

1. General Information	
Name applicant	Hans Van Oosterwyck
FWO Project Number & Title	<b>G0C2422N: Leaky vessels in the brain – unraveling disturbed mechanotransduction in Cerebral Cavernous Malformations</b>
Affiliation	<input checked="" type="checkbox"/> KU Leuven <input type="checkbox"/> Universiteit Antwerpen <input type="checkbox"/> Universiteit Gent <input type="checkbox"/> Universiteit Hasselt <input type="checkbox"/> Vrije Universiteit Brussel <input type="checkbox"/> Other:
2. Data description	
Will you generate/collect new data and/or make use of existing data?	<input checked="" type="checkbox"/> Generate new data <input type="checkbox"/> Reuse existing data

<p>Describe the origin, type and format of the data (per dataset) and its (estimated) volume</p> <p><i>If you <b>reuse</b> existing data, specify the <b>source</b> of these data.</i></p> <p><i>Distinguish data <b>types</b> (the kind of content) from data <b>formats</b> (the technical format).</i></p>	<p>The following types of data will be generated over the 4-year course of the project:</p> <ol style="list-style-type: none"> <li>1. (Traction force) microscopy related Type and format: microscopy image data sets (digital, .lif files), computational codes (digital, .m files), processed image datasets (digital, .pvd files), hydrogel mechanical test results (digital, .xls, .csv files) Volume: 2-5 GB/ combined dataset, around <b>2 TB</b> data expected over the project duration</li> <li>2. In vitro device-related Type and format: CAD designs of devices (in vitro chambers) (digital, SolidEdge .par, .asm, and .stl, .step files), computational flow models (digital, .mph files), flow chambers (physical) Volume: few MBs/ CAD design, few MBs/ computational model, total expected digital data volume around <b>10 GB</b></li> <li>3. Cell biology related Type and format: commercially available human primary endothelial cells (physical), genetically modified endothelial cells (physical), Microscope images and analysis thereof (.czi, .tiff, .xls, .csv, .zvi, .jpg), Flow cytometry data (.fcs, .wsp, .xls, .csv, .xml); (Single cell) RNA sequencing data (.fastq, .gz, .bam), Bioinformatic analysis (.r); drawings and figure composition files (.ai, .eps, .pdf, .indd). Volume: around <b>1 TB</b> digital data expected over the project duration</li> </ol> <p>In addition, for all parts of the project, electronic lab note books, experimental protocols, experimental conditions and other metadata will be generated, which will be digitally stored as far as possible, making future searching through and sharing easier. <b>1 GB</b> storage space should easily suffice for this for the entire project duration.</p>
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### 3. Ethical and legal issues

<p>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.</p> <p><i>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.</i></p>	<p><input type="checkbox"/> Yes  <input checked="" type="checkbox"/> No</p> <p>If yes:</p> <ul style="list-style-type: none"> <li>- Privacy Registry Reference:</li> <li>- Short description of the kind of personal data that will be used:</li> </ul>
<p>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).</p>	<p><input type="checkbox"/> Yes  <input checked="" type="checkbox"/> No</p> <p>If yes:</p> <ul style="list-style-type: none"> <li>- Reference to ethical committee approval:</li> </ul>
<p>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?</p>	<p><input type="checkbox"/> Yes  <input checked="" type="checkbox"/> No</p> <p>At this point, IP potential data generation is not expected. DMP will be updated if valorisation potential is identified in the future.</p>
<p>Do existing 3<sup>rd</sup> 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?</p>	<p><input type="checkbox"/> Yes  <input checked="" type="checkbox"/> No</p> <p>If yes, please comment:</p>

#### 4. Documentation and metadata

What documentation will be provided to enable understanding and reuse of the data collected/generated in this project?	The main results and methods will be published in peer-reviewed journals. All generated data and metadata (experimental conditions, protocols used, reagents used, cells used) will be archived digitally. All groups have templates for writing protocols, and templates for excel spreadsheets for raw data and data analysis. When we upload raw data to repositories, we will affix keywords and a readme file with the needed information for reuse. KU Leuven's private Gitlab repository will be used for version control and ease of sharing of computational codes (made available at <a href="https://gitlab.kuleuven.be/MAtrix">https://gitlab.kuleuven.be/MAtrix</a> ). Sequencing data (if not interesting for IP) will be uploaded to the GEO repository.
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.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, please specify: The metadata will be a combination of machine generated metadata (e.g. imaging conditions stored by the microscope software), standard operation procedures (SOP's), and lab journal records detailing all other relevant experimental details. The metadata will be included as keywords and all information about the data into readme files inserted with each dataset. The sequencing data will be uploaded to the GEO repository using the MIAME standard.

## 5. Data storage & backup during the FWO project

Where will the data be stored?	All data other than the large volume data sets (microscopy images, processed images and sequencing data) will be stored locally on the researcher's computer, while being constantly synced to KU Leuven OneDrive. Large volume data sets will be stored in the KU Leuven archiving drive (K: drive) in case of the sequencing data, or on the KU Leuven Large Volume Storage drive (L: drive) in case of the image data.
How will the data be backed up?	The researcher's computers will be permanently synced using KU Leuven OneDrive (cloud service available per KU Leuven researcher) and the data on the network drives is kept secure and backed up by the university ICTS services. When a dataset will no longer be modified (e.g. after publication of manuscripts), archiving to a read only network drive (KU Leuven K: drive) will be done to maintain a copy.

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.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <p>Each researcher will have cloud storage space using KU Leuven OneDrive, covering all requirements other than the large volume datasets. The large volume datasets (primarily microscopy images and sequencing data, both raw and processed) will amount to an estimated total of <b>3 TB</b> over the project duration (sequencing data <b>1 TB</b>, raw and processed image data sets <b>2 TB</b>). This data will be partially stored on the KU Leuven K: drive and L: drive during the course of the project and archived on the KU Leuven K: drive after the end of the project. The microscopes are directly connected to the KU Leuven Network L: drive, facilitating this storage. The storage capacity for digital data on the secured and backed up KU Leuven servers hosting the K: and L: drives is extendable by blocks of 100 GB and 5 TB respectively (read only K: drive @ 6.4€/yr. and read-write capable L: drive @ 128.39€/yr./TB). Hence, by acquiring storage space based on the project requirements, sufficient storage will be available.</p>
<p>What are the expected costs for data storage and backup during the project? How will these costs be covered?</p> <p><i>Although FWO has no earmarked budget at its disposal to support correct research data management, FWO allows for part of <b>the allocated project budget</b> to be used to cover the cost incurred.</i></p>	<p>Storage space on the KU Leuven K: and L: drives will be acquired based on project needs. This cost is estimated at ~<b>2600 €</b> (for a 5 TB block on the L: drive for 4 years @ 128.39 €/yr./TB) and will be covered from the project consumables budget.</p>
Data security: how will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?	<p>Storage on university network drives are secure data storage solutions with security services managed by the University ICTS department. They provide the options to control data access by authorised persons and maintain backups in secure physical locations. The above-mentioned storage sites are compatible with GDPR regulations</p>

## 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, ...).	All digital data and metadata will be retained for at least 5 years. Where possible and deemed useful, aliquots of cells used and their genetically modified versions will be kept stored under cryopreservation.
Where will these data be archived (= stored for the long term)?	All digital data will be archived on KU Leuven K: drive.
What are the expected costs for data preservation during these 5 years? How will the costs be covered?  <i>Although FWO has no earmarked budget at its disposal to support correct research data management, FWO allows for part of <b>the allocated project budget</b> to be used to cover the cost incurred.</i>	The archiving hard drives (KU Leuven K: drive) cost 6.4€/yr per 100 GB. So <b>1000 €</b> would allow the consortium to jointly have 3 TB storage on the KU Leuven K: drive for 5 years after the project ends. This will be covered from the consumables budget of the project.

## 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 3 <sup>rd</sup> party, legal restrictions)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, please specify:
Which data will be made available after the end of the project?	The main findings of the research with all supporting processed data will be made available via publications in peer-reviewed journals. Publishing all raw data associated with published manuscripts on Zenodo (free of cost repository hosting up to 50GB data) will be considered.

Where/how will the data be made available for reuse?	<input checked="" type="checkbox"/> In an Open Access repository <input type="checkbox"/> In a restricted access repository <input checked="" type="checkbox"/> Upon request by mail <input type="checkbox"/> Other (specify): A Gitlab repository will be used for sharing computational codes. Publicly accessible GEO repository will be used for the publishable sequencing data.
When will the data be made available?	The findings will be made available as publications at logical points during the project when the research questions have been sufficiently addressed. The other data would be made available upon request, where considered appropriate, after the publications.
Who will be able to access the data and under what conditions?	The supervisors and the researchers will have access to all the generated data. The data in the publications will be publicly available (at a cost though, if the journals require so). The availability of the other data to any requestor will be dealt with on a case-by-case basis. If a valid scientific or societal benefit and non-profit reason exists, the data will be freely shared, except to direct competitors.
What are the expected costs for data sharing? How will these costs be covered?  <i>Although FWO has no earmarked budget at its disposal to support correct research data management, FWO allows for part of <b>the allocated project budget</b> to be used to cover the cost incurred.</i>	No costs for digital data sharing are foreseen. For sharing other materials, Material Transfer Agreements (MTA's) will be mutually signed and the shipping costs would be covered by either party as it is not expected to be high. Any significant sharing costs will be expected to be borne by the requestor.

## 8. Responsibilities

Who will be responsible for the data documentation & metadata?	The experimental researchers will be responsible for the documentation and the metadata.
Who will be responsible for data storage & back up during the project?	The researchers and the supervisors will jointly ensure proper data storage and back up during the project.
Who will be responsible for ensuring data preservation and sharing?	Prof. Hans Van Oosterwyck, Prof. Susana Rocha, dr. Eva Faurobert for the datasets generated by their respective groups

<p>Who bears the end responsibility for updating &amp; implementing this DMP?</p> <p><i>Default response: The PI bears the overall responsibility for updating &amp; implementing this DMP</i></p>	<p>Prof. Hans Van Oosterwyck</p>
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