S_444	67344	67025	1.00	65804	66358	0.98
##	S_445	S_445	47094	46707	0.99	45473	46244	0.97
##	S_446	S_446	67572	67267	1.00	65981	66428	0.98
##	S_447	S_447	67255	66994	1.00	65937	66416	0.98
##	S_448	S_448	57626	57445	1.00	56882	56862	0.99
##	S_449	S_449	69800	69629	1.00	69042	68944	0.99
##	S_450	S_450	66731	66475	1.00	65494	65868	0.99
##	S_465	S_465	69793	69596	1.00	68933	69150	0.99
##	S_466	S_466	73792	73415	0.99	72195	72677	0.98
##	S_467	S_467	64707	64401	1.00	63506	63635	0.99
##	S_468	S_468	69869	69411	0.99	67836	68545	0.98
##	S_469	S_469	22876	22575	0.99	21552	22319	0.95
##	S_470	S_470	70853	70436	0.99	69010	69691	0.98
##	denoisedR_pc merged merged_pc tabled chimera_out length_filtered							
##	S_219		0.99	37694	0.88	37694	26929	26929
##	S_220		0.98	63881	0.90	63881	44125	44125
##	S_221		0.99	67904	0.91	67904	49814	49814
##	S_222		0.98	54905	0.89	54905	42532	42532
##	S_223		0.99	68254	0.88	68254	49859	49859
##	S_224		0.99	60502	0.85	60502	44187	44187
##	S_225		0.99	173270	0.91	173270	124781	124781
##	S_226		0.99	53780	0.90	53780	39110	39110
##	S_227		0.99	65965	0.88	65965	47209	47209
##	S_228		0.98	52534	0.91	52534	39238	39238
##	S_229		0.99	59729	0.92	59729	49569	49569
##	S_230		0.99	45226	0.90	45226	32999	32999
##	S_231		0.99	113946	0.93	113946	89836	89836
##	S_232		0.99	53809	0.90	53809	37806	37806
##	S_233		0.99	58534	0.89	58534	44726	44726



## S_234	0.99	52635	0.91	52635	37761	37761
## S_251	0.99	42248	0.94	42248	36121	36121
## S_252	0.99	37345	0.89	37345	27664	27664
## S_253	0.99	55612	0.92	55612	39123	39123
## S_254	0.99	47517	0.93	47517	34414	34414
## S_255	0.99	55956	0.93	55956	41213	41213
## S_256	0.99	53508	0.93	53508	39884	39884
## S_257	0.99	48415	0.92	48415	35603	35603
## S_267	0.98	33276	0.88	33276	25918	25918
## S_268	0.98	58828	0.90	58828	44286	44286
## S_269	0.99	55474	0.92	55474	41040	41040
## S_270	0.99	47109	0.93	47109	33787	33787
## S_271	0.99	62749	0.94	62749	49311	49311
## S_272	0.99	63342	0.93	63342	47625	47625
## S_273	0.99	48976	0.94	48976	38035	38035
## S_274	0.99	80614	0.93	80614	59937	59937
## S_275	0.99	42485	0.92	42485	30890	30890
## S_276	0.99	47698	0.92	47698	36986	36986
## S_277	0.98	52627	0.92	52627	40691	40691
## S_278	0.98	41374	0.91	41374	31897	31897
## S_279	0.99	64030	0.93	64030	47728	47728
## S_280	0.99	47420	0.93	47420	37306	37306
## S_281	0.99	43385	0.93	43385	32803	32803
## S_298	0.99	41344	0.93	41344	32872	32872
## S_299	0.99	32859	0.91	32859	25123	25123
## S_300	0.99	44429	0.93	44429	34215	34215
## S_301	0.99	50825	0.93	50825	39342	39342
## S_302	0.99	36206	0.94	36206	27584	27584
## S_303	0.99	51798	0.94	51798	36753	36753
## S_304	0.99	50705	0.93	50705	34090	34090
## S_313	0.99	48093	0.94	48093	38160	38160
