Data Management Plan- BiUM Model

content of the mySNF form

UNIL | Université de Lausanne
Faculté de biologie et de médecine

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FNSNF
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Data Management Plan – content of the mySNF form

	Question	Help text
1 Data collection and documentation		
	1.1 What data will you collect, observe, generate or re-use? Questions you might want to consider: - What type, format and volume of data will you collect, observe, generate or reuse? - Which existing data (yours or third-party) will you reuse?	Briefly describe the data you will collect, observe or generate. Also mention any existing data that will be (re)used. The descriptions should include the type, format and content of each dataset. Furthermore, provide an estimation of the volume of the generated data sets. (This relates to the *FAIR Data Principles* F2, I3, R1 & R1.2)
	1.2 How will the data be collected, observed or generated? Questions you might want to consider: - What standards, methodologies or quality assurance processes will you use? - How will you organize your files and handle versioning?	Explain how the data will be collected, observed or generated. Describe how you plan to control and document the consistency and quality of the collected data: calibration processes, repeated measurements, data recording standards, usage of controlled vocabularies, data entry validation, data peer review, etc. Discuss how the data management will be handled during the project, mentioning for example naming conventions, version control and folder structures. (This relates to the *FAIR Data Principle* R1)

1.3 What documentation and metadata will you provide with the data?

Questions you might want to consider:

- What information is required for users (computer or human) to read and interpret the data in the future?
- How will you generate this documentation?
- What community standards (if any) will be used to annotate the (meta)data?

Describe all types of documentation (README files, metadata, etc.) you will provide to help secondary users to understand and reuse your data.

Metadata should at least include basic details allowing other users (computer or human) to find the data. This includes at least a name and a persistent identifier for each file, the name of the person who collected or contributed to the data, the date of collection and the conditions to access the data. Furthermore, the documentation may include details on the methodology used, information about the performed processing and analytical steps, variable definitions, references to vocabularies used, as well as units of measurement. Wherever possible, the documentation should follow existing community standards and guidelines. Explain how you will prepare and share this information. (This relates to the *FAIR Data Principles* I1, I2, I3, R1, R1.2 & R1.3)

1 Data collection and documentation

1.1 What data will you collect, observe, generate or reuse?

Questions you might want to consider:

- What type, format and volume of data will you collect, observe, generate or reuse?
- Which existing data (yours or third-party) will you reuse?

Additional information 1.1

Dataset (data set): In a database, a set of data relating to a specific type of information is also considered as a data set.
Type: Observational data, experimental data, statistical data, survey results, etc.
Format: Choosing the appropriate file format is crucial for the accessibility and potential reusability of your data.
Open file formats can be used by anyone because the file specifications are publicly available. On the contrary, proprietary file formats work only with software provided by the vendor, and when the software is no longer supported, files in this format are usually unreadable.
Therefore, as much as possible, you should favor universal or open file formats for sharing or archiving data, such as those recommended below:
https://www.bium.ch/en/publication-open-access/data-management/#5

http://datadryad.org/pages/policies#formats

Response suggestion 1.1

This project will generate research **data on ..... from .....**. The specific types of data, equipment, software, format of data storage, and format of data sharing are listed for all research data used in this project in the tables 1 and 2 below.

Table1: Types of data, format and scale for new data

Types	***Equipment***	***Software***	***format of data storage***	***format of data archiving/sharing***	***Volume***
Microscopy images					
Raw data: microscopy cells images	Zeiss LSM 710 Quasar	ZEN lite software	.liff	.tiff uncompressed, JPEG2000	500 GB
secondary data: 3D Z-stack reconstructions and image processing's		Imaris 7.2.1 software; Fiji/ImageJ; Adobe Photoshop CS5	.ims, .tif series, .PSD	.tiff uncompressed, JPEG2000	1 TB
Analysed data: cells quantification		Imaris 7.2.1 software, Excel	.ims, .xlsx	.xlsx; .csv	3 GB
Raw data :time lapse video microscopy	Leica SP5	LAS AF Lite 4.0.11706	.czi files;.Avi,.Mov	MPEG-4; Motion JPEG 2000	500 GB
Analysed data: tracking function		Metamorph software 6.0	.xlsx	.xlsx; .csv	2 GB
Western Blots					
Row data: cells images					1 GB
Analysed data: quantification					500 MB
					TOTAL =

Table2: Types of data and format for reused data

Types	***format of data storage***
Genetics databases	
RNA sequencing	

If animals research data (mice, non-primate studies) see our additional DMP suggestions

1.2 How will the data be collected, observed or generated?

Questions you might want to consider:

- What standards, methodologies or quality assurance processes will you use?
- How will you organize your files and handle versioning?

