SENIOR POSTDOC FELLOWSHIP (FWO DMP)

DMP TITLE

ADMIN DETAILS

Project Name: Senior postdoc fellowship (FWO DMP) - DMP title
Project Identifier: 12V7522N
Grant Title: 12V7522N
Principal Investigator / Researcher: Jérôme Wahis
Project Data Contact: jerome.wahis@kuleuven.be
Description: The prevalence of seizures in Alzheimer's disease (AD) is high relative to age-matched controls. It is known that the amyloid beta (A?) peptide, central to AD pathology, is capable of inducing neuronal depolarization but is also released from neurons in an activitydependent fashion. This indicates a potential positive feedback loop, accelerating disease progression. Noradrenergic signaling, which is known to be anti-epileptic, is impaired early in AD. Interestingly, seizure-suppressing effects of noradrenaline (NA) have been correlated to increased GABA concentration. Astrocytes regulate extracellular levels of (neuro)transmitters, such as GABA, which controls excitability, and are key, if not primary, targets of NA signaling. I will then use the APP/PS1 mouse line to explore a possible link between NA signaling, astrocytes and seizure suppression in AD. I will first manipulate NA signaling in astrocytes and use electrophysiological and biochemical methods to measure seizure activity, (neuro)transmitter and A? levels ex vivo. I will then exploit the newly obtained knowledge to try and slow, or stop, the progression of A? buildup in vivo. The associated effects on cognitive function in APP/PS1 mice will be assayed using a battery of behavioral tests.
Establishing a central role for NA-triggered astrocyte activity in seizure suppression and A? accumulation would represent a paradigm shift, opening up new avenues for targeted therapeutics in AD.
Institution: KU Leuven

1. GENERAL INFORMATION

Name applicant
Jérôme Wahis

FWO Project Number & Title

FWO project number: **12V7522N**

Title: **Elucidating the role of astrocytes in noradrenaline-mediated seizure suppression and its possible therapeutic relevance for Alzheimer's disease.**

Affiliation

- KU Leuven
- Vrije Universiteit Brussel

Main promotor Dr. Matthew Holt belongs to the KU Leuven; main part of the work will be conducted in the KU Leuven.

Co-promotor Dr. Ils Smolders belongs to VUB; minor part of the work will be conducted in VUB.

2. DATA DESCRIPTION

Will you generate/collect new data and/or make use of existing data?

- Generate new data

Describe in detail the origin, type and format of the data (per dataset) and its (estimated) volume. This may be easiest in a table (see example) or as a data flow and per WP or objective of the project.

If you reuse existing data, specify the source of these data.

Distinguish data types (the kind of content) from data formats (the technical format).

Work package #	Data format	Volume	How created
1a)	.msrd; .abf; .txt; .xlsx; .mat	300 GB	Recordings on multi-electrode array or patch-clamp setup ; Various analysis software
1b)	.cdf, .txt; .xlsx; .mat	50 GB	HPLC measures ; Various analysis software
1c)	.xlsx; .mat	10GB	ELISA measures ; Various analysis software
2.1a)	.msrd; .abf; .txt; .xlsx; .mat	300 GB	Recordings on multi-electrode array or patch-clamp setup ; Various analysis software
2.1b)	.msrd; .abf; .txt; .xlsx; .mat	300 GB	Recordings on multi-electrode array or patch-clamp setup ; Various analysis software

2.1c)	.tif; .txt; .xlsx; .mat	10GB	Western blot data
2.1d)	.cdf, .txt; .xlsx; .mat	50 GB	HPLC measures ; Various analysis software
2.1e)	.xlsx; .mat	10GB	ELISA measures ; Various analysis software
2.2c)	.msrd; .abf; .txt; .xlsx; .mat	300 GB	Recordings on multi-electrode array or patch-clamp setup ; Various analysis software
2.2d)	.cdf, .txt; .xlsx; .mat	50 GB	HPLC measures ; Various analysis software
2.2e)	.xlsx; .mat	10GB	ELISA measures ; Various analysis software
3b)	.mov ; .mp4; .xlsx; .mat	300 GB	Behavioral studies movies and tracking data files
3c)	.tif	50 GB	Microscopy image for histological analysis

3. LEGAL AND ETHICAL ISSUES

Will you use personal data?

If so, shortly describe the kind of personal data you will use. Add the reference to your file in KU Leuven's Register of Data Processing for Research and Public Service Purposes (PRET application).

Be aware that registering the fact that you process personal data is a legal obligation.

- No

Privacy Registry Reference:
Short description of the kind of personal data that will be used:

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, add the reference to the formal approval by the relevant ethical review committee(s)

- Yes

I will use two different ethical approval, with one already delivered:
1) KU Leuven ethical comittee approval P226/2018
2) The other one is still pending.

Does your work possibly result in research data with potential for tech transfer and valorisation? Will IP restrictions be claimed for the data you created? If so, for what data and which restrictions will be asserted?

- No

Do existing 3rd party agreements restrict dissemination or exploitation of the data you (re)use? If so, to what data do they relate and what restrictions are in place?

- No

4. DOCUMENTATION AND METADATA

What documentation will be provided to enable reuse of the data collected/generated in this project?

GENERAL CONSIDERATIONS:

All final protocols used to generate data in this study will be saved in electronic versions on both a portable hard drive and on a dedicated server (KU Leuven L-drive). Each experiments conducted will be logged in an electronic lab book, and the protocols used to generate experimental data will be explicitely reffered to in each lab book entry. Any deviation from the written protocol will be carefully indicated in the lab book entry. Whenever applicable, we will record the metadata in the files themselves. As a standard rule, the raw data and corresponding analysis file names will always be saved in a folder named explicitely for the type of experimental data it contains (e.g. HPLC), then in a subfolder with the date at which data were generated as name (in *yymmdd* format, as recomended by the International Organization for Standardization, ISO 8601). The filenames of the data files will contain the date, also in *yymmdd* format, as well as the ID of the individual animal(s) used for experiments, the replication unit(s) and treatment(s). An example of this would be 220531_Animal2_slice1_treatment1. This file naming system will allow to trace back to which exact (part of an) experiment the raw data or analysis file refer to, using the labbook to crossreference it to the protocols used to generate the data, but also specific observations. All analysis protocols will be written up following the same standards as for experimental protocols, and new files generated during analysis saved following the same rules as for raw data.

SPECIFIC CONSIDERATIONS:

Electrophysiological data (Multi-electrode array recordings): The protocol files which defines which stimulation paradigm(s) (if any) were used will be archived in specific folders, and lab book entry for each recording will specify which exact stimulation paradigm(s) were used. The specific information on the recording files (e.g. sampling rate, filters applied...) will be automatically recorded as metadata in the file, but also taken as notes in the lab book entry by the experimenter.

Microscopy images: dimensions, image type, bit-depth, pixel sizes and microscope settings will be recorded in the meta data in the file, as well as written in the lab book entry for each images dataset.

Biochemical assays (HPLC, ELISA): the parameters of the apparatus used to obtain these measurments will be carefully noted down in lab book entries, as metadata integration in the files is not always readily available for these type of recordings.

Will a metadata standard be used? If so, describe in detail which standard will be used. If no, state in detail which metadata will be created to make the data easy/easier to find and reuse.

- No

Electrophysiological data (Multi-electrode array recordings): the metadata will be recorded within the raw data files, using specific format depending on which software will be used, but in any case, the most widely use data formats will be chosen when multiple possibilities exist. Indeed, proprietary software of electrophysiological instruments usually can be exported in a variety of format such as HDF5, which include metadata recording in the file.
Microscopy images: the type of metadata standard will depend on the final type (brand) of microscope and its proprietary software used.
As a general rule, If no automatic metadata system is available or if the metadata is deemed incomplete, the metadata will be manually recorded in the lab book entry.

5. DATA STORAGE AND BACKUP DURING THE FWO PROJECT

Where will the data be stored?

How is backup of the data provided?

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely. If no or insufficient storage or backup capacities are available then explain how this will be taken care of.

- Yes

I foresee that the total capacity needed for this project will be around 1740 GB. The KU Leuven L-drive has an unlimited capacity and will be paid for by my host lab. For more information on the L-Drive, please refer to https://gbiomed.kuleuven.be/english/IT/our-services/data-storage/data-storage.
The portable hard drive I currently use has a total capacity of 2048 GB, which is sufficient to hold the entire project data. If needed, such hard drive can be bought for a €100 in 2022, which will be paid by my host lab if needed.

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

The cost of the L-drive rental for a year is €569,2 as of May 31st, 2022. This cost is for 5 TB of storage, which is more than 2 times my needs. My host lab pays this for the entirety of the lab.
Additional space can be readily required, and paid for at a price of €99,5 per year per TB. My host lab will cover this cost using other fund sources.

Data security: how will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

- The KU LEuven L-drive system is protected by the KU Leuven ICTS security, and require a specific demand to authorized HR personel with the head of the lab approval before access can be granted using KU Leuven credential. Therefore, only me or direct project collaborators from KU Leuven will be granted access to the L-Drive, only if absolutely required.
- The portable hard drive is stored in a key locked shelf when not in use. Similarly, the hard drive will be given only to trustworthy collaborators and only if absolutely needed.

6. DATA PRESERVATION AFTER THE FWO PROJECT

Which data will be retained for the expected 5 year period after the end of the project? In case only a selection of the data can/will be preserved, clearly state the reasons for this (legal or contractual restrictions, physical preservation issues, ...).
All data, meaning raw data and their analysis, will be preserved as indicated above for the required five years and more. Upon publication, raw data published will be further saved on the KU Leuven K-Drive, which only allow data to be written once on it (read-only feature), without further modification possible, ensuring no data tempering will occur.

Where will the data be archived (= stored for the longer term)?
For the longer term, raw data and their analysis will be saved on the KU Leuven K-Drive, which only allow data to be written once on it (read-only feature), without further modification possible, ensuring no data tempering will occur. As explained above, a mirrored copy of these data will also be saved on a portable hard drive, stored in a locked shelf, for which the head of the lab will keep the keys.

What are the expected costs for data preservation during the retention period of 5 years? How will the costs be covered?
The total cost of storage for five years in the KU Leuven L-Drive is about €1000 (2 TB at €199 per year, paid for by my host lab funds). The portable hard drive is already available and paid for.

7. DATA SHARING AND REUSE

Are there any factors restricting or preventing the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?

- No

Which data will be made available after the end of the project?

Where/how will the data be made available for reuse?

- Upon request by mail

When will the data be made available?

- Upon publication of the research results

Who will be able to access the data and under what conditions?

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

The expected costs are minimal, with transfer of data through digital network means. In case unexpected costs appear, we would expect the recipient of our data to pay the fees.

8. RESPONSIBILITIES

Who will be responsible for data documentation & metadata?

- The primary responsible person for data documentation & metadata is Dr. Jérôme Wahis.
- In their supervising roles, Dr. Matthew Holt and Dr. Ilse Smolders will also be responsible to control for correct data documentation & metadata.

Who will be responsible for data storage & back up during the project?

- The primary responsible person for data storage and back up during the project is Dr. Jérôme Wahis.
- In their supervising roles, Dr. Matthew Holt and Dr. Ilse Smolders will also be responsible to control and help Dr. Jérôme Wahis in this task.

Who will be responsible for ensuring data preservation and reuse ?

In their promotor roles, both Dr. Matthew Holt and Dr. Ilse Smolders will be ensuring data preservation and reuse.

Who bears the end responsibility for updating & implementing this DMP?

In their promotor roles, both Dr. Matthew Holt and Dr. Ilse Smolders will bear the end responsibility of updating & implementing this DMP.