Leukocyte trafficking in the resolution of inflammation

A Data Management Plan created using DMPonline.be

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Project abstract:

Resolution of inflammation is an understudied process, with incomplete resolution causing pathological complications. It encompasses the final stages of inflammation and includes inactivation and scavenging of inflammatory mediators and cells, the removal of cellular debris and tissue repair. Regulation of leukocyte trafficking is well established in the fight against infections and as a critical component of inflammatory damage, but its beneficial or detrimental roles and its regulation during resolution are poorly understood. Our project aims at the best mechanistic understanding of leukocyte trafficking during the different phases of resolution at the molecular and cellular levels. We will study chemokine network regulation, investigate resolution mechanisms in mouse models and assess pro-resolving mechanisms in patients. Thereby, it will create new opportunities for translational interventions to improve disease resolution in a variety of inflammatory diseases.

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Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
		*Indicate: **N**(ew data) or **E**(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
signaling assays	results from signaling assays such as detection of intracellular Ca2+ concentrations, phosphorylation of second messengers, assays to quantify leukocyte migration	N	D	T,N	.xls; .docx; .rtf; .pptx; .pdf	<1TB	
proteins	recombinant and synthetic proteins and peptides	N	P	Tubes with proteins or peptides stored at -80 °C	NA		<100 tubes of 1.5 mL
proteoform quantification	detection and quantification of chemokine proteoforms by mass spectrometry	N	D	N	.d	<5TB	
murine models of inflammation	results from murine models of inflammation and resolution of inflammation including detection of multiple parameters to characterize the inflammatory response and the resolution	N	D	N	.pdf; .docx; .rtf; .xls; .pptx; .fcs; .emf; .pzfx	<1TB	
intravital microscopy	results from intravital microscopy experiments including evaluation of tissue sections	N	D,P	A, I and tissue sections	.tiff; .pgn; .mov; .mpeg	<5TB	<250 slides
patient samples	collected plasma and synovial fluid samples	N	P	Tubes with patient samples stored at -80 °C	NA		<250 samples
scRNA seq	results from single cell RNA sequencing	N	D	Sequencing data	data in R	<5 TB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

NA

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- Yes, human subject data (Provide SMEC or EC approval number below)
- Yes, animal data (Provide ECD reference number below)

ethics related to human samples S58418, S65508
ethics related to use of experimental animals: P104/2021, P128/2021, P127/2023, P058/2023, P155/2022

additional ethics approval needs to be applied for during the project prior to the use of the specific animal models
Human: ethical application for malaria clinical samples is ongoing, both at the EC UZ/KU Leuven and in Cameroon

Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).

- Yes (Provide PRET G-number or EC S-number below)

S65508 personal data will be pseudonymised by the treating physician and only the treating physician can link the data to the individual patients

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- Yes

Proteoform quantification: methods for proteoform quantification and potential use of these methods for diagnostics may be IP that could be useful for commercial valorization.

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or Data transfer agreements, Research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- Yes

Clinical malaria samples from Cameroon are subject to a standard MTA with the Centre Pasteur du Cameroon

Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, codebook.tsv etc. where this information is recorded).

1. Synthetic peptides and biological samples will be stored at -80 and the location of tubes (exact freezer and position in the freezer) will be stored in the FreezerPro database of the laboratories of Molecular Immunology, Immunobiology and Immunoparasitology.
2. Results related to signaling assays will be registered in lab books and electronically as excel or word (.xls or .docx) documents which automatically imprint the metadata (user, date, time, equipment, parameters) from the experiments. Information on quantification and experimentation parameters will be embedded by the users on the document folders and in the lab books in order to improve reproducibility and maintenance of data.
3. Microscopy images: Imaging data are created by default with metadata imprinted by the image acquisition software automatically. These include information on user, date and time, duration of experiments, equipment parameters and imaging configurations. The metadata are saved (also in OME format) and transferred with the original imaging file. The created data files will be organized in folders named by the day of the experiment (YYYYMMDD) followed by the researcher who performed it and the title of the experiment. In addition, the methodology and protocol of each experiment will be described in detail in a lab book.
4. Flow cytometry data: flow cytometry templates are saved which automatically stores the parameters (voltages, comensation,....) that are used during the acquisition of the data.
5. Mass spectrometry data are stored in folders which include the name of the specific chemokine. The folders contain all the instrument

parameters that are used during the data collection and detailed profile spectra ensuring no loss of information. Files are readable in Bruker data analysis software (current and future updated versions).
6. Mouse experiments: all necessary metadata will be included for each experiment according to laboratory templates in e.g. excel.

Will a metadata standard be used to make it easier to find and reuse the data?
If so, please specify which metadata standard will be used.

