GPMU/22/006 Using evasins as tools to regulate the activation and recruitment of leukocytes to injury sites (3M220286)

A Data Management Plan created using DMPonline.be

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Template: KU Leuven BOF-IOF

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Project abstract:

Uncontrolled inflammation is a major public health issue. It is difficult to treat clinically and is not restricted to the devastating pneumonia resulting from covid-19 infections. Thus, there is an urgent need for anti-inflammatory therapies that apply to covid-19 but also to the many inflammatory disorders affecting humans. During evolution, ticks had to circumvent an attack by the immune system of their mammalian host. As such, ticks developed mechanisms that reduce inflammation while they feed on their host. One family of proteins that belongs to this anti-inflammatory system are the evasins. Evasins bind to chemokines, proteins that are crucial to attract leukocytes to the site of inflammation. There is, however, limited knowledge on the mechanisms evasins use to reduce the effects of chemokines in vivo. Do they only block interactions of chemokines with their G protein-coupled receptors? Do they affect chemokine presentation on glycosaminoglycans? Do they also influence the activity of chemokines by interfering with chemokine processing? A joint doctoral student between the universities of Leuven and Maastricht will use the complementary expertise of both groups and produce evasins and chemokines by chemical peptide synthesis. The potential interference of the evasins with the inflammatory activity of chemokines and its influence on the regulation of posttranslational chemokine processing will be investigated. Site-specific fluorescent labelling of evasins and chemokines in Maastricht will allow to investigate mechanisms of action in acute injury models in Leuven by intravital microscopy. Moreover, the therapeutic potential of evasins to treat acute liver injury will be evaluated.

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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
Microscopy images and movies	Intravital microscopy of APAP and control mice. Live-cell imaging of leukocyte phagocytosis of necrotic debris. In vitro debris model. Immunostainings of cryosections of injured and control livers.	N	D	A	.tiff or .png .mov or .mpeg	<5TB	
Live cell Incucyte images	Cell function using the Incucyte platform	N	D	A	tiff or .png	<1TB	
Observational and numeric data	ELISA, ALT, MPO, creatinine, elastase, LDH and other spectrophotometric assays. Flow cytometry analysis of neutrophil receptors involved in debris phagocytosis.	N	D	N	.xls .wsp or .fcs .csv	<100GB	
Protein sequences	Protein sequences obtained from the protein sequencer in the laboratory	N	D	N	.txt	<1GB	

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:

Not applicable

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

The Ethical Committee for Animal Experimentation at KU Leuven approved the use of mice during this project (P125/2019 and P128/2021). The Ethics committee for Medical Research UZ/KU Leuven approved the use of healthy donors to isolate human leukocytes (S58418). The ethical dossier for this project was updated to be compliant with the GDPR and biobank laws.

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).

- No

No, we do not collect or use human/patient information in this project

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

All research data generated during this project has the potential 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.

- No

We are not reusing data not using data from 3rd parties.

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. Microscopy images: Imaging data is created by default with metadata imprinted by the image acquisition software's automatically. That includes information on user, date and time, duration

of experiments, equipment parameters and imaging configurations. The metadata is saved (also in OME format) and transferred with the original imaging file. The created data files will be organized in folders named by the date of the experiment (YYYYMMDD) followed by the researcher who performed it and the title of the experiment. The methodology and protocol of each experiment will be described in detail in a lab book.
2. Flow cytometry data: Flow cytometry templates are saved which automatically stores the parameters (voltages, compensation...) that are used during the acquisition of the data.
3. The numerical data obtained in quantifications and spectrophotometric analyses will be saved in excel and word formats (.xlsx and .doc), which also imprint automatically the metadata (user, date, time, equipment parameters) from those experiments. Moreover, information on quantification and experimentation parameters will be embedded by the users on the document folders in order to improve data reproducibility and maintenance. The methodology and protocol of each experiment will be described in detail in a lab book.
4. The protein sequence files contain metadata that informs the day, user and procedure of sequencing.

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

OME 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 the workstations. The backups of the analysis data are stored on dedicated redundant NAS-devices. 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 back up. Moreover, the data will be backed up on the Rega Institute Virtual Drives (Rega NAS (network adapted storage)) and on external hard-drives kept 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

The local personal- and shared drives on the computers offer enough storage. Additionally, KU Leuven offers storage on Microsoft OneDrive.

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. In case of potential IP establishment for one or more molecules developed in the project, the restriction will consist of omission of the molecule sequence and codenaming.

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, Pedro Marques. The cost for data storage is 520 Euro/terabyte/year, thus, the accumulated cost for 4 years is approximately 5200 euro. The costs will be covered by previous and current funding obtained by the host lab.

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...).

- All data will be preserved for 10 years according to KU Leuven RDM policy

All data, raw or processed, will be stored for a minimum of 10 years, according to KU Leuven policy.

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

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

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 (network adapted storage).

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, Pedro Marques. The expected cost for data storage is 520 euro/terabyte/year.

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 are not under IP protection.

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 and authorized by Pedro Marques. After clearance by IP officers and embargoes, the data will be deposited in the Zenodo repository.

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

Any datasets that are connected to IP.

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)
- Other data repository (specify below)

- In an Open Access repository
- In a restricted access repository
- Upon request by mail

All Data types will be available by access to our virtual and local data storage facilities as outlined above. Access to external users will be evaluated and authorized by Pedro Marques. After clearance by IP officers and embargoes, the data will be deposited in Lirias and Zenodo repositories.

When will the data be made available?

- Upon publication of research results
- Specific date (specify below)

- After the embargo period
- Upon publication of the research results

Data will be made available immediately after publication and clearance by Intellectual Property officers at KU Leuven.

Which data usage licenses are you going to provide?

If none, please explain why.

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

- Yes, a PID will be added upon deposit in a data repository

The data files will be identified with DOI numbers.

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

Local costs are minimal. Data transfer to external partners will be at the partners cost.

Responsibilities

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

The principal investigator Pedro Marques and the researcher Emilia Bialek will be responsible for this.

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

The principal investigator Pedro Marques and the researcher Emilia Bialek will be responsible for this.

Who will manage data preservation and sharing?

The principal investigator Pedro Marques and the researcher Emilia Bialek will be responsible for this.

Who will update and implement this DMP?

The principal investigator (Pedro Marques) and the researcher (Emilia Bialek) will be responsible for implementing the DMP. They will update the DMP anytime conditions change. A mid-term review will be accompanied by a detailed DMP and a final reviewed DMP will be sent along with the final report.