## S_315	0.99	50234	0.91	50234	37273	37273
## S_316	0.99	48036	0.93	48036	35747	35747
## S_317	0.99	50207	0.92	50207	36364	36364
## S_318	0.99	43142	0.93	43142	32689	32689
## S_319	0.99	46711	0.93	46711	35016	35016
## S_320	0.99	45769	0.92	45769	33891	33891
## S_321	0.99	48984	0.92	48984	35926	35926
## S_322	0.99	47055	0.94	47055	33868	33868
## S_323	0.99	50335	0.92	50335	38224	38224
## S_324	0.99	49621	0.95	49621	41368	41368
## S_325	0.99	39705	0.93	39705	29213	29213
## S_326	0.99	49886	0.92	49886	37943	37943
## S_327	0.99	41415	0.94	41415	33353	33353
## S_341	0.99	47667	0.94	47667	37388	37388
## S_342	0.99	36114	0.95	36114	30253	30253
## S_343	0.99	28431	0.92	28431	22578	22578
## S_344	0.99	52379	0.93	52379	41121	41121
## S_345	0.99	23818	0.90	23818	18120	18120
## S_346	0.99	38771	0.92	38771	30174	30174
## S_347	0.99	45983	0.94	45983	34059	34059
## S_348	0.99	46988	0.96	46988	36536	36536
## S_438	0.99	60561	0.93	60561	52584	52584
## S_439	0.99	60150	0.93	60150	50751	50751

## S_440	0.99	38560	0.93	38560	33283	33283
## S_441	0.99	66477	0.95	66477	58699	58699
## S_442	0.99	60377	0.96	60377	58881	58881
## S_443	0.99	61479	0.94	61479	50758	50758
## S_444	0.99	63124	0.96	63124	60863	60863
## S_445	0.99	42723	0.94	42723	36375	36375
## S_446	0.99	61694	0.94	61694	50918	50918
## S_447	0.99	63155	0.96	63155	58042	58042
## S_448	0.99	54043	0.95	54043	46975	46975
## S_449	0.99	65940	0.96	65940	57531	57531
## S_450	0.99	62165	0.95	62165	53894	53894
## S_465	0.99	67008	0.97	67008	63618	63618
## S_466	0.99	68679	0.95	68679	60000	60000
## S_467	0.99	59847	0.94	59847	49010	49010
## S_468	0.99	63359	0.93	63359	53096	53096
## S_469	0.99	19263	0.89	19263	15459	15459
## S_470	0.99	65289	0.95	65289	57063	57063
##	tabled_pc	chimera_out_pc	length_filtered_pc	Fermentation	day	treatment
## S_219	1	0.71	1	<NA>	Day_-1	TreatA
## S_220	1	0.69	1	<NA>	Day_-1	TreatA
## S_221	1	0.73	1	<NA>	Day_-1	TreatA
## S_222	1	0.77	1	<NA>	Day_-1	TreatA
## S_223	1	0.73	1	<NA>	Day_-1	TreatA
## S_224	1	0.73	1	<NA>	Day_-1	TreatA
## S_225	1	0.72	1	<NA>	Day_-1	TreatA
## S_226	1	0.73	1	<NA>	Day_-1	TreatA
## S_227	1	0.72	1	<NA>	Day_-1	TreatB
## S_228	1	0.75	1	<NA>	Day_-1	TreatB
## S_229	1	0.83	1	<NA>	Day_-1	TreatB
## S_230	1	0.73	1	<NA>	Day_-1	TreatB
## S_231	1	0.79	1	<NA>	Day_-1	TreatB
## S_232	1	0.70	1	<NA>	Day_-1	TreatB
## S_233	1	0.76	1	<NA>	Day_-1	TreatB
## S_234	1	0.72	1	<NA>	Day_-1	TreatB
## S_251	1	0.85	1	<NA>	Day_-1	TreatC
## S_252	1	0.74	1	<NA>	Day_-1	TreatC
## S_253	1	0.70	1	<NA>	Day_-1	TreatC
## S_254	1	0.72	1	<NA>	Day_-1	TreatC
## S_255	1	0.74	1	<NA>	Day_-1	TreatC
## S_256	1	0.75	1	<NA>	Day_-1	TreatC
## S_257	1	0.74	1	<NA>	Day_-1	TreatC
## S_267	1	0.78	1	<NA>	Day_12	TreatA
## S_268	1	0.75	1	<NA>	