FWO DMP Template

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.

1. General Information	
Name applicant	**Karan Ahuja**
FWO Project Number & Title	**Unravelling neuron-glia interactions in Wolfram syndrome through optic nerve-on-chip and in vivo base editing.**
Affiliation	☒ KU Leuven ☐ Universiteit Antwerpen ☐ Universiteit Gent ☐ Universiteit Hasselt ☐ Vrije Universiteit Brussel ☐ Other:
2. Data description	
Will you generate/collect new data and/or make use of existing data?	☒ Generate new data ☐ Reuse existing data

Describe the origin, type and format of the data (per dataset) and its (estimated) volume *If you **reuse** existing data, specify the **source** of these data.* *Distinguish data **types** (the kind of content) from data **formats** (the technical format).*	We will collect both physical and digital data, the latter being stored in several file formats (docx, excel, tiff, jpg, csv files, etc.), along with the associated metadata files. Digital data will be retained for the expected 5 year period and for most publications we expect that we will make the data publicly available on data repositories, e.g. on open platforms like KU Leuven Research Data Repository (RDR) and the Open Science Framework (OSF). Laboratory notebooks and electronic data will be stored by the PI, Prof. Lieve Moons. Sequencing data will be submitted to public databases (EBI-ENA/NCBI-SRA), where they will be permanently archived to preserve access to the public. Physical data: Freezer stocks of histological slides will be available upon request. **Work package I: To develop an in vitro iPSC-derived RGC-glial cell coculture model for the optic nerve using a microfluidic-microelectrode array integrated system (MF-MEA).** iPSC derived RGC, astrocyte and oligodendrocyte monocultures and their cocultures in microfluidics, will be characterized by qPCR, immunohistochemistry and single nuclei RNA sequencing (snRNAseq). The microscopic images will be stored in different formats (.tif, .jpeg, .png, .lif) along with their metadata files, in KU Leuven Luna drives. The qPCR data files will be stored as .xlx format and data analysis will be done in Microsoft excel. The files will be saved in shared J-drive, one drive and KU Leuven Luna drives. The snRNAseq files will be saved as .fastq format and analysis will be done in Microsoft excel (.xls, .csv) to evaluate the expression of differentially expressed genes. All the files and raw data will be backed up in onedrive from KU Leuven, accessed by applicant's details on KU Leuven portal. **Work package 2: To identify the neural cell type(s) (i.e. neurons, astrocytes, oligodendrocytes) whose dysfunction is caused by mutations in the WFS1 gene and drives WS neuropathology** Healthy cell types will be replaced by mutant cells in different combinations to see the impact of sick cell on healthy cells by snRNAseq and functional assays like multielectrode array. Mutant cells will be characterized as healthy cells (as in WP1) by qPCR, immunohistochemistry and snRNAseq and all the data will be saved in similar way. The proteins levels for ER stress markers in mutant cells, wolframin protein

	levels will be accessed by western blot and the scanned files for it will be saved as PDF format in KU Leuven Luna drives, one drive and shared J-drive. snRNAseq datasets from the cocultures will be saved as .fastq format and analysis will be done in Microsoft excel (.xls, .csv) to determine the differentially expressed genes. **WP3: To provide proof-of-concept for in vivo base editing of the relevant CNS cell types in WS.** In this work package, findings from the previous ex vivo/in vivo studies will be validated in vivo using immunohistochemistry (resulting again in resulting file format are .tiff or .czi and oib. image stacks) and ELISA resulting in excel compatible data. Analysis of the data will be done by softwares like Imaris Bitplane, ImageJ and data visualizations will be done by softwares like Graphpad Prism, adobe illustrator and saved as PDF format in Ku Leuven drives.

3. Ethical and legal issues	
Will you use personal data? If so, shortly describe the kind of personal data you will use AND add the reference to your file in your host institution's privacy register. *In case your host institution does not (yet) have a privacy register, a reference is not yet required of course; please add the reference once the privacy register is in place in your host institution.*	☐ Yes ☒ No If yes: - 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 ☐ No If yes: - Reference to ethical committee approval: We will use experiments on human-derived induced pluripotent stem cells and mice. The research will be performed under normal laboratory safety rules. All necessary safety measures for laboratory and animal work will be taken. For use of healthy humans or patient derived stem cells in the research, we will follow the guidelines and rules from the HSE Department (Health, Safety and Environment) and the Animal Ethics Committee at KU Leuven. The Ethics Committee Research UZ / KU Leuven: S52426 The Ethical Committee for Animal Experimentation (ECD) will be requested in a later period of the project.
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?	☒ Yes ☐ No If yes, please comment: The uniqueness and value of the project is that it targets both problems parallelly by creating an iPSC based in vitro optic nerve-model on-chip to understand cellular crosstalk, as well as application of in vivo base editing to correct the genetic defect in WS patients. Therefore, it possesses high strategic potential and novel and promising for clinical application. Possible IP protection will be considered, which will then be performed in consultation with LRD and VIB.
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?	☐ Yes ☒ No If yes, please comment:

4. Documentation and metadata	
What documentation will be provided to enable understanding and reuse of the data collected/generated in this project?	Documentation and metadata linked to each experiment will be documented by research groups in hard copy lab notebooks in this project. This includes the research design, protocol, context of data collection, data collection methods, quality control procedures, processing and analysis procedures. **Digital data:** -Experimental design and protocol (.docx file) -Steps involved in data analysis and relevant analysis scripts (R, MATLAB, Python, ImageJ and Imaris Bitplane scripts) -Raw data (specific file format according to data type) -Analysed data (specific file format according to data type) **Physical data:** Samples taken from experiments will be documented and stored for up to three years after the end of the project. Storage will be in fixative or in freezers depending on the kind of sample. Immunohistological stained slides will be stored in appropriate boxes in a dry place or freezer.

