Targeting ATP13A3 for neuroblastoma therapy

A Data Management Plan created using DMPonline.be

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Project abstract:

Combination therapy of targeting polyamine synthesis (with DFMO) and cellular uptake has been successful in pre-clinical neuroblastoma models, and is currently being tested in phase I clinical trials. Our team identified a role for the polyamine transporter ATP13A3 in neuroblastoma. ATP13A3 is linked to worse outcome in patients, whereas other preliminary evidence flags ATP13A3 as the main transporter impacting polyamine uptake and neuroblastoma proliferation. We therefore, propose that targeting ATP13A3 represents a selective therapeutic approach. Via high-throughput screening and rational design we will identify hits that selectively block ATP13A3. Complementary, we will design toxic polyamine analogs that are selectively taken up by ATP13A3-expressing tumor cells. Our project will offer partnership and licensing opportunities with industry, and may be extended to other difficult-to-treat cancer types relying on ATP13A3, such as pancreatic cancer.

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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.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
		Indicate: ***N****(ew data) or* ***E****(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
experimental	Protein gel pictures	N	D	I	tiff, jpg, png	<1GB	
experimental	Western blotting pictures	N	D	I	.scn	<100GB	
experimental	Flow cytometry	N	D	SO	.fcs, .pdf	<100GB	
experimental	Plate reader	N	D	T	.xlsx	<100GB	
experimental	Cell lines	N	P				<50 cell lines
experimental	compounds	N	P				<200 cpds
Experimental, observational	Notebook, meeting slids	N	D	SO	.one, pptx	<10GB	
experimental & compiled	Structures	N	D	I, SO	pdb, .cif.gz, .pdf, .jpg, .png	<100GB	
	Existing data	E	D, P			<100GB	<20 cell lines

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:

Cell lines and data generated from previous work with DOI https://doi.org/10.1101/2024.02.20.58116.
Human cell lines involved in the project are registered in the departmental biobank S63808, which is updated yearly.

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.

- No

Will you process personal data? 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).

- 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

Favorable compounds developed from this project will be considered for drug repurposing or for follow-up in hit-to-lead projects together with CD3 or other industrial partners (not part of this project). Another goal of the program is providing proof-of-concept for screening, which when successful, allows us to engage in partnerships with CD3 and/or industrial partners (e.g. Aminex Therapeutics) to screen larger libraries. The combination of purified protein, HTS assays and a hit validation cascade is attractive for industrial partnerships.

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or 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

There are no third party agreements that restrict exploitation of the data which is the primary aim of this project.

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

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).

Protocols, list of plasmids, list of antibodies, list of cell lines are available on the j-drive for everybody from the lab. Each researcher has a personal e-notebook that contains the title of the experiments, date and to which project it belongs. Adjustments to the protocol are written in the lab notebook and also how data were generated: the composition, temperature, incubation and and reference to the loading conditions of the considered material. Also, the place where the material is being stored are mentioned in the lab notebook. The read out, raw data, analyzed data, statistics, all data are being saved on the researcher's folder on the j-drive. The name of the folder of the saved data refers to the date, project, specifications and version of the data. All folders are organized on the j-drive according to the project, results, proposal, papers, presentation, administration. Each researcher has access to his/her folder on the j-drive and a common folder of the lab. Only the PI and the lab manager have access to all folders.

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.

- No

The researchers use a OneNote (e-notebook) dedicated for this project. It contains a list of tabs indicating type of experiments. Within each tab, the notes are organized by date of experiments and contain detailed information of each experiments, including date, title, experiment temperature, concentration of reagents, timing, adjustments from a previous protocol if there is any, and the exact protocol if a new experiment has been initiated.The raw data and analysis files are stored in personal J-drive folders under this project. Organized in the same manner as in the notebook. It contains subfolders per type of experiment, and within the subfolder, the data from individual experiments organized by date of conduction. Common information including SOP, cell line information, protein sequences is stored in a common J-drive folder of the lab.

Each member has access to their own personal folder, the common lab folder and OneNote. The PI and the lab manager have access to all folders.

Data Storage & Back-up during the Research Project

Where will the data be stored?

- Shared network drive (J-drive)
- OneDrive (KU Leuven)

Each researcher will store his/her data on their personal folder on the j-drive. This is our data repository for short term storage which is expandable, fast and the data can be modified by the researcher itself. Only the PI and the lab manager have access to all the folders of the jdrive.
The common data storage concerning cell lines, plasmids, antibodies is in a folder under the j-drive and is under restricted authorization. All members of the lab can read these files, but changes can only be made by the persons with authorization
When data is published, the data will be moved to our k-drive. This is our repository for data archiving, for long term storage. Only the PI and the lab manager can move the data to this drive, but data on this drive cannot be modified or deleted. Only the ICT service can do this.

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, explain how this will be taken care of.

- Yes

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

Data are not saved locally on laptop/desktop but are stored in the KU Leuven secure data center. Only two people have access to all folders: the PI and the lab manager. Changes in the shared OneNote made by another team member will be automatically indicated with the name of the person, and older versions can be restored if needed. Each researcher has access to his own personal folder and the project folder he/she is involved in on the j-drive, and has read only access to the data on the long-term storage (k-drive). Non-authorized persons can't access or modify the data.

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

Each year €173.40 will be charged from our ICT service for the use of 1 TB on the k-drive (long term storage) and €519.00 will be charged each year for the use of 1 TB of the j-drive (short term storage). Back-up service is included in the price. These costs were foreseen in the application and if more the lab budget will be used to cover these expenses.

Data Preservation after the end of the Research Project

Which data will be retained for 10 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 data will be preserved for 10 years according to KU Leuven RDM policy

Once the research is completed, all original data and summary/report files will be grouped and collected at the k-drive and will stay there for at least 10 years after the project.
Raw data and analysis files will be stored under the folder of the researcher. When the researcher leaves the lab, these data will be moved to the k-drive.

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

- Large Volume Storage (longterm for large volumes)

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

Each year €173.40 will be charged from our ICT service for the use of 1 TB on the k-drive (long term storage), back-up service is included in the price. These costs were foreseen in the budget request of the application and if more, the lab budget will be used to cover these expenses.

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.

- Yes, as restricted data (upon approval, or institutional access only)

The data about newly developed AT13A3 inhibitors will be restricted untill patents are filed.

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

Researchers involved in this project will be able to access the structral data.

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, intellectual property rights

The aim is to protect exploitable data via a patent application in the future.

Where will the data be made available?

If already known, please provide a repository per dataset or data type.

- Other data repository (specify below)

Publishable data not related to exploitation will be made available as follows:
DNA plasmids: Addgene
Experimental data sets and associated readme files involved in a publication: zenodo

Experimental protocols: protocols.io

When will the data be made available?

- Upon publication of research results

Which data usage licenses are you going to provide?

If none, please explain why.

- CC-BY 4.0 (data)

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- Yes, a PID will be added upon deposit in a data repository

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

It will be covered by the current grant

Responsibilities

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

During the research, individual co-workers are responsible to collect and store data on a dedicated personnel j-drive. The data will be reviewed by the principal investigator.

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

Peter Vangheluwe and the ICT service at KU Leuven

Who will manage data preservation and sharing?

LCTS: Marleen Schuermans and Peter Vangheluwe
Verhelst Lab: Steven Verhelst

Who will update and implement this DMP?

Peter Vangheluwe