Day_12	TreatA
## S_269	1	0.74	1	<NA>	Day_12	TreatA
## S_270	1	0.72	1	<NA>	Day_12	TreatA
## S_271	1	0.79	1	<NA>	Day_12	TreatA
## S_272	1	0.75	1	<NA>	Day_12	TreatA
## S_273	1	0.78	1	<NA>	Day_12	TreatA
## S_274	1	0.74	1	<NA>	Day_12	TreatB
## S_275	1	0.73	1	<NA>	Day_12	TreatB
## S_276	1	0.78	1	<NA>	Day_12	TreatB
## S_277	1	0.77	1	<NA>	Day_12	TreatB
## S_278	1	0.77	1	<NA>	Day_12	TreatB
## S_279	1	0.75	1	<NA>	Day_12	TreatB

## S_280	1	0.79	1	<NA>	Day_12	TreatB
## S_281	1	0.76	1	<NA>	Day_12	TreatB
## S_298	1	0.80	1	<NA>	Day_12	TreatC
## S_299	1	0.76	1	<NA>	Day_12	TreatC
## S_300	1	0.77	1	<NA>	Day_12	TreatC
## S_301	1	0.77	1	<NA>	Day_12	TreatC
## S_302	1	0.76	1	<NA>	Day_12	TreatC
## S_303	1	0.71	1	<NA>	Day_12	TreatC
## S_304	1	0.67	1	<NA>	Day_12	TreatC
## S_313	1	0.79	1	<NA>	Day_14	TreatA
## S_315	1	0.74	1	<NA>	Day_14	TreatA
## S_316	1	0.74	1	<NA>	Day_14	TreatA
## S_317	1	0.72	1	<NA>	Day_14	TreatA
## S_318	1	0.76	1	<NA>	Day_14	TreatA
## S_319	1	0.75	1	<NA>	Day_14	TreatA
## S_320	1	0.74	1	<NA>	Day_14	TreatB
## S_321	1	0.73	1	<NA>	Day_14	TreatB
## S_322	1	0.72	1	<NA>	Day_14	TreatB
## S_323	1	0.76	1	<NA>	Day_14	TreatB
## S_324	1	0.83	1	<NA>	Day_14	TreatB
## S_325	1	0.74	1	<NA>	Day_14	TreatB
## S_326	1	0.76	1	<NA>	Day_14	TreatB
## S_327	1	0.81	1	<NA>	Day_14	TreatB
## S_341	1	0.78	1	<NA>	Day_14	TreatC
## S_342	1	0.84	1	<NA>	Day_14	TreatC
## S_343	1	0.79	1	<NA>	Day_14	TreatC
## S_344	1	0.79	1	<NA>	Day_14	TreatC
## S_345	1	0.76	1	<NA>	Day_14	TreatC
## S_346	1	0.78	1	<NA>	Day_14	TreatC
## S_347	1	0.74	1	<NA>	Day_14	TreatC
## S_348	1	0.78	1	<NA>	Day_14	TreatC
## S_438	1	0.87	1	<NA>	Day_6	TreatA
## S_439	1	0.84	1	<NA>	Day_6	TreatA
## S_440	1	0.86	1	<NA>	Day_6	TreatA
## S_441	1	0.88	1	<NA>	Day_6	TreatA
## S_442	1	0.98	1	<NA>	Day_6	TreatA
## S_443	1	0.83	1	<NA>	Day_6	TreatB
## S_444	1	0.96	1	<NA>	Day_6	TreatB
## S_445	1	0.85	1	<NA>	Day_6	TreatB
## S_446	1	0.83	1	<NA>	Day_6	TreatB
## S_447	1	0.92	1	<NA>	Day_6	TreatB
## S_448	1	0.87	1	<NA>	Day_6	TreatB
## S_449	1	0.87	1	<NA>	Day_6	TreatB
## S_450	1	0.87	1	<NA>	Day_6	TreatB
## S_465	1	0.95	1	<NA>	Day_6	TreatC
## S_466	1	0.87	1	<NA>	Day_6	TreatC
## S_467	1	0.82	1	<NA>	Day_6	TreatC
## S_468	1	0.84	1	<NA>	Day_6	TreatC
## S_469	1	0.80	1	<NA>	Day_6	TreatC
## S_470	1	0.87	1	<NA>	Day_6	TreatC
##	mouse_label	BW	BW_percent	BW_delta	DAI	treatment_grouped
## S_219	m_8	20.55	0.000000000	0.00	0	Eubiotic
## S_220	m_19	21.32	0.000000000	0.00	0	Eubiotic
## S_221	m_34	20.11	0.000000000	0.00	0	Eubiotic

## S_222	m_26	21.90	0.000000000	0.00	0	Eubiotic
## S_223	m_39	20.94	0.000000000	0.00	0	Eubiotic
## S_224	m_46	21.12	0.000000000	0.00	0	Eubiotic
## S_225	m_48	20.35	0.000000000	0.00	0	Eubiotic
## S_226	m_56	20.51	0.000000000	0.00	0	Eubiotic
## S_227	