THE ROLE OF TRPM3 IN THE DEVELOPMENT OF PATHOLOGICAL PAIN - FROM THE PERIPHERY TO THE BRAIN

A Data Management Plan created using DMPonline.be

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Project abstract:

Acute pain is a natural alarm response, which alerts us for potential injury, and motivates actions to protect affected body parts. However, in chronic pain patients, pain outlasts its alarm function and becomes a disease unto itself. An estimated 20% of the population suffer from moderate-to-severe chronic pain, with strong impact on health and wellbeing and immense societal costs. Pharmacological treatments are often unsatisfactory: non-opioid analgesics such as non-steroidal
antinflammatory drugs or gabapentinoids are effective in only a limited number of patients, whereas opioids can have severe adverse effects including the risk of addiction and overdose. Thus, there is a high, unmet need for new, safe strategies to alleviate pathological pain.
Research pioneered by the main applicant has revealed that genetic ablation or pharmacological inhibition of the ion channel TRPM3 counteracts hypersensitivity and ongoing pain in animal models of inflammatory and neuropathic pain. TRPM3 is expressed in different cells in the pain pathway, including not only primary sensory neurons but also satellite glia cells in the sensory ganglia. In this project, we will use a multifaceted approach, from molecular and cellular studies to in vivo imaging
of brain activity and facial expression in mice, to pinpoint where and how TRPM3 contributes to pathological pain. These studies may lead to a better understanding of chronic pain and aid the
development of new pain treatment strategies.

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FWO DMP (Flemish Standard DMP)

1. 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.

				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
		Please choose from the following options: • Generate new data • Reuse existing data	*Please choose from the following options:* • Digital • Physical	*Please choose from the following options:* • Observational • Experimental • Compiled/aggregated data • Simulation data • Software • Other • NA	*Please choose from the following options:* • .por, .xml, .tab, .csv,.pdf, .txt, .rtf, .dwg, .gml, … • NA	*Please choose from the following options:* • <100MB • <1GB • <100GB • <1TB • <5TB • <10TB • <50TB • >50TB • NA	
vfUSI recordings	Ultrasound imaging of mouse brain	Generate new data	Digital	Experimental	.mat	<50 TB	
Spatial transciptomics	Spatial transcriptomics data of mouse sensory ganglia	Generate new data	Digital	Experimental	.xml .csv	<1TB	
Calcium imaging	Calcium imaging of sensory ganglia	Generate new data	Digital	Experimental	.tif .nd2	<1TB	
patch clamp	patch clamp recordings of whole cell currents	Generate new data	Digital	Experimental	.csv	<1GB	
behavioral data	movies of mouse behavior	Generate new data	Digital	Experimental	.tif	<1TB	

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)? Describe these

issues in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes, animal data

The use of laboratory animals in this project is covered by the already approved ECD projects. Extra animals, addition of new experiments and changes in experimental techniques can be submitted as an amendment to this ECD project.

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- 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.

- Yes

The entire dataset or part of the project may contain findings that have tech transfer potential.

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 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

2. 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).

-All experiments will be documented using an Electronic Lab Notebook (eLABFTW), which willcontain all the details of the experimental protocols and procedures along with the reference to the relevant data files, and which will be time-stamped.
- All preclinical experiments are performed according to protocols of LICR (Lab of Ion channel research), which are embedded into eLABFTW.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- Yes

For preclinical data:

Metadata will include the following elements:
• Title: free text
• Creator: Last name, first name, organization
• Date and time reference
• Subject: Choice of keywords and classifications
• Description: Text explaining the content of the data set and other contextual information
needed for the correct interpretation of the data, the software(s) (including version number) used to produce and to read the data, the purpose of the experiment, etc.
• Format: Details of the file format
• Resource Type: data set, image, audio, etc.
• Identifier: DOI (when applicable)
• Access rights: closed access, embargoed access, restricted access, open access.
Additionally, we will closely monitor MIBBI (Minimum Information for Biological and Biomedical Investigations) for metadata standards more specific to our data type. For datasets, additional metadata will be associated with the data file as appropriate.

3. Data storage & back-up during the research project

Where will the data be stored?

During the project: Digital files will be stored on KU Leuven servers. Metadata and notes are stored via ELN.
After the project: Digital files and meta data will be stored on MaNGO.

How will the data be backed up?

Data stored on the KU Leuven servers are backed up daily using snapshot technology, where all incremental changes in respect of the previous version are kept online; the last 14 backups are kept.

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 currently sufficient access to space on the KU Leuven servers to conduct the project.
The KU Leuven Large Volume Storage has a capacity of 6 PB. If necessary, more space will be purchased in blocks of 5 TB.

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

Raw data are stored on the KU Leuven Large Volume Storage service and secured by KU Leuven security groups. Analyzed data are stored on password-protected KU Leuven personal computers and hard drives.

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

Expected costs for data storage are estimated at 4500 euro/3 years. These costs will be covered by the host labs

4. 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...).

All digital data (raw, processed and metadata) will be retained for at least 5 years after the end of the project in a safe, secure & sustainable way for purposes of reproducibility, verification, and potential reuse.

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

After processing and publication, data and metadata will be saved in the KU Leuven ManGO: active data management platform.

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

The costs for preservation on ManGO after ending the project will be covered by the host labs. Estimated costs are 1000 Euro/year.

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- Yes, in a restricted access repository (after approval, institutional access only, …)

All the virtual data will be made available for members of the host lab. The decision to share the content and/or reuse of the data by external researchers will be made by the supervisor of the project.
After publication of the research results, data will be fully available upon request.

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

Access will be provided by the promotor or copromotor of the project: Thomas Voets & Clement Brunner

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 in the comment section 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.

Following publication, data will be made available via established depositories, depending on the type of data and the requirement of publishers or other agencies.

When will the data be made available?

-Data is made available to members of the host laboratory during the project.
-For external researchers/groups, data will be made fully available upon publication of the research results.

Which data usage licenses are you going to provide? If none, please explain why.

Data from the project that can be shared will be made available under a creative common's attribution license (cc-by 4.0), so that users have to give credit to the original data creators.

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- No

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

Minimal/no costs are expected.

6. Responsibilities

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

Thomas Voets & Clement Brunner

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

Andrei Segal Stanciu and Clement Brunner

Who will manage data preservation and sharing?

Andrei Segal Stanciu and Clement Brunner are responsible for data preservation. Thomas Voets and Clement Brunner are responsible for data reuse/sharing.

Who will update and implement this DMP?

Thomas Voets & Clement Brunner