DMP FWO 1SE4422N

Project Name : Unraveling the pathology of the novel congenital myasthenic syndrome-22 (CMS22) and investigation of molecular links with Prader-Willi syndrome.

Principal investigator : Prof Dr. John Creemers

Description : Inactivation of PREPL, a gene located on chromosome 2 encoding the prolyl endopeptidase-like (PREPL) protein, leads to the novel congenital myasthenic syndrome-22 (CMS22). This syndrome is characterized by hypotonia and growth impairment in children. Later, CMS22 develops into hyperphagia and obesity. These phenotypes share striking similarities with Prader-Willi syndrome (PWS) and most patients are initially misdiagnosed with PWS. Our group has been on the forefront in establishing CMS22, developing new diagnostic assays and treatment plans as well as unraveling of the biological function of PREPL. However, much of the cellular function of PREPL and its molecular connection with PWS remains unknown. Therefore, this project will focus on unraveling PREPL's cellular function in cell culture models and knockout mice. In addition, I will assess the effect of patient point mutations on PREPL's catalytic and non-catalytic functions as point mutations are understudied, but most common, in CMS22 patients. Furthermore, I will investigate molecular links between CMS22 and PWS and, in collaboration with Dr. Florian Merkle (University of Cambridge, UK), I will unravel PREPL's function in hypothalamic neurons, a main cell type involved in metabolic dysregulation of both diseases. Clarifying the cellular function of PREPL and the contribution of PREPL in PWS will be a breakthrough which will lead to improved diagnosis and novel treatment plans.

1. General information

Name applicant
Yenthe Monnens

FWO Project Number & Titel
FWO 1SE4422N
Unraveling the pathology of the novel congenital myasthenic syndrome-22 (CMS22) and investigation of molecular links with Prader-Willi syndrome.

Affiliation
KU Leuven

2. Data description

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

Type of Data	Format	Volume	How created
Analysis of western blot images	xls, .pzfx	50- 200MB	Numerical data. Quantification of western blot images, performed using imageJ, in microsoft excel and graph pad prism.

Western blot images	.JPEG	1-5 GB	Immages of chemiluminescent signal on western blot development film
Analysis of confocal images	.xls, .pzfx	50- 200MB	Quantification of confocal image data performed using imageJ, in microsoft excel and graph pad prism.
Confocal images of HEK293T cell lines	tiff	5GB – 20GB	Confocal images of HEK293T cells taken with Nikon C2 microscope
DNA sequencing files	.ABI	500-1000MB	Sequencing of plasmids by genomics core Leuven
Figures of data for publication	.JPEG	5 – 20GB	Figures of amalgamated data produced during the project
Lab books		3-5 Books	Dated written notes associated with carrying out experimental procedures
Microscopy slides	Glass microscopy slides	50-200	Microscopy slides used during imaging, consisting of formaldehyde-fixed cells immunostained.
PCR gel images	.JPEG	10-50MB	Immages of DNA samples run on agarose gells.
Plotted graphs .pzfx	.pzfx	200- 500MB	Graphs of data from .xls files produced using GraphPad prism
Text for publication and Thesis	.Docx .PDF	1-5GB	Text files associated with publications or thesis

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

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)

No

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?

Analysis of western blot images	Names of analysed images will be stored as part of the image analysis excel files and annotated accordingly
DNA plasmids	Sequence and details of plasmids will be stored digitally on the lab sever. Details of construction will be stored in the lab book.
Figures of data for publication	Names of source images and source data will be stored with the created final figures.
Confocal microscopy images	Dimensions, image type, and microscope settings will be described in the lab book protocol.
Lab Books	Lab books will be stored in a fixed location in the lab
Western blot images	The methodology and protocol will be described in the lab book.
PCR gel images	The methodology and protocol will be described in the lab book.
Analysis of confocal images	Regions of interest will be annotated on the image or in the metadata.

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

Cell lines, plasmids, primers, antibodies, isolated tissues, ... are filed in a MS Access database that is available in a folder shared by the members of the research group. Each database contains structured information on the source of the sample, storage place, the investigator, date, experiment description,

... The provided information allows quick reference to the lab notebooks, where the specific experiments are descibed with more detailed parameters (protocol, sample names, condtions, ...)

5. **Data storage and backup during the FWO project Where will the data be stored?**

All other electronic files (text documents, images, sequences): will be stored on KU Leuven servers, with hourly on-site backup and mirroring or stored on a cloud-based service offered by KU Leuven (OneDrive). In addition data will be regularly backed -up and stored on an external harddrive.

All samples will be stored as appropriate: -80°c for nucleic acids and protein samples, bacteria used for cloning and enzyme inhibitor. DNA Vectors, antibodies and enzymes will be stored at -20°c. Other biological and chemical samples will be stored at 4° C.

How is backup of the data provided?

The data will be stored on the KUL server with automatic backup procedure. Data is also stored on an external harddrive of the research unit.

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, There is sufficient storage up to 1TB left across the KU Leuven server and onedrive.

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

Yearly cost : € 519/TB Costs will be covered by the project budget. The total amount of data will be significantly less than 1TB

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

Data on the researcher's hard drive will only be accessible by the researcher (protected by KU Leuven login). Data on the secured KU Leuven server will only be accessible by the members of the research unit. Office door is locked for non-lab members.

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, ...).**

The minimum preservation term of 5 years after the end of the project will be applied to all datasets.

Where will the data be archived (=stored for the longer term)?

All digital data will be stored on the "J-Drive". Biological samples will be stored locally in the laboratory at appropriate storage temperature (4°C; -20°C; -80°C°).

What are the expected costs for data preservation during the retention period of 5 years? How will the costs be covered?

The costs of the storage of 1-2 TB data for 5 years on KU Leuven servers are maximally €1737.80. These cost will be met partially by the benchfee provided by the FWO and partially by the existing lab grants.

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?

The data will be published in research journals to communicate them to peers and a wide audience. All data supporting publications will be made openly accessible.

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

In an Open Access repository

Upon request by mail

As a general rule, datasets will be made openly accessible via existing platforms that support FAIR data sharing (www.fairsharing.org). Sharing policies for specific research outputs are detailed below:

- Research documentation: All protocols used to generate published data will be described in the corresponding manuscript(s), and the related documentation will be included as supplementary information. These data and all other documents (daily logs, raw data) are accessible to the PI and the research staff, and will be made available upon request
- Manuscripts: All scientific publications will be shared openly. Manuscripts submitted for publication will be deposited in a pre-print server such as bioRxiv, arXiv, Nature Precedings or ASAPbio).
- Antibodies, synthetic and recombinant compounds: samples will be stored as appropriate in the laboratory. Within availability, they will be shared with This document was generated by DMPonline (http://dmponline.dcc.ac.uk) 12 of 145 interested researchers upon request.

When will the data be made available?

Upon publication of the research results. All research outputs will be made openly accessible at the latest at the time of publication. No embargo will be foreseen unless imposed e.g. by pending publications.

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

Whenever possible, datasets and the appropriate metadata will be made publicly available through repositories that support FAIR data sharing.

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

Data management costs will be covered by the laboratory budget.

8. **Responsibilities**

Who will be responsible for data documentation & metadata?

Metadata will be documented by the research and technical staff at the time of data collection and analysis. The lab book will be used to document all metadata surrounding an experiment.

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

The research and technical staff will ensure data storage. The PI is responsible for all final data.

Who will be responsible for ensuring data preservation and reuse ?

The PI is responsible for data preservation and sharing, with support from the research and technical staff involved in the project.

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

The PI bears the end responsibility of updating & implementing this DMP.