FWO DMP Template - Flemish Standard Data Management Plan

Version KU Leuven

Project supervisors (from application round 2018 onwards) and fellows (from application round 2020 onwards) will, upon being awarded their project or fellowship, be invited to develop their answers to the data management related questions into a DMP. The FWO expects a **completed DMP no later than 6 months after the official start date** of the project or fellowship. The DMP should not be submitted to FWO but to the research co-ordination office of the host institute; FWO may request the DMP in a random check.

At the end of the project, the **final version of the DMP** has to be added to the final report of the project; this should be submitted to FWO by the supervisor-spokesperson through FWO's e-portal. This DMP may of course have been updated since its first version. The DMP is an element in the final evaluation of the project by the relevant expert panel. Both the DMP submitted within the first 6 months after the start date and the final DMP may use this template.

The DMP template used by the Research Foundation Flanders (FWO) corresponds with the Flemish Standard Data Management Plan. This Flemish Standard DMP was developed by the Flemish Research Data Network (FRDN) Task Force DMP which comprises representatives of all Flemish funders and research institutions. This is a standardized DMP template based on the previous FWO template that contains the core requirements for data management planning. To increase understanding and facilitate completion of the DMP, a standardized **glossary** of definitions and abbreviations is available via the following link.

1. General Project Information	
Name Grant Holder & ORCID	**GIOIA DE FRANCESCHI; https://orcid.org/0000-0001-6429-3402**
Contributor name(s) (+ ORCID) & roles	**KARL FARROW, promotor; https://orcid.org/0000-0003-1409-096X** **SANTIAGO ROMPANI, co-promotor; https://orcid.org/0000-0002-3994-3052**
Project number [1] & title	Parallel processing of multisensory information in conscious and unconscious visual pathways.
Funder(s) GrantID [2]	1298724N
Affiliation(s)	X KU Leuven ☐ Universiteit Antwerpen ☐ Universiteit Gent ☐ Universiteit Hasselt ☐ Vrije Universiteit Brussel X Other: Neuroelectronics research flanders; European Molecular Biology Laboratory ROR identifier KU Leuven: 05f950310
Please provide a short project description	We perceive the world through multiple senses that need to be integrated by the brain to produce appropriate behavior. This multisensory integration is usually ascribed to very integrative cortical areas, but recent studies suggest this could happen earlier in sensory circuits. My project aims at exploring multisensory integration at very early stages of two parallel visual pathways: the unconscious pathway, through the superior colliculus, and the conscious visual pathway, through the visual thalamus. First, we will use extracellular electrophysiology to assess how auditory stimuli modulate the visual responses of neurons in the superior colliculus and the visual thalamus. Then, we will use two-photon axonal calcium imaging to assess audio-visual modulation in the retinal output to these two areas. Preliminary studies identified that an auditory nucleus involved in the acoustic startle reflex projects to the superior colliculus and the visual thalamus, suggesting a putative circuit underpinning audio-visual modulations in these parallel subcortical visual nuclei. Therefore, we will finally use two-photon axonal calcium imaging and opto/chemogenetic perturbations to determine if this projection underpins the observed multisensory integration. Comparing multisensory processing in the conscious and unconscious visual pathways will shed light on how cross-sensory integration is differentially implemented, greatly improving our understanding of how sensory perception works.

[1] "Project number" refers to the institutional project number. This question is optional. Applicants can only provide one project number.

[2] Funder(s) GrantID refers to the number of the DMP at the funder(s), here one can specify multiple GrantIDs if multiple funding sources were used.

2. 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 [3].

				ONLY FOR DIGITAL DATA	*ONLY FOR DIGITAL DATA*	*ONLY FOR DIGITAL DATA*	*ONLY FOR PHYSICAL DATA*
Dataset Name	Description	New or Reused	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)	Physical Volume
Ephys	Extracellular electrophysiological recordings in multiple brain areas (SC, LGN)	☒ Generate new data	☒ Digital ☐ Physical	☒ Experimental	.bin .meta	< 25 TB	
2p	Two-photon calcium imaging of retinal ganglion cell boutons	☒ Generate new data	☒ Digital ☐ Physical	☒ Images ☒ Numerical ☒ Experimental	.tiff	<10 TB	
Body tracking	Tracking of animal's eye, face and body	☒ Generate new data	☒ Digital ☐ Physical	☒ Images ☒ Experimental ☒ Observational	.avi .tiff	<5 TB	
Movement tracking	Tracking of motion of the animal on the treadmill	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Experimental ☒ Observational	.csv	< 1 GB	
Lick sensor	Tracking of the task-related	☐ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Experimental	.csv	< 1 GB	