If not, please specify which metadata will be created to make the data easier to find and reuse.

- Yes

Microscopy derived data in OPE format

Data Storage & Back-up during the Research Project

Where will the data be stored?

- Shared network drive (J-drive)
- OneDrive (KU Leuven)
- Large Volume Storage
- Other (specify below)

The data will be stored in several locations, including on internal computer disks, at the shared local virtual drive (Rega drive), in One Drive, in redundant NAS (network adapted storage)-devices, and on the KU Leuven central storage servers. The KU Leuven datacenters provide storage on two locations and promise high availability and disaster recovery to preserve data for a long period. Hard copy notebooks with raw data will be stored physically in our laboratory. The large raw data volumes from analysis equipment are stored redundant on hard disks in or connected to the lab computers and work stations. The backups of the analysis data are stored on dedicated redundant NAS-services. Also, we will use the Lirias platform as data repository for published material.

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution
- Personal back-ups I make (specify below)

We will use the central server storage of KU Leuven (Data centre ICTS Luna storage), which provides a daily automatic backup. Moreover, the data will be backed up on the Rega Institute Virtual Drives (Rega NAS (network adapted storage)) and on external hard-drives by the investigators.

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, explain how this will be taken care of.

- Yes

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

All research data generated during this project will be secured by the need for login, registration on datacenter/luna and use of u-number and password, which are also restricted.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

Long-term data storage and costs will be managed by the principal investigator working in the project, Paul Proost and his future successors as head of the Research Group Immunity and Inflammation (from 2032 on). The costs for data storage is 520€/y/TB.

Data Preservation after the end of the Research Project

Which data will be retained for 10 years (or longer, in agreement with other retention policies that are applicable) after the end of the project?

In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

- Certain data cannot be kept for 10 years (explain below)

essentially all data will be retained with the exception of physical material (proteins, peptides, patient material) that would be used for experiments and as such is not available anymore

Where will these data be archived (stored and curated for the long-term)?

- Large Volume Storage (longterm for large volumes)
- KU Leuven RDR
- Other (specify below)
- Shared network drive (J-drive)

The data will be stored redundantly during and after the research in our PCs, in external hard-drives, and in the KU Leuven data centers (ICTS Luna storage and Rega NAS).

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

Long-term data storage and costs will be managed by the principal investigator working in the project, Paul Proost (or his successor after 2032). The expected cost for data storage is 520€/Y/TB.

Data Sharing and Reuse

Will the data (or part of the data) be made available for reuse after/during the project?
Please explain per dataset or data type which data will be made available.

- Yes, as restricted data (upon approval, or institutional access only)

All the data that would not potentially create IP or is protected by GDPR.
scRNA-Seq data will be deposited in freely available databases such as NCBI's Gene Expression Omnibus (GEO) database, simultaneously with publication of the results in a peer-reviewed paper

If access is restricted, please specify who will be able to access the data and under what conditions.

Access to external users will be evaluated by Paul Proost (upon consultation of the other project supervisors). Access to patient data needs to be requested from the treating physicians and after approval by the ethics committee.

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal

restrictions)?

Please explain per dataset or data type where appropriate.

- Yes, intellectual property rights
- Yes, ethical aspects

MTA with Univ. of Copenhagen on use of cell lines and with Centre Pasteur du Cameroon on clinical samples.
In addition, IP will first be protected for data that may lead to potential commercial valorization.

Where will the data be made available?

If already known, please provide a repository per dataset or data type.

- KU Leuven RDR (Research Data Repository)

When will the data be made available?

- Upon publication of research results
- Other (specify below)

Data will be made available immediately after publication and clearance by Intellectual Property officers of KU Leuven. Data related to MTA's with external partners can only be made available upon agreement of the external partner (e.g. Univ. of Copenhagen and Centre Pasteur du Cameroon)

Which data usage licenses are you going to provide?

If none, please explain why.

- Data Transfer Agreement (restricted data)
- CC-BY 4.0 (data)

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- No

What are the expected costs for data sharing? How will these costs be covered?

Local costs are minimal. Data transfer (e.g. of frozen material) to external partners will be at the partners cost.

Responsibilities

Who will manage data documentation and metadata during the research project?

The principle investigator Paul Proost and research expert Mieke Gouwy will be responsible for this.

Who will manage data storage and backup during the research project?

The principle investigator Paul Proost and research expert Mieke Gouwy will be responsible for this.

Who will manage data preservation and sharing?

The principle investigator Paul Proost and research expert Mieke Gouwy will be responsible for this.

Who will update and implement this DMP?

The principle investigator Paul Proost and research expert Mieke Gouwy will be responsible for this.