Plan Overview

A Data Management Plan created using DMPonline

Title: Experimental research project

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Funder: Swedish Research Council

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Project abstract:

It has become evident that the actin cytoskeleton functions both in the cytoplasm and nucleus. The Wiskott-Aldrich syndrome protein (WASp) family coordinate receptor signalling to changes in the actin cytoskeleton thereby regulating cell movement, cell-to-cell communication, and gene expression. The importance of actin dynamics in immune cells is revealed in severe primary immunodeficiency diseases with high incidence of tumors and autoimmunity caused by loss-of-function or gain-of-function mutations in WASp. This reveals that WASp activity needs to be strictly regulated for correct function of immune cells. The understanding of WASp in the nucleus is in its infancy and raises several outstanding questions; Does WASp act as a scaffold protein for RNA polymerase transcription? Does WASp signal in the nucleus? Is the capacity to polymerize actin required for nuclear function? We hypothesize that a dynamic actin cytoskeleton in the nucleus allows for precise movement of DNA and chromosomes over large distances. We will examine B cells that during an infection diversify the B cell receptor in germinal centers, a process that ultimately rely on massive proliferation, DNA repair over large distances, and chromatin remodelling. The overall goal is to reveal how nuclear WASp activity maintains genome integrity and prevents B cell transformation and to provide novel explanations and treatment strategies for primary immunodeficiency disease and B cell lymphoma.

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Experimental research project

General Information

Project Title

From mechanosensing to nuclear response: revealing the role of actin regulators for B cell diversification

Project Leader

Lisa Westerberg

Registration number at the Swedish Research Council

2020-02779

Version

1

Date

2025-01-01

Description of data – reuse of existing data and/or production of new data

How will data be collected, created or reused?

The experimental data will be collected throughout the project using state of the art requirements for the type of data analysed. All raw/unprocessed data is stored and accessible for at least 10 years upon collection according to the requirements for academia based research and following Karolinska Institutet guidelines. Data will be created, used, and reused throughout the project. Upon publication of papers, data will be shared with the community based on databases (European Genome-phenome Archive, EGA) and by applying to standard requirements for flow cytometry and imaging data as required by the journals.

What types of data will be created and/or collected, in terms of data format and amount/volume of data?

Flow cytometry data, Imaging data, RNA/DNA sequencing data - possible to share via cloud based services such as Onedrive currently used by Karolinska Institutet. Data will be largely in GBs and may extend to TBs size. The format of the data will be according to standard format where possible (eg .txt, .tiff, .fsc). Where specific formatting is required because of specific infrastructure/techniques used, the data can be converted to widely applicable format.

Documentation and data quality

How will the material be documented and described, with associated metadata relating to structure, standards and format for descriptions of the content, collection method, etc.?

All data is stored based on date of collection and with an experimental name. Data files are combined with written notes of experimental plan using the same date and experimental name.

How will data quality be safeguarded and documented (for example repeated measurements, validation of data input, etc.)?

Data capture, metadata production, data quality, storage and backup, data archiving & data sharing is performed by the responsible person in the project and supervised by the PI, Lisa Westerberg.
Specific collection of data: For all deep sequencing, we will sequence at least 3 biological replicates for statistical evaluation. For in vitro experiments, we will repeat an experiment at least three times using triplicates of each sample, and for in vivo we will use experimental groups of n=6-10 mice per genotype or condition and with 2-3 repeats of a set of experiment. We will compare data between different experimental groups using Student’s t-test, ANOVA, or other non-parametric methods using GraphPad Prism (GraphPad Software Inc.) or similar. For large in vivo experiments, the data is analyzed by ROUT (Q = 1.0%) and outliers excluded. P values with 95% confidence interval will be considered significant. P values will designed: *P < 0.05; **P < 0.01; ***P < 0.001.

Storage and backup

How is storage and backup of data and metadata safeguarded during the research process?

All data is stored at cloud based servers with automatic backup provided by the Karolinska Institutet IT department, currently OneDrive. All computers and servers used for data handling and storage are run by the Karolinska Institutet IT department. NAISS storage project is used for large data sets. All data is also backed up at external hard drives.

How is data security and controlled access to data safeguarded, in relation to the handling of sensitive data and personal data, for example?

All data collected will be stored and accessible for at least 10 years. We work with pseudonymised samples only; patient samples are decoded by the caring doctors according to the GDPR rules such that the persons in the Lisa Westerberg lab working with the samples can't identify the patient(s). IPR will be handled according to Karolinska Institutet's handling of IPR data. Access to the data/documentation is restricted to group members only.

Legal and ethical aspects

How is data handling according to legal requirements safeguarded, e.g. in terms of handling of personal data, confidentiality and intellectual property rights?

We follow Karolinska Institutet guidelines for handling of personal data, confidentially, and IPR.

How is correct data handling according to ethical aspects safeguarded?

Patient samples are decoded by the caring doctors according to the GDPR rules such that the persons in the Lisa Westerberg lab working with the samples can't identify the patient(s). All patient samples are collected by caring doctors upon acquiring informed consent and under their respective ethical permits. Participation in the research study is voluntary and patients can withdraw from the study at any time. Participation in the research study has no impact on the patient's medical treatment. IPR will be handled according to Karolinska Institutet's handling of IPR data. All animal experiments are covered by ethical permits by PI: Lisa Westerberg.

Accessibility and long-term storage

How, when and where will research data or information about data (metadata) be made accessible? Are there any

conditions, embargoes and limitations on the access to and reuse of data to be considered?

The experimental data will be collected throughout the project using state of the art requirements for the type of data analysed. All raw/unprocessed data is stored and accessible for at least 10 years upon collection according to the requirements for academia based research and following Karolinska Institutet guidelines. Data will be created, used, and reused throughout the project. Upon publication of papers, data will be shared with the community based on databases (EGA) and by applying to standard requirements for flow cytometry and imaging data as required by the journals.

In what way is long-term storage safeguarded, and by whom? How will the selection of data for long-term storage be made?

Long-term storage is handled by the Karolinska Institutet IT department and followed by the Lisa Westerberg lab. Saved data will be stored for at least 10 years.

Will specific systems, software, source code or other types of services be necessary in order to understand, partake of or use/analyse data in the long term?

We follow current standard for data storage and current data format.

How will the use of unique and persistent identifiers, such as a Digital Object Identifier (DOI), be safeguarded?

All data is stored based on date of collection and with an experimental name. Data files are combined with written notes of experimental plan using the same date and experimental name. A DOI will be provided to datasets uploaded to depositories (EGA).

Responsibility and resources

Who is responsible for data management and (possibly) supports the work with this while the research project is in progress? Who is responsible for data management, ongoing management and long-term storage after the research project has ended?

The PI is responsible for the experimental data quality assessment, storage, and availibility according to the guidelines from the IT department at Karolinska Institutet.

What resources (costs, labour input or other) will be required for data management (including storage, back-up, provision of access and processing for long-term storage)? What resources will be needed to ensure that data fulfil the FAIR principles?

Data management will be collected, processed, stored, and shared according to the FAIR principles.