Additional information 1.2

- ***Recommended conventions for File Naming from UBC library for http://researchdata.library.ubc.ca/plan/organize-your-data/***

Short, descriptive filenames and a simple hierarchy of files make navigation and location easier.
Set up conventions for your project, document them for all other team members and be consistent.

- ***Use a short unique identifier (e.g. Project Name or Grant #)***
  - *DO: CHHM*
  - *DON'T: Centre for Hip Health and Mobility*
  - *BECAUSE: Short filenames prevent the need for side scrolling and column adjustment.*
- ***Include a summary of content (e.g. Questionnaire or GrantProposal) as part of the file name***
  - *DO: FileNm_**Guidelines**_20140409_v01.docx*
  - *DON'T: FileNm_20140409.docx*
  - *BECAUSE: Files will be easier to find.*
- ***Use _ as delimiters. Avoid these special characters: & , * % # * ( ) ! @$ ^ ~ ' { } [ ] ? < > –***
  - *DO: FileNm_Guidelines_20140409_v01.docx*
  - *DON'T: FileNm Guidelines 2014 04 09 v01.docx*
  - *BECAUSE: Different computer systems handle special characters differently – filing order, etc.*
- ***Keep track of document versions either sequentially (e.g. v01, v02,) or with a unique date and time (e.g. 20140403_1800)***
  - *DO: FileNm_Guidelines_20140409_**v01**.docx*
  - *DON'T: FileNm_Guidelines_20140409_**Review**.docx AND FileNm_Guidelines_20140409_**Investigation**.docx*
  - *BECAUSE: Two years from now, you won't remember what you meant.*
- ***Denote dates in YYYYMMDD format***
  - *DO: Use 20140403*
  - *DON'T: Use 04032013*
  - *BECAUSE: Computers sort YYYYMMDD in chronological order.*
- ***Make folder hierarchies as simple as possible***

- *DO: F:/* ***Env/LIBR/****DataMgmt_FileFormats_20140409_v01.docx*
- *DON'T: F:/****Environment/Library/Woodward/Data/Education/Materials/Draft/2014/04/-****DataMgmt_FileFormats_20140409_v01.docx*
- *BECAUSE: Complex folder hierarchies are harder to navigate and offer more opportunities for filing errors. System back-ups may take longer.*

- ***Tutoriel Mantra en ligne: "Organizing data"***
- ***Tools for research data management and versioning***
  - Consider using *Electronic note book: http://www.labarchives.com/* and *LIMS: https://www.genohm.com/slims/*
  - Consider using version control software for data *Data Versioning: https://osf.io/ or manuscript Data driven, executable articles in Authorea*: *https://www.authorea.com/product*

Response suggestion 1.2

Methodologies for data collection / generation

Data generation and analyses from the research data summarized in the table "Types of data, format and scale".

- Procedure (and equipment) used to produce each dataset (linked to the grant application paragraphs?).
- Data files naming and labeling (short unique identifier and summary of content) & organization in folders and sub-folders.
- Versioning of a data subset distinguished via a subscript (v01, v02, etc) and date attached to the file name.
- Filename will appear as **DatasetName**(short unique identifier_summary of content)_**VersionNo_Date**(YYYYMMDD).

Data quality and standards

Routine procedures for conducting high quality research, published in peer reviewed journals:

- Instruments /machines calibration and control processes.
- Standard protocols in the field (refs?) used to collect data to ensure they are reliable and consistent.
- Appropriate experimental design, data recording and data validation (controls, randomization/blinding, sampling/replicate, experimental versus hypothesis driven protocol,…) to ensure internal validity.
- Trainings (techniques & data management) for the lab staff to ensure high quality data (PhD and continuing education via regular workshops in Open Science at the FBM doctoral school and at the FBM library).
- Peer review of the data: regular supervision and lab meetings to ensure that the procedures have been carried out correctly and that all data are properly recorded.

1.3 What documentation and metadata will you provide with the data?

- Questions you might want to consider:
- What information is required for users (computer or human) to read and interpret the data in the future?
- How will you generate this documentation?
- What community standards (if any) will be used to annotate the (meta)data?

