PROJECT G0A5422N – CONTRIBUTIONS OF HIPPOCAMPAL-PREFRONTAL NETWORKS TO MEMORY

A Data Management Plan created using DMPonline.be

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Funder: FWO

Template: Senior Project

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Grant number / URL: G0A5422N

ID: n.

Start date: 1 Jan 2022

End date: 31 Dec 2025

Project abstract:
Memories of past experiences influence how we view the present and how we make predictions about the future. The brain is welltuned to capture and translate precise information about experiences into a set of memory traces arranged in a network of distributed connections. During periods of immobility and sleep, the brain is actively reactivating previously stored memories as evidenced by internally-generated patterns of neuronal activity that reflect recent experiences. These "replay" events are believed to strengthen the integration of new knowledge into the brain's memory store and support simulation of possible future actions. We aim to elucidate how the expression of internally generated hippocampal replay events, embedded in hippocampal ripples, contribute to neocortical replay, and eventually to the consolidation of memory in the neocortex. For this, we will first detect hippocampal ripples and then immediately perturb prefrontal replay events selectively as a way to probe their specific role in learning. We will further study, through optogenetic silencing, whether and how the hippocampal replay is transferred and integrated to neocortical replay, and eventually consolidated into the neocortex.

Last modified: 27 Oct 2022

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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.

Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
We will generate digital records of brain activity in rodents and video tracking records of their behavior. The	*Indicate:* ***N****(ew data) or* ***E****(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual		Indicate: <1GB	

data is stored in standard file formats that can be read in common analysis environments (e.g. matlab, Python, etc.). Metadata that is not already part of the raw data will be stored in text files (YAML format) or custom database and saved alongside the raw data and experimental logs. Software for data analysis written in Python or C++ languages will be saved in text files together with documentation of their use.	N		**I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		<100GB <1TB <5TB >5TB NA	
Analysis scripts and codes, and statistical analysis	N	D	SO	.m(at), .py(w), .r, .dll	<10GB	Project folder on L drive
Processed data	N	D	I, N, T	.xlsx, .txt,.m at,	<100GB	Project folder on L-drive
Presentations, Protocols, reports	N	D	T	.ppt, .docx, . pdf	<100GB	Project folder on L-drive
Metadata	N	D	T	.txt/.docx	<1GB	Project folder on L drive
Electrophysiology data	N	D	N	.dat, .mat	<1TB	Project folder on L-drive
Behavioral data	N	D	N,T	.docx, .xlsx,	<1GB	Project folder on L-drive

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)

For the rodent studies (WP2-3), ethical approval is requested from the KU Leuven Ethical Committee Animal Experimentation (ECD) before the start of the experiments.

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

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.

- No

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

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).

Data will be kept on a shared secured network drive of the lab and will be uploaded and updated by a member of the research team every time a new experiment takes place or data is being generated. The names of the files will be structured in a comprehensible way: Experiment type/date/main parameters used. In addition, data will be stored in a folder per experimental setup, the type of investigated sample and the acquision/generation date. The analysis files will contain notes describing the analysis procedure and mention which original data files are included. A readme file describing the goal of the experiment and the analysis procedure will be stored in the folder where the data is saved.

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.

- No

For data in all WPs: Metadata will be manually added in the experiment folders and files to label the experimental data, acquisition protocol and context within the project.

DATA STORAGE & BACK-UP DURING THE RESEARCH PROJECT

Where will the data be stored?

- OneDrive (KU Leuven)
- Large Volume Storage

- Sharepoint online
- Shared network drive (J-drive)

Time-stamped copies of the data will be kept on personal secured KU Leuven onedrive by individual users collecting the data and on shared large volume storage network drive at PPW Faculty.

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS

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?

The KU Leuven shared network drives on which the data are stored have restricted access which will only be granted to lab members working on the project. For these lab member access is password protected.

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

Based on KU Leuven data storage costs the price is estimated to remain below 500 euros for the project duration. This is covered by the project budget.

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

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

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

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

Data preservation for 10 years after the project ends will be covered by the general consumable funds provided by faculty PPW, KU Leuven, to the Research Unit. These funds amount to a couple of 1000 euros per year and are thus sufficient to support this storage.

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 open data

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

N/A

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.

- No

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

Which data usage licenses are you going to provide?

If none, please explain why.

- 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.

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

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

The costs of data sharing are estimated to remain below 200 euros. These will be covered by the project budget.

RESPONSIBILITIES

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

data/metadata documentation will be managed by Prof Rudi D'Hooge. Researchers and Postdocs in the research team generating the data are responsible for the appropriate collection, treatment and storage. They ensure that appropriate metadata is included.

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

data storage and back-up will be managed by Prof D'Hooge with the support of the ICT team of the PPW Faculty.

Who will manage data preservation and sharing?

Prof. Rudi D'Hooge will manage data preservation and sharing

Who will update and implement this DMP?

Prof. Rudi D'Hooge will update and implement the DMP