Will a metadata standard be used? If so, describe in detail which standard will be used. If not, state in detail which metadata will be created to make the data easy/easier to find and reuse.	☐ Yes ☒ No If yes, please specify: We will adopt a single, well-defined file-folder structure and file-naming rules. Every data folder will be accompanied by appropriate metadata files consisting of a readme.txt with info on nomenclature, file format, software and adopted data standards.

5. Data storage & backup during the FWO project	
Where will the data be stored?	The host institute provides a secure data storage system (KU Leuven LUNA servers) with automated onsite back-up and mirroring. Every person has storage capacity of 2 TB with regular backup system (OneDrive) so the data will be stored there for active use and copies can be made and kept on personal devices. For active use of the data during the project, OneDrive will ensure data transfer between computers, and will also be stored on the KU Leuven LUNA Large Volume Storage space. Also, the PI of the laboratory pays for storage space (100 GB) on the network drives of KU Leuven (J drive). The data will be stored there as well. Biological samples will be taken, and stored in labelled fridges, freezers and closets in the lab. The inventory of all locations is shared on the KU Leuven LUNA Shared drive.
How will the data be backed up?	The data will be stored on the university's central servers (OneDrive) with automatic daily backup procedures.

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:
What are the expected costs for data storage and backup during the project? How will these costs be covered? *Although FWO has no earmarked budget at its disposal to support correct research data management, FWO allows for part of* ***the allocated project budget*** *to be used to cover the cost incurred.*	Back-up cost per Tb (KU Leuven ICTS): 295€/year Expected amount of data (5 Tb). Digital vault for private data: windows server (KU Leuven ICTS): 1302 €/year 100 GB network drive (J drive): 51,9 €/year The costs will be covered by part of the allocated project budget.
Data security: how will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?	All storage spaces (OneDrive and J drive) is hosted in the KU Leuven ICTS data center, with a mirror in the second ICTS centre. They are accessible only with my KU Leuven credentials, that provides disaster recovery and additional back-up capacity with guaranteeing long-term data availability.

6. Data preservation after the end of the FWO project FWO expects that data generated during the project are retained for a period of minimally 5 years after the end of the project, in as far as legal and contractual agreements allow.	
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, ...).	Digital data will be retained for the expected 5 year period and for most publications we expect that we will make the data publicly available on data repositories. Laboratory notebooks and electronic data will be stored by the PI, Prof. Lieve Moons. Sequencing data will be submitted to public databases (EBI-ENA/NCBI-SRA), where they will be permanently archived to preserve access to the public. Physical data: Freezer stocks of histological slides will be available upon request. After the conclusion of the project samples will be stored for up to three years after the end of the project. Storage will be in fixative or in freezers depending on the kind of sample.

Where will these data be archived (= stored for the long term)?	Digital data: KU Leuven LUNA servers Physical data: Notebooks and publications: Laboratory repository
What are the expected costs for data preservation during these 5 years? How will the costs be covered? *Although FWO has no earmarked budget at its disposal to support correct research data management, FWO allows for part of* ***the allocated project budget*** *to be used to cover the cost incurred.*	1200 EUR/year

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)?	☐ Yes ☒ No If yes, please specify:
Which data will be made available after the end of the project?	Sequencing data will be submitted to public databases (EBI-ENA/NCBI-SRA), where they will be permanently archived to preserve access to the public. Written progress reports, thesis will be stored for internal purposes and can be accessed by KU Leuven researcher upon request. For most publications we expect that we will make the data publicly available on data repositories.
Where/how will the data be made available for reuse?	☒ In an Open Access repository ☐ In a restricted access repository ☐ Upon request by mail ☐ Other (specify):
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?	Published data are accessible to all. Only research personnel of the lab can access the data and metadata generated during the project.

What are the expected costs for data sharing? How will these costs be covered? *Although FWO has no earmarked budget at its disposal to support correct research data management, FWO allows for part of **the allocated project budget** to be used to cover the cost incurred.*	The expected cost for data sharing will be low, since the use of OneDrive is free for KU Leuven members up to 1TB.

8. Responsibilities	
Who will be responsible for the data documentation & metadata?	Responsibility for generating data and ensuring data preservation and sharing is with the supervisors (Lieve Moons, Catherine Verfaillie, Lies De Groef) and myself.
Who will be responsible for data storage & back up during the project?	Supervisors (Lieve Moons, Catherine Verfaillie, Lies De Groef) and myself.
Who will be responsible for ensuring data preservation and sharing?	Supervisors (Lieve Moons, Catherine Verfaillie, Lies De Groef) and myself.
Who bears the end responsibility for updating & implementing this DMP? *Default response: The PI bears the overall responsibility for updating & implementing this DMP*	Supervisors (Lieve Moons, Catherine Verfaillie, Lies De Groef) and myself.