m_29	20.95	0.000000000	0.00	0	Dysbiotic
## S_228	m_13	20.35	0.000000000	0.00	0	Dysbiotic
## S_229	m_18	21.55	0.000000000	0.00	0	Dysbiotic
## S_230	m_27	23.18	0.000000000	0.00	0	Dysbiotic
## S_231	m_32	20.78	0.000000000	0.00	0	Dysbiotic
## S_232	m_49	20.90	0.000000000	0.00	0	Dysbiotic
## S_233	m_54	19.70	0.000000000	0.00	0	Dysbiotic
## S_234	m_35	20.53	0.000000000	0.00	0	Dysbiotic
## S_251	m_7	20.98	0.000000000	0.00	0	DSS
## S_252	m_10	20.48	0.000000000	0.00	0	DSS
## S_253	m_11	20.47	0.000000000	0.00	0	DSS
## S_254	m_24	22.91	0.000000000	0.00	0	DSS
## S_255	m_28	21.30	0.000000000	0.00	0	DSS
## S_256	m_36	22.47	0.000000000	0.00	0	DSS
## S_257	m_51	21.92	0.000000000	0.00	0	DSS
## S_267	m_8	18.24	0.112408759	0.20	1	Eubiotic
## S_268	m_19	18.64	0.125703565	0.64	1	Eubiotic
## S_269	m_34	19.75	0.017901542	0.90	0	Eubiotic
## S_270	m_26	22.45	-0.025114155	-0.15	1	Eubiotic
## S_271	m_39	20.86	0.003820439	1.81	0	Eubiotic
## S_272	m_46	20.12	0.047348485	0.70	0	Eubiotic
## S_273	m_48	19.75	0.029484029	0.71	0	Eubiotic
## S_274	m_29	17.62	0.158949881	0.26	3	Dysbiotic
## S_275	m_13	17.60	0.135135135	0.05	3	Dysbiotic
## S_276	m_18	17.57	0.184686775	0.39	3	Dysbiotic
## S_277	m_27	20.47	0.116911130	-0.46	1	Dysbiotic
## S_278	m_32	17.32	0.166506256	0.24	3	Dysbiotic
## S_279	m_49	17.95	0.141148325	0.18	3	Dysbiotic
## S_280	m_54	17.25	0.124365482	0.20	3	Dysbiotic
## S_281	m_35	18.45	0.101315149	-0.10	3	Dysbiotic
## S_298	m_7	18.25	0.130123928	0.30	3	DSS
## S_299	m_10	17.35	0.152832031	0.25	3	DSS
## S_300	m_11	16.85	0.176844162	-0.01	4	DSS
## S_301	m_24	20.01	0.126582278	-0.35	2	DSS
## S_302	m_28	18.12	0.149295775	-0.05	3	DSS
## S_303	m_36	17.07	0.240320427	-0.19	4	DSS
## S_304	m_51	16.07	0.266879562	0.20	4	DSS
## S_313	m_19	21.13	0.008911820	1.32	0	Eubiotic
## S_315	m_34	21.03	-0.045748384	0.84	0	Eubiotic
## S_316	m_26	21.34	0.025570776	-0.85	0	Eubiotic
## S_317	m_39	22.88	-0.092645654	2.42	0	Eubiotic
## S_318	m_46	21.81	-0.032670455	0.59	0	Eubiotic
## S_319	m_48	21.31	-0.047174447	0.49	0	Eubiotic
## S_320	m_29	18.02	0.139856802	0.17	2	Dysbiotic
## S_321	m_13	18.23	0.104176904	0.38	2	Dysbiotic
## S_322	m_18	18.01	0.164269142	0.45	3	Dysbiotic
## S_323	m_27	20.95	0.096203624	0.94	0	Dysbiotic
## S_324	m_32	17.85	0.141000962	0.50	2	Dysbiotic
## S_325	m_49	18.35	0.122009569	0.23	2	Dysbiotic

## S_326	m_54	18.52	0.059898477	0.52	0	Dysbiotic
## S_327	m_35	18.95	0.076960546	0.41	0	Dysbiotic
## S_341	m_7	18.21	0.132030505	0.07	2	DSS
## S_342	m_10	17.58	0.141601563	-0.07	3	DSS
## S_343	m_11	17.65	0.137762579	0.09	2	DSS
## S_344	m_24	20.23	0.116979485	-0.40	3	DSS
## S_345	m_28	18.96	0.109859155	0.42	3	DSS
## S_346	m_36	18.02	0.198041834	0.80	3	DSS
## S_347	m_51	16.96	0.226277372	0.72	4	DSS
## S_348	m_55	18.02	0.121404193	0.06	2	DSS
## S_438	m_19	20.48	0.039399625	-0.93	1	Eubiotic
## S_439	m_26	20.35	0.070776256	-1.61	2	Eubiotic
## S_440	m_46	20.77	0.016571970	-0.49	1	Eubiotic
## S_441	m_48	19.90	0.022113022	-0.43	1	Eubiotic
## S_442	m_56	19.50	0.049244271	-1.12	1	Eubiotic
## S_443	m_29	21.32	-0.017661098	0.39	2	Dysbiotic
## S_444	m_13	20.59	-0.011793612	-0.79	1	Dysbiotic
## S_445	m_18	21.06	0.022737819	-1.04	1	Dysbiotic
## S_446	m_27	22.95	0.009922347	-0.21	0	Dysbiotic
## S_447	m_32	20.91	-0.006256015	-0.15	1	Dysbiotic
## S_448	m_49	20.41	0.023444976	-1.00	2	Dysbiotic
## S_449	m_54	19.93	-0.011675127	-0.86	1	Dysbiotic
## S_450	m_35	20.81	-0.013638578	-0.60	1	Dysbiotic
## S_465	m_7	20.98	0.000000000	-0.93	1	DSS
## S_466	m_10	20.42	0.002929687	-0.69	1	DSS
## S_467	m_11	19.93	0.026380068	-0.87	1	DSS
## S_468	m_24	23.81	-0.039284155	0.46	0	DSS
## S_469	m_28	20.73	0.026760563	-0.70	1	DSS
## S_470	m_36	21.79	0.030262572	-0.33	2	DSS
##	treatment_invivo	day_num				
## S_219	none	-1				
## S_220	none	-1				
## S_221	none	-1				
## S_222	none	-1				
## S_223	none	-1				
## S_224	none	-1				
## S_225	none	-1				
## S_226	none	-1				
## S_227	none	-1				
## S_228	none	-1				
## S_229	none	-1				
## S_230	none	-1				
## S_231	none	-1				
## S_232	none	-1				
## S_233	none	-1				
## S_234	none	-1				
## S_251	none	-1				
## S_252	none	-1				
## S_253	none	-1				
## S_254	none	-1				
## S_255	none	-1				
## S_256	none	-1				
## S_257	none	-1				
## S_267	TreatA	12				

## S_268	TreatA	12
## S_269	TreatA	12
## S_270	TreatA	12
## S_271	TreatA	12
## S_272	TreatA	12
## S_273	TreatA	12
## S_274	TreatB	12
## S_275	TreatB	12
## S_276	TreatB	12
## S_277	TreatB	12
## S_278	TreatB	12
## S_279	TreatB	12
## S_280	TreatB	12
## S_281	TreatB	12
## S_298	TreatC	12
## S_299	TreatC	12
## S_300	TreatC	12
## S_301	TreatC	12
## S_302	TreatC	12
## S_303	TreatC	12
## S_304	TreatC	12
## S_313	TreatA	14
## S_315	TreatA	14
## S_316	TreatA	14
## S_317	TreatA	14
## S_318	TreatA	14
## S_319	TreatA	14
## S_320	TreatB	14
## S_321	TreatB	14
## S_322	TreatB	14
## S_323	TreatB	14
## S_324	TreatB	14
## S_325	TreatB	14
## S_326	TreatB	14
## S_327	TreatB	14
## S_341	TreatC	14
## S_342	TreatC	14
## S_343	TreatC	14
## S_344	TreatC	14
## S_345	TreatC	14
## S_346	TreatC	14
## S_347	TreatC	14
## S_348	TreatC	14
## S_438	TreatA	6
## S_439	TreatA	6
## S_440	TreatA	6
## S_441	TreatA	6
## S_442	TreatA	6
## S_443	TreatB	6
## S_444	TreatB	6
## S_445	TreatB	6
## S_446	TreatB	6
## S_447	TreatB	6
## S_448	TreatB	6

```

## S_449          TreatB          6
## S_450          TreatB          6
## S_465          TreatC          6
## S_466          TreatC          6
## S_467          TreatC          6
## S_468          TreatC          6
## S_469          TreatC          6
## S_470          TreatC          6

ps_invivo %>%
  saveRDS("~/Documents/GitHub/DivComAnalyses/data-raw/ps_invivo.RDS")

sessionInfo()

## R version 4.1.2 (2021-11-01)
## Platform: x86_64-apple-darwin17.0 (64-bit)
## Running under: macOS Mojave 10.14.6
##
## Matrix products: default
## BLAS:   /Library/Frameworks/R.framework/Versions/4.1/Resources/lib/libRblas.0.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/4.1/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] stats      graphics  grDevices  utils      datasets  methods   base
##
## other attached packages:
## [1] phyloseq_1.36.0      forcats_0.5.1      stringr_1.4.0
## [4] dplyr_1.0.8          purrr_0.3.4        readr_2.1.2
## [7] tidyr_1.2.0          tibble_3.1.6       ggplot2_3.3.5
## [10] tidyverse_1.3.1.9000
##
## loaded via a namespace (and not attached):
## [1] nlme_3.1-155          bitops_1.0-7        fs_1.5.2
## [4] lubridate_1.8.0       httr_1.4.2          GenomeInfoDb_1.28.4
## [7] tools_4.1.2          backports_1.4.1     vegan_2.5-7
## [10] utf8_1.2.2           R6_2.5.1            mgcv_1.8-38
## [13] DBI_1.1.2            BiocGenerics_0.38.0 colorspace_2.0-2
## [16] permute_0.9-7         rhdf5filters_1.4.0  ade4_1.7-18
## [19] withr_2.4.3          tidysselect_1.1.1   compiler_4.1.2
## [22] cli_3.2.0            rvest_1.0.2         Biobase_2.52.0
## [25] xml2_1.3.3           scales_1.1.1        digest_0.6.29
## [28] rmarkdown_2.13       XVector_0.32.0      pkgconfig_2.0.3
## [31] htmltools_0.5.2      dbplyr_2.1.1        fastmap_1.1.0
## [34] rlang_1.0.1          readxl_1.3.1        rstudioapi_0.13
## [37] generics_0.1.2       jsonlite_1.7.3      RCurl_1.98-1.6
## [40] magrittr_2.0.2       GenomeInfoDbData_1.2.6 biomformat_1.20.0
## [43] Matrix_1.4-0         Rcpp_1.0.8          munsell_0.5.0
## [46] S4Vectors_0.30.2     Rhdf5lib_1.14.2     fansi_1.0.2
## [49] ape_5.6-1            lifecycle_1.0.1     stringi_1.7.6
## [52] yaml_2.2.2           MASS_7.3-55         zlibbioc_1.38.0
## [55] rhdf5_2.36.0         plyr_1.8.6          grid_4.1.2
## [58] parallel_4.1.2       crayon_1.5.0        lattice_0.20-45

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## [61] splines_4.1.2	Biostrings_2.60.2	haven_2.4.3
## [64] multtest_2.48.0	hms_1.1.1	knitr_1.37
## [67] pillar_1.7.0	igraph_1.2.11	reshape2_1.4.4
## [70] codetools_0.2-18	stats4_4.1.2	reprex_2.0.1
## [73] glue_1.6.1	evaluate_0.14	data.table_1.14.2
## [76] modelr_0.1.8	vctrs_0.3.8	tzdb_0.2.0
## [79] foreach_1.5.2	cellranger_1.1.0	gtable_0.3.0
## [82] assertthat_0.2.1	xfun_0.30	broom_0.7.12
## [85] survival_3.2-13	iterators_1.0.14	IRanges_2.26.0
## [88] cluster_2.1.2	ellipsis_0.3.2	