
C1 Nanoblocks

A Data Management Plan created using DMPonline.be

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Template: KU Leuven BOF-IOF

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Project abstract:

Organs and tissues consist of many cells belonging to different cell types that communicate and/or cooperate with each other and their environment to exert their functions. Hence, investigating cells at scale at diverse levels of the molecular hierarchy and in their in situ tissue context is paramount to develop fundamental understanding of normal development, organogenesis, organ function, aging, and disease processes. However, most current high-resolution spatial (multi-)omics technologies that allow in situ imaging-based characterization of hundreds to thousands of DNA loci, RNA transcripts or proteins are limited to being applied to 2D cell cultures or thin tissue sections (comprised of partial cells by definition), which are incapable of fully displaying the complexity of the 3D cellular interplay.

This project establishes a bespoke end-to-end platform for automated high-resolution spatial (multi-)omics readouts in 3D tissue models, such as organoids, spheroids, assembloids, embryoids, and embryos, or thick tissue samples. It will enable at scale application of spatial (multi-)omics chemistry to these large sample types by leveraging and coupling liquid handling robotics and fluidics for automated sample preparation and processing, together with a bespoke 3D imaging system and high-throughput image analysis. The platform will be established in the KU Leuven Institute for Single Cell Omics (LISCO), through which it will be accessible for the broad research community.

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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: <i>N(ew data) or E(xisting data)</i>	Indicate: D (igital) or P (hysical)	Indicate: Audiovisual Images Sound Numerical Textual Model SOftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
Microscope images		N	D	I	TIFF	<50TB	
Plasmids	sequence	N	P	dna/	FASTA	<1GB	
Crystallography Data		N	D	I/N	CIF	<5TB	

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:

n.a.

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.

- No

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

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).

The file naming system will contain the most important parameters (eg. name, data, stimulus frame, exposure, laser power, ...). All of the data is linked to electronic lab books (One note) with additional notes and observations. Additionally, the image acquisition software automatically saves important metadata.

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 image acquisition software automatically attaches the performed program to the TIFF file, which can later be easily retrieved.

Data Storage & Back-up during the Research Project

Where will the data be stored?

- OneDrive (KU Leuven)
- Other (specify below)

Data will both be stored on Onedrive and external harddrives

How will the data be backed up?

- Personal back-ups I make (specify below)

On other, standalone backup drives.

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

The lab has a large stock of hard drives available, as well as the onedrive space available to all project participants

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

The harddrives are kept in a locked drawer in the office (which is also locked when no one is around. OneDrives are password protected.

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

Estimate up to 20 hard drives (4 TB each). Bench fee or general lab funds are used for the buying of hard drives

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

All of the relevant data will be handed over to the PI by the researchers. The data that eventually ends up in in papers is always uploaded to Zenodo.

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

- Other (specify below)

The lab routinely stores published data on Zenodo.

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

Zenodo is free of charge, and the hard drives are already acquired.

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

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

no restrictions applied

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.

- No

Where will the data be made available?

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

- Other (specify below)
- Other data repository (specify below)

Zenodo.org as it is the host lab preferred platform.
Addgene for the plasmids

When will the data be made available?

- Upon publication of research results

After publication of the relevant article

Which data usage licenses are you going to provide?

If none, please explain why.

- Other (specify below)

none, as all data will be factual

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

none available at the moment

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

none

Responsibilities

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

- Vincent Van Deuren
- Silke Denis
- Future participants of Nanoblocks project

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

Vincent Van Deuren

Silke Denis

Future participants of Nanoblocks project

Who will manage data preservation and sharing?

prof. Peter Dedecker

Who will update and implement this DMP?

Vincent Van Deuren