[3] Add rows for each dataset you want to describe.

	responses of the mice	☐ Reuse existing data		☒ Observational			
Stimuli tracking	Tracking of the stimuli being presented	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Experimental	.csv .prefs .prot .stimlog .mat	< 1 GB	
Histology	Histology of ephys and 2p experiments	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Images ☒ Experimental	.tiff .meta	< 100 GB	
Presentations	Posters and presentations delivered at meetings / conferences	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Images ☒ Experimental	.pptx .pdf .svg	< 100GB	
Analysis code	Analysis script and code necessary to analyse raw data	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Software	.m	< 1GB	
Analysed data	Analysed and compressed data	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Compiled / aggregated data	.mat .csv	<1TB	
Manuscripts	Manuscripts resulting from the project	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☒ Images ☒ Compiled / aggregated data ☒ Textual ☒ Other	.docx .pdf .jpeg	< 1 GB	

GUIDANCE: *The data description forms the basis of your entire DMP, so make sure it is detailed and complete. It includes digital and physical data and encompasses the whole spectrum ranging from raw data to processed and analysed data including analysis scripts and code. Physical data are all materials that need proper management because they are valuable, difficult to replace and/or ethical issues are associated. Materials that are not considered data in an RDM context include your own manuscripts, theses and presentations; documentation is an integral part of your datasets and should described under documentation/metadata.* *RDM Guidance on data*	
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.	
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: ☒ Yes, animal data; provide ECD reference number: ☐ Yes, dual use; provide approval number: ☐ No Additional information:
Will you process personal data[4]? 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) ☒ No Additional information:
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 ☒ No If yes, please comment:

[4] See Glossary Flemish Standard Data Management Plan

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements, research collaboration agreements)? If so, please explain to what data they relate and what restrictions are in place.	☐ Yes ☒ No If yes, please explain:
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 to what data they relate and which restrictions will be asserted.	☐ Yes ☒ No If yes, please explain:

3. 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). *RDM guidance on documentation and metadata*.	During the project, data will be stored on the labs file server (capacity for this project: 50 TB) for easy access of the data. Manuscripts are stored on a group-internal OneDrive that is based on the imec corporate account. After each experiment, the data is saved to the labs file server. Data can be transferred to the server in EMBL Rome, and can be analyzed either in NERF or at EMBL. After analysis, all data is stored at the institute-internal file server (capacity for this project: of 50 TB NERF, 10 TB EMBL). Each animal will be assigned an experiment number and data folder that will be duplicated into the labs servers e.g,: //NERFFS17/farrowwip (for analysis) and //NERFHF01/farrowarch (for permanent storage) at NERF or https://dma.embl.de/ (storage) and \\rompani.embl.it (analysis), at EMBL. Inside each experiment folder, a common sub folder structure will be followed, including folder with type of data (imaging, electrophysiology, histology, behaviour...)/folder named with the date when the data was generated (session folder)/folder with raw data or pre-processed or analysed data. In order to keep track and easily find the data relevant to this project, in the institutional Onedrive of the lab, in the folder specific for this project and in the project folder on the server, a metadata file (Excel) will be created stating the details of each mouse (identification number, gender, mouse line, fluorescent reporters present in the mouse brain, cage number, date of birth, ear tag), and the type of experiments performed to each mouse (behavior, electrophysiological recordings, brain imaging...) with details of each day's experiment (E.g: general quality of the experiment, relevant events particular of that experiment, paradigms performed, type of session (training/experimental session), observational comments on the state of the animal during the experiment), specific location of the data (e.g. in which partition of NERFFS server), and stage of analysis. Additionally, details about each mouse (gender, date of birth, mouse line...) and each stage of each mouse experiment (surgery, habituation session, training session, experimental session) will be logged on an outlook OneNote Labbook.

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. *REPOSITORIES COULD ASK TO DELIVER METADATA IN A CERTAIN FORMAT, WITH SPECIFIED ONTOLOGIES AND VOCABULARIES, I.E. STANDARD LISTS WITH UNIQUE IDENTIFIERS.*	☐ Yes ☒ No If yes, please specify (where appropriate per dataset or data type) which metadata standard will be used: If no, please specify (where appropriate per dataset or data type) which metadata will be created: In project folder on the server: -Metadata file will be created for the project to record: All experimental numbers/mice included in the project, details about the mice and about all procedures they are subject to, type of experiments, which subproject they belong to, task used, data types per session, mouse line, analysis stage, location of the data. In project folder on the institutional Onedrive of the lab: -Metadata file will be created for the project to record: All experimental numbers/mice included in the project, details about the mice and about all procedures they are subject to, type of experiments, which subproject they belong to, task used, data types per session, mouse line, analysis stage, location of the data. In OneNote Labbok: -Metadata file will be created for each mouse and each session to record: details about the animal and the session, general quality of the experiment, relevant events particular of that experiment, number of trials, type of session (training, experimental session), observational comments on the state of the animal during the experiment.

4. Data Storage & Back-up during the Research Project

Where will the data be stored? *Consult the interactive KU Leuven storage guide to find the most suitable storage solution for your data.*	Data will be stored in the institutional servers of NERF (IMEC) and EMBL. All data generated in the Farrow lab will be duplicated and stored in the archiving server (NERFHF01) and the working server (//NEFFS17/farrowlabwip2023/Data). All data generated at EMBL will be stored in https://dma.embl.de/ (storage) and \\rompani.embl.it (analysis).
How will the data be backed up? *WHAT STORAGE AND BACKUP PROCEDURES WILL BE IN PLACE TO PREVENT DATA LOSS?*	Data will be stored in the institutional servers of NERF (IMEC) and EMBL. All data generated in the Farrow lab will be duplicated and stored in the archiving server (NERFHF01) and the working server (//NEFFS17/farrowlabwip2023/Data). All data generated at EMBL will be stored in https://dma.embl.de/ (storage) and \\rompani.embl.it (analysis).
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 ☐ No If no, please specify:
How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons? *CLEARLY DESCRIBE THE MEASURES (IN TERMS OF PHYSICAL SECURITY, NETWORK SECURITY, AND SECURITY OF COMPUTER SYSTEMS AND FILES) THAT WILL BE TAKEN TO ENSURE THAT STORED AND TRANSFERRED DATA ARE SAFE.* *Guidance on security for research data*	All computers at the institutes are password protected. Additionally, to access the servers where the data is stored one can only do it through a password protected computer or by connecting directly to the server, which is also password protected. Only members of the lab receive access to the computers and servers of the lab.
What are the expected costs for data storage and backup during the research project? How will these costs be covered?	At NERF, the cost is 28€/TB/year for storage and back up in a second server. All costs related to the storage of data are taken care through grants and institutional funding from NERF. At EMBL, the cost is 80€/TB/year for storage and back up in a second server, and of 5€/TB/year for long term tape storage. All costs related to the storage of data are taken care through grants and institutional funding from EMBL.

5. Data Preservation after the end of the Research Project	
Which data will be retained for at least five 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...). *Guidance on data preservation*	☒ All data will be preserved for 10 years according to KU Leuven RDM policy ☐ All data will be preserved for 25 years according to CTC recommendations for clinical trials with medicinal products for human use and for clinical experiments on humans ☐ Certain data cannot be kept for 10 years (explain)
Where will these data be archived (stored and curated for the long-term)? *Dedicated data repositories are often the best place to preserve your data. Data not suitable for preservation in a repository can be stored using a KU Leuven storage solution, consult the interactive KU Leuven storage guide.*	All data generated in the Farrow lab will be duplicated and stored in the archiving server (NERFHF01) for long-term storage. All data generated in the Rompani lab will be duplicated and stored in the archiving server (https://dma.embl.de/) for long-term storage. Additionally, all data related to published results derived from this project will be stored in the KU Leuven research data repository for public access.
What are the expected costs for data preservation during the expected retention period? How will these costs be covered?	KU Leuven Research Data Repository allows free storage of up to 50GB. Since the data that will be uploaded will be pre-processed and analyzed data, we do not expect to exceed that amount. Regarding all raw data produced and stored in the Farrow lab during the project, the cost is 28€/TB/year for storage and back up in a second server. Costs are paid through grants by the lab. All costs related to the storage of raw data stored are taken care through grants and institutional funding from NERF. Regarding all raw data produced and stored in the Rompani lab during the project, the cost is 80€/TB/year for storage and back up in a second server, and of 5€/TB/year for long term tape storage. All costs related to the storage of data are taken care through grants and institutional funding from EMBL.

6. 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. *NOTE THAT 'AVAILABLE' DOES NOT NECESSARILY MEAN THAT THE DATA SET BECOMES OPENLY AVAILABLE, CONDITIONS FOR ACCESS AND USE MAY APPLY. AVAILABILITY IN THIS QUESTION THUS ENTAILS BOTH OPEN & RESTRICTED ACCESS. FOR MORE INFORMATION: HTTPS://WIKI.SURFNET.NL/DISPLAY/STANDARDS/INFO-EU-REPO/#INFOEUREPO-ACCESSRIGHTS*	☐ Yes, as open data ☐ Yes, as embargoed data (temporary restriction) ☒ Yes, as restricted data (upon approval, or institutional access only) ☐ No (closed access) ☐ Other, please specify: All the data generated in this project will be made accessible to third parties after publication of the results, through the institutional research data repository or the KU Leuven.
If access is restricted, please specify who will be able to access the data and under what conditions.	Only lab members and collaborators in this project (e.g., the Rompani Lab) will have direct access to the data generated in this project in order to help with the analysis and manuscript writing.
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, privacy aspects ☐ Yes, intellectual property rights ☐ Yes, ethical aspects ☐ Yes, aspects of dual use ☐ Yes, other ☒ No If yes, please specify:

Where will the data be made available? If already known, please provide a repository per dataset or data type.	All data generated in the Farrow lab will be duplicated and stored in the archiving server (NERFHF01) for long-term storage and will be reusable upon reasonable request. All data generated in the Rompani lab will be duplicated and stored in the archiving server (https://dma.embl.de/) for long-term storage and will be reusable upon reasonable request. All published results will be made accessible in pre-processed format corresponding to the data from each published figure, through the institutional research data repository of the KU Leuven.
When will the data be made available?	☒ Upon publication of research results ☐ Specific date (specify) ☐ Other (specify)
Which data usage licenses are you going to provide? If none, please explain why. *A DATA USAGE LICENSE INDICATES WHETHER THE DATA CAN BE REUSED OR NOT AND UNDER WHAT CONDITIONS. IF NO LICENCE IS GRANTED, THE DATA ARE IN A GREY ZONE AND CANNOT BE LEGALLY REUSED. DO NOTE THAT YOU MAY ONLY RELEASE DATA UNDER A LICENCE CHOSEN BY YOURSELF IF IT DOES NOT ALREADY FALL UNDER ANOTHER LICENCE THAT MIGHT PROHIBIT THAT.* *Check the RDR guidance on licences for data and software sources code or consult the License selector tool to help you choose.*	☐ CC-BY 4.0 (data) ☐ Data Transfer Agreement (restricted data) ☐ MIT licence (code) ☐ GNU GPL-3.0 (code) ☒ Other (specify) All published data will be made available under a CREATIVE COMMONS ATTRIBUTION LICENSE CC-BY-NC-4.0 and users will be expected to give credit to the creators of the data through citation of the original published work.
Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here. *INDICATE WHETHER YOU INTEND TO ADD A PERSISTENT AND UNIQUE IDENTIFIER IN ORDER TO IDENTIFY AND RETRIEVE THE DATA.*	☒ Yes, a PID will be added upon deposit in a data repository ☐ My dataset already has a PID ☐ No

What are the expected costs for data sharing? How will these costs be covered?	Sharing data has no cost within NERF. NERF uses Globus for sharing data, for which NERF uses the Vlaams Supercomputer Centrum subscription. Also, KU Leuven Research Data Repository allows free storage of up to 50GB. Since the data that will be uploaded will be pre-processed data we do not expect to exceed that amount.

7. Responsibilities	
Who will manage data documentation and metadata during the research project?	The fellowship holder
Who will manage data storage and backup during the research project?	The fellowship holder and promotors Karl Farrow and Santiago Rompani
Who will manage data preservation and sharing?	Karl Farrow and Santiago Rompani
Who will update and implement this DMP?	The fellowship holder