2PROLONG: better preservation and early outcome prediction of donor kidneys

A Data Management Plan created using DMPonline.be

Creator: Ina Jochmans

Affiliation: KU Leuven (KUL)

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Principal Investigator: Ina Jochmans

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Project abstract:

Kidney transplantation is hampered by organ shortage. Too many donor kidneys are not transplanted because (1) safe prolonged preservation is not possible, (2) no reliable tools for pre-transplant viability assessment exist, (3) ischemia- reperfusion injury cannot be treated.

2PROLONG will tackle these unmet needs by further developing kidney perfusion as a preservation and viability assessment platform. Nutrient metabolism during kidney perfusion is central in this project.

In Part 1, we will design a preservation solution that supports the nutritional needs of the kidneys during cold kidney perfusion, supporting preservation for up to 3 days.

In Part 2, we will pioneer whole organ spatial localisation of nutrient consumption in the kidney which will in future lead to the discovery of novel metabolic targets to prevent or treat ischemia reperfusion injury.

In Part 3, we will validate our viability biomarkers identified during warm perfusion of pig kidneys in 2 human transplant cohorts.

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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	
Donor data	Data of organ donor (animal/human)	N	P and D	N, T and I	.xlsx .jpg .tiff	<1GB	2 to 3 A4 pages per experiment
Perfusion parameters	Perfusion parameters (pressure, flow, temperature, pO2,...)	N	D	N	.xlsx .html	<1GB	
Biochemical markers	Markers measured in LAG and ABG	N	D and P	N	.xlsx .html	<1GB	1 to 2 A4 pages per experiment
Protein analysis	ELISA	N	D	N	.xlsx	<1GB	
Metabolomics	Mass spectrometry data	N	D	N	.mzML .xlsx	>5TB	
Imaging mass spectrometry	Imaging mass spectrometry	N	D	I and N	.mzML .xlsx .jpg .tiff	>5TB	
Histology	Tissue slices; Image files from microscopes; Semi-quantitative scoring	N	D	N, I and T	.xlsx .jpg .tiff	<1TB	1 to 5 slides per experiment
Data analysis and manuscript preparation		N	D	N, I and T	.xlxs .docx .jpg .tiff .pdf .pzfx	<100GB	

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:

Data from previous animal experiments might be reused (doi.org/10.48804/MAQMAE and doi.org/10.21228/M89Q7K)).

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.

- Yes, human subject data (Provide SMEC or EC approval number below)
- Yes, animal data (Provide ECD reference number below)

- Animal experiments of Part 1: P061/2022
- Animal experiments of Part 2: pending
- Part 3: UZ Leuven Ethics committee (approved s66539)

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).

- Yes (Provide PRET G-number or EC S-number below)

UZ Leuven Ethics committee (approved s66539)

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

If data obtained is of interest for valorization, IP restriction will be claimed. It is not clear from the start what novel relevant markers could be identified or what type of perfusion fluid will be developed.

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.

- Yes

In Part 3 we will analyse samples from transplanted kidneys from Rotterdam, the Netherlands. Data related to the transplant procedures will also be provide.
An MTA and DTA has been signed for these experiments. We will share data where possible.

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).

Data management is provided in either Onenote (used as ELN), Onedrive, or hard copy lab notebooks. We also document in Excel spreadsheets and Word.
Other lab members will have access to the data for the entire duration of the specific project. We guarantee handover of data to the PI upon departure of the involved PhD/postdocs.
We will provide all necessary details that will help others to find the data, including who created or contributed to the data, the title of the dataset, and the date of creation. We will provide supplementary materials to peer-reviewed manuscripts to increase the transfer of all details.

Documentation will also include details on the methodology used, analytical and procedural information, definitions of variables, vocabularies, units of measurement, and the format and the file type of the data.
Generated metabolomics data will be uploaded to NIH Common Fund's National Metabolomics Data Repository (NMDR) website, the Metabolomics Workbench in combination with related metadata to be accessible to the public.

Biochemical data generated in experiments will be uploaded to KU Leuven RDR in combination with related metadata to be accessible to the public.

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.

- Yes

For metabolomics data, the metadata standards of NIH Common Fund's National Metabolomics Data Repository (NMDR) website, the Metabolomics Workbench will be used.

Data Storage & Back-up during the Research Project

Where will the data be stored?

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

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?

All data will be stored in the shared drive of KULeuven for which the access is managed by the lab manager. So access is only granted to people involved in the project.

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

The costs are covered by the project and are in the range of 500 euro/year

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

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

- Shared network drive (J-drive)
- KU Leuven RDR
- Other (specify below)
- Large Volume Storage (longterm for large volumes)

NIH Common Fund's National Metabolomics Data Repository (NMDR) website, the Metabolomics Workbench

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

€51,9/100Gb/year
The costs are covered by project funding

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 open data

With regard to human data, restrictions may apply.

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

For Part 3 MTA and DTA need to be followed.

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, privacy aspects
- Yes, intellectual property rights
- Yes, ethical aspects

Where will the data be made available?

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

- KU Leuven RDR (Research Data Repository)
- Other data repository (specify below)

NIH Common Fund's National Metabolomics Data Repository (NMDR) website, the Metabolomics Workbench

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)
- Data Transfer Agreement (restricted 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?

Open source storage without cost (NIH) or provided by KU Leuven services (RDR).

Responsibilities

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

The PI is responsible for data documentation and metadata.

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

Data storage and backup is managed by the PI together with the lab manager.

Who will manage data preservation and sharing?

PI together with the lab manager.

Who will update and implement this DMP?

PI together with the lab manager.