Additional information 1.3

➢ ***« Documentation, metadata, citation" tutoriel en ligne, Mantra.***

Documentation:

- ***Research data need to be documented at various levels:***
  - ***Project level****: what the study set out to do, how it contributes new knowledge to the field, what the research questions/hypotheses were, what methodologies were used, what sampling frames were used, what instruments and measures were used, etc. A complete academic thesis normally contains this information in detail, but a published article may not. If a dataset is shared, a detailed technical report will need to be included for the user to understand how the data were collected and processed. You should also provide a sample bibliographic citation to indicate how you would like secondary users of your data to cite it in any publications, etc.*
  - ***File or database level****: how all the files (or tables in a database) that make up the dataset relate to each other; what format they are in; whether they supercede or are superceded by previous files. A readme.txt file is the classic way of accounting for all the files and folders in a project.*
  - ***Variable or item level****: the key to understanding research results is knowing exactly how an object of analysis came about. Not just, for example, a variable name at the top of a spreadsheet file, but the full label explaining the meaning of that variable in terms of how it was operationalised.*
- ***Some examples of data documentation are:***
  - *laboratory notebooks & experimental protocols*
  - *questionnaires, codebooks, data dictionaries*
  - *software syntax and output files*
  - *information about equipment settings & instrument calibration*
  - *database schema*
  - *methodology reports*
  - *provenance information about sources of derived or digitised data*

➢ *https://www.bium.ch/en/publication-open-access/data-management/#4*
➢ *https://github.com/mpaluch/datacite-metadata-generator*

Metadata:
Metadata should be as complete as possible, using the standards and conventions of a discipline, and should be machine readable. Metadata should always accompany a dataset, no matter where it is stored. Many academic disciplines have formalized specific metadata standards. You can consult them on:

- *Digital Curation Center.*
- *https://fairsharing.org/standards/*
- *Data Documentation Initiative (DDI) is an international standard for describing the data produced by surveys and other observational methods in the social, behavioral, economic, and health sciences.*

Response suggestion 1.3

Data documentation

To document our research, we will use laboratory notebooks, methodology reports, experimental protocols, information about equipment settings & instrument calibration, database schema, DMP **(refer to the list above)** which are essential components of data management.

Metadata

Use of discipline metadata standards (see above)

Readme XML file
All our generated datasets will be accompanied by a **DataCite standard metadata in a Readme XML file.** The **DataCite Metadata Schema** for Publication and Citation of Research Data will allow the data to be understood and reused by other members of the research group, and add contextual value to the dataset for future publishing and data sharing. The Readme XML file will be generated automatically using the **DataCite Metadata Generator** after filing the form requesting intrinsic metadata. The Readme XML file will ensure compatibility with international standards and will be human as well as machine readable.

- **Mandatory elements** will include the file name for the results (field Title)/creators name (field Creator)/affiliation (field creator affiliation)/type of data (field Resource Type).
- **Recommended elements** will include key words (field Subject)/date of data creation (field Date)/link to electronic notebook (field Related Identifier)/details on the methodology used, analytical and procedural information, definitions of variables, vocabularies, units of measurement (field Description).
- **Optional elements** will include information on the size / format / version / access /funding.

Files with internal metadata

Metadata while publishing datasets through nonprofit unstructured data repositories such as Zenodo or Dryad (see section 4):

- Similar standard XML metadata (DataCite Metadata Schema or Dublin Core) will be used to publish and share unstructured datasets. The XML metadata ensuring machine readability / interoperability is generated after filing the repositories submission form requesting intrinsic metadata. Metadata comprise in addition a persistent identifier, a date of publication and under what conditions (type of license) the dataset can be accessed
- Readme files in text and/or XML (see previous paragraph) formats with more detailed information will be upload with the dataset.

2 Ethics, legal and security issues	
2.1 How will ethical issues be addressed and handled? Questions you might want to consider: - What is the relevant protection standard for your data? Are you bound by a confidentiality agreement? - Do you have the necessary permission to obtain, process, preserve and share the data? Have the people whose data you are using been informed or did they give their consent? - What methods will you use to ensure the protection of personal or other sensitive data?	Ethical issues in research projects demand for an adaptation of research data management practices, e.g. how data is stored, who can access/reuse the data and how long the data is stored. Methods to manage ethical concerns may include: anonymization of data; gain approval by ethics committees; formal consent agreements. You should outline that all ethical issues in your project have been identified, including the corresponding measures in data management. (This relates to the *FAIR Data Principle* A1)
2.2 How will data access and security be managed? Questions you might want to consider: - What are the main concerns regarding data security, what are the levels of risk and what measures are in place to handle security risks? - How will you regulate data access rights/permissions to ