Epigenetic regulation of HIV-1 transcription: Towards a block-and-lock functional cure

A Data Management Plan created using DMPonline.be

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Project abstract:

Infection with the human immunodeficiency virus type 1 (HIV-1) leads to the acquired immune deficiency syndrome (AIDS). HIV patients are currently treated with combination antiretroviral therapy, which reduces the viral load but cannot cure infection. Persistence of integrated viral DNA that has entered a transcriptionally silent mode in cellular reservoirs, is considered as the major barrier to cure HIV infection. Several cure strategies are in development. My host lab focuses on a block-and-lock cure strategy with the goal to create a cellular reservoir resistant to reactivation, and thus unable to rebound after treatment interruption. HIV transcription depends on lens epithelium- derived growth factor (LEDGF/p75) mediated integration into active genes and the proximity to enhancers. My host lab developed LEDGINs, small molecules that inhibit the interaction between the viral integrase and LEDGF/p75, reduce viral integration and retarget the provirus to regions resistant to reactivation. In my PhD project I will investigate the role of bromodomain containing protein 4 (BRD4), known to bind to enhancers, in residual HIV transcription after LEDGIN-mediated retargeting. Furthermore, I will test a new class of BRD4 inhibitors, ZL0580 analogues, for their latency inducing activity. Finally, I will examine the role of mixed lineage leukemia protein-1 (MLL1), which is tethered by LEDGF/p75 to the chromatin, and casein kinase II (CKII) in HIV basal transcription and reactivation.

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Epigenetic regulation of HIV-1 transcription: Towards a block-and-lock functional cure Application DMP

Questionnaire

Describe the datatypes (surveys, sequences, manuscripts, objects …) the research will collect and/or generate and /or (re)use. (use up to 700 characters)

Generate new data, I will not work with personal data

- Spreadsheets created from experimental data such as luciferase, BCA, etc. (.xlsx, .csv)
- Fluorescent and confocal microscopy images (.png, TIFF, off)
- nuclei acid sequencing (snapgene)
- Text notes (.docx, .csv, .txt, .ape, .scf, one note lab book)
- biochemical experimentation readouts (western blotting)
- Presentations of observational data (.ppt, .pdf)

Specify in which way the following provisions are in place in order to preserve the data during and at least 5 years after the end of the research? Motivate your answer. (use up to 700 characters)

1. Joris Van Asselberghs, senior technician in our lab, guarantees the safeguarding of all data on a common storage drive with automatic back-up.
2. All data is saved on a J drive with automatic back-up (capacity of 2 TB). Furthermore, for storage of my personal data, a L-drive from my host lab with a capacity of 2 TB (can beexpanded upon my request) can be used. In addition, printouts of my research can be saved in the laboratory's archive, under responsibility of Brigitte Verheyden. Furthermore, all samples will be preserved in the appropriate freezers of -20°C and -80°C whereas cell lines are stored in liquid nitrogen. After my research, data will be stored on the OneDrive made available by KU Leuven

What's the reason why you wish to deviate from the principle of preservation of data and of the minimum preservation term of 5 years? (max. 700 characters)

NA

Are there issues concerning research data indicated in the ethics questionnaire of this application form? Which specific security measures do those data require? (use up to 700 characters)

NA

Which other issues related to the data management are relevant to mention? (use up to 700 characters)

NA

Epigenetic regulation of HIV-1 transcription: Towards a block-and-lock functional cure DPIA

DPIA

Have you performed a DPIA for the personal data processing activities for this project?

- Not applicable

Epigenetic regulation of HIV-1 transcription: Towards a block-and-lock functional cure GDPR

GDPR

Have you registered personal data processing activities for this project?

- Not applicable

Epigenetic regulation of HIV-1 transcription: Towards a block-and-lock functional cure 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.

Dataset Name	Description	New or reused	Digital or physical	Type of data	Technical format	data volume
Spreadsheets created from experimental data	Spreadsheets created from experimental data for example luciferase, FACS, BCA, qPCR, etc.	Generate new data	Digital	Experimental	.xlsx, .csv, txt.	<1GB
Fluorescent and confocal microscopy images	Fluorescent and confocal microscopy images (for example for RNAscope)	Generate new data	Digital/Physical	Experimental	.png, .TIFF, jpeg	<1TB
nuclei acid sequencing	nuclei acid sequencing	Generate new data	Digital	Software/ Experimental	snapgene, .dna	<1GB
Text notes	Text notes from experimental data	Generate new data	Digital	Experimental	.docx, .csv, .txt, .ape, .scf, one note lab book	<1GB
biochemical experimentation readouts	western blotting	Generate new data	Digital	Experimental	.tiff .pdf	<1GB
presentations	presentations	Generate new data	Digital	Observational	.ppt, .pdf	<1GB
cell lines	different knockdown cell lines	Generate new data	phsyical	Experimental	.xlsx, .csv, txt.	+/- 5 cell lines (stored in liquid nitrogen)

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:

NA

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, human subject data

Human peripheral blood lymphocytes (PBL) or CD4+ cells from human subjects will be used. Ethical approval is received (reference number: S58969-IRB00002047)

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

In this project we aim to design and validate compounds targeting BRD4. Active lead compounds will be patented and possibly licensed out to industry. To this purpose we collaborate with IOF manager Dr. Frauke Christ and with LRD to enable efficient valorization of lead compounds

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).

In general, in-house collected data will be noted in the one drive notebook unless otherwise described in the note book. Data collected not in-house or digital data will be assigned to a specific folder in the FWO fellow's (Eline Pellaers) KU Leuven Onedrive. This will be easily to find since there is a standard known by everyone working in the Laboratory for Molecular Virology and Gene Therapy.

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.

- No

No Metadata standard will be used. However, data will be easy to find since a one drive notebook will be used in which all dates of experiments are mentioned with a description. in this way it should be easy to find all data, which are divided into different work packages and subfolders.

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

Where will the data be stored?

Data will be stored at the FWO fellow's (Eline Pellaers) PC and the J drive of the laboratory molecular virology and gene therapy with a capacity of 2 TB (can be expanded upon my request). Furthermore, for back up storage of my analysed data/ presentations, the large volume storage of the laboratory of molecular virology and gene therapy will be used.

How will the data be backed up?

The data on the fellow's lab PC is synchronized with the fellow's KU Leuven Onedrive.
Furthermore, for back up storage of my analysed data/ presentations, the large volume storage of the laboratory of molecular virology and gene therapy will be used.

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

For storage of my personal data, a OneDrive made available by KU Leuven with a capacity of 2 TB (can be expanded upon my request) can be used.
Data from the FWO fellows (Eline Pellaers) KU Leuven Onedrive will also be backed up every 3 months at the the large volume storage of the laboratory of molecular virology and gene therapy, for which a capacity of 2 TB is available.

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

According to the FWO fellow's (Eline Pellaers) lab PC: an antiviral system is installed, no connection will be made with unknown networks and no illegal programs/software will be downloaded.
According to the Laboratory of Molecular Virology and Gene Therapy: access is only provided for strictly assigned persons and protected by a password.

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

The expected costs for data storage during the project will be around 1000 euro. Costs will be partially covered both by the research budget provided alongside with the FWO fellowship of Eline Pellaers and the Laboratory for Molecular Virology and Gene Therapy.

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 obtained data will be archived for at least 10 years according to KU Leuven RDM policy.

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

All obtained data will be archived at the L drive (Large Volume storage) of the laboratory of Molecular Virology and Gene Therapy at the KU Leuven.

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

The expected costs for data preservation during those 5 years will be around 500 euro. Costs will be covered by the Laboratory of Molecular Virology and Gene Therapy and by the research budget provided by the FWO fellowship of Eline Pellaers .

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, …)

Only data which were already published/mentioned in papers will be made available after the end of the project for public use. However, for a possible continuation of this research project, all unpublished data will be available in the Laboratory of Molecular Virology and Gene Therapy. In this way, data can still be accessed on demand.
In addition, data will be shared between close collaborators when necessary.

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

Everyone will be able to request access to published data by mail. Nevertheless, the PI (Zeger Debyser) and FWO fellow (Eline Pellaers) will, under consultation, evaluate if the request will be accepted. For example, on going collaborations/collaborators will, by great change, be accepted while competitive labs will be denied.

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.

All obtained data will be archived at the L drive (Large Volume storage) of the laboratory of Molecular Virology and Gene Therapy at the KU Leuven. Everyone will be able to request access to published data by mail.

When will the data be made available?

Upon publication of the research results or upon request by mail

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

NA

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?

The expected costs for data sharing will be largely based on the publication of papers. The price of publication is estimated at 3000 euro. This will be covered by the allocated project budget (FWO) and the Laboratory of Molecular Virology and Gene Therapy.

6. Responsibilities

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

Eline Pellaers

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

Eline Pellaers

Who will manage data preservation and sharing?

Zeger Debyser (PI) & Eline Pellaers

Who will update and implement this DMP?

Eline Pellaers