

# Example Data Management Plan – complete version with full responses

## Investigating biochemical and structural changes to brain white matter in ageing rodents following immune challenge



### Data Stewardship Wizard (DSW) Example Data Management Plan

Complete version with full  
responses

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### (Q1) Proposal name

Investigating biochemical and structural changes to brain white matter in ageing rodents following immune challenge

### (Q2) Description of the data: Type of study

This study is a mixed methods study using confocal microscopy, fluorescent activated cell sorting (FACS), and proteomics to investigate the effects of ageing on white matter integrity in a mouse model.

### (Q3) Description of the data: Types of data

We will collect the following types of quantitative data: confocal imaging, FACS and proteomics. We will also generate associated research records, metadata, protocols, scripts for image analysis, and other forms of documentation.

### (Q4) Description of the data: Origin of the data

This study will generate new primary data. We will use existing related datasets from published literature within the field where possible for comparison and verification of findings.

### (Q5) Description of the data: Format and scale of the data

Power calculations indicate we will require approximately 12 (6 male, 6 female) mice for confocal microscopy (1 hemi-brain) and FACS (1 hemi-brain) experiments at both 'young' (4 months) and 'old' (12 months) time points for both sham and immune-challenged groups (48 mice total). For proteomics experiments, we will use 8 mice (4M, 4F) at each time point for each treatment condition (32 mice total). These numbers form the basis for calculating the scale of data as outlined below.

Confocal imaging: data will be generated and stored in raw .czi format for analysis and converted to .tiff format for publication. Image stacks will contain ~50 slices per mouse. Based on initial pilot studies we conservatively estimate that imaging files will generate approximately 12 TB of data.

FACS: data will be generated and stored in .fcs (3.2) and .csv file formats. It is estimated that 50000 events will generate

approximately 10 MB of data therefore the approximate volume of FACS data will be ~120 MB.

Proteomics: data will be stored as .raw and .mzXML files and conservative estimates of approximately 3-4 GB per sample will result in ~ 24-32 GB of data

## **(Q6) Managing, storing and curating data**

Data will be collected and managed in line with the following: the University [Research Data Management / Research Integrity Policy], the BBSRC Safeguarding Good Scientific Practice statement, and the principles of Good Laboratory Practice, in addition to local institutional and facility policies and SOPs. All data and associated documentation will be stored on the [institutional data storage]. This is a secure, enterprise-class networked storage system with disaster recovery mechanisms in place, such as multi-site backup and 60-day data recovery.

All data will be stored within a project folder containing sub-folders for each dataset and access will be limited to named individuals working on the project. A consistent file-naming strategy will be established within the group at the outset of the project to allow for efficient organisation and ongoing data curation.

## **(Q7) Metadata standards and data documentation**

We will ensure that research data is documented to the highest standards throughout the project to ensure transparency and reproducibility and to comply with the BBSRC Data Sharing Policy. All experimental details and protocols will be recorded using an Electronic Lab Notebook (ELN), allowing for robust version control and, where possible, direct integration with the instruments generating the data to ensure maximal recording of metadata. For imaging data, we will use the REMBI (Recommended Metadata for Biological Images) standards to capture all relevant metadata throughout the acquisition and analysis stages. Flow cytometry data will utilise the MIFlowCyt (Minimum Information about a Flow Cytometry experiment) metadata standards. Proteomics data will be recorded using the MIAPE (Minimum Information About a Proteomics Experiment) metadata standards. These three metadata standards are all well-established within the respective fields and are therefore the most appropriate to use in this study.

## **(Q8) Data preservation strategy and**

## **standards**

All data and associated metadata and documentation will be stored in standard machine-readable formats for long-term preservation. In line with the BBSRC Data Sharing Policy, all data will be retained for a minimum of ten years following study completion. Data will be archived for long-term preservation using [institutional data repository or 'cold storage']. Data will be retained in raw file formats. In the case where data exists in proprietary formats (e.g., imaging data) we will also convert this to a standard open format (such as .tiff) to ensure long-term preservation, machine operability and enable maximal reuse by others. Data will be deposited in a data repository and openly shared with others at the point of publication.

## **(Q9) Where will data be shared?**

All data will be curated using repository guidance and will include associated metadata, scripts, protocols and documentation. Imaging data will be deposited in BioImage Archive, FACS data will be deposited in FlowRepository and proteomics data will be deposited in PRIDE. Notes will be included within a data deposit to point to associated data from the project within alternative repositories and where possible DOIs for linked data deposits will be included. We will include a Data Access Statement within all publications arising from the work.

## **(Q10) When will data be available?**

Data will be made freely available in the open-access data repositories outlined above following the publication of results to ensure full transparency and maximal reuse by others.

## **(Q11) How will data be made findable and accessible?**

As described above, data will be deposited in open-access data repositories and made available at the point of publication in an open-access journal(s) enabling accessibility to any interested parties. We will include a Data Access Statement within all publications arising from the work. Results will be presented at local and international conferences. We will also engage with the University Communications and Press Office departments to promote research findings via social media or a press release.

## **(Q12) How will data be made reusable?**

All raw data and associated metadata will be made available as outlined above at the point of publication.

Data will be available in open formats wherever possible to ensure maximal reuse by both humans and machines.

### **(Q13) Restrictions or delays to sharing, with planned actions to limit such restrictions**

We reserve the right to retain unpublished data until sufficient validation has been conducted to allow meaningful and robust analysis. We do not anticipate any delays to data sharing following publication; however, we reserve the right to a restricted and appropriate period of exclusive use where required to protect potential Intellectual Property rights.

### **(Q14) Secondary use**

Data will be freely available and of interest to researchers working within the field or related fields. This will allow the wider research community to utilise the datasets for the validation of findings or entirely new purposes.

### **(Q15) Formal information/data security standards**

The project will be carried out in line with University and BBSRC policies and standards. All researchers working on the project will have already completed or will undertake Information Security training and will comply with the University Information Security Policy.

### **(Q16) Main risks to data security**

This study uses mouse models and does not incorporate any human data. In this project, the main risk to data security is data loss, which is mitigated by our use of the secure [institutional data storage] as described above in addition to our robust data management systems and processes.

### **(Q17) Capabilities**

The University has a Research Data Management Policy and secure data storage infrastructure to allow efficient and optimised research data management. All costs for data storage have been included in this application based on the estimated volume of 13 TB. We do not anticipate incurring any additional costs.

### **(Q18) Maintaining and implementing the Data Management Plan**

This data management plan is a living document and will be reviewed every 6 months to ensure the project is on track and to revise if necessary.

### **(Q19) Environmental considerations**

The University is a signatory of the Concordat for the Environmental Sustainability of Research and Innovation Practice and is committed to being net zero by 2040. We will engage with the University Sustainability Department to ensure that our laboratory space and working practices are as environmentally sustainable as possible. We will minimise our use of disposable laboratory plastics and endeavour to use reusable alternatives wherever possible. We will ensure no electrical equipment remains switched on overnight. In addition, we will ensure members of the research group spend time on appropriate sustainability training and implementing sustainable research practices.

### **(Q20) Responsibilities**

Study-wide data management and metadata creation is the responsibility of the project leader and associated researchers working on the project. Quality assurance of the data is the responsibility of every researcher working on the project. Responsibility for day-to-day data security lies with the project lead and research team; wider responsibility for the integrity and security of [institutional data storage] and associated infrastructure lies with the University Information Services and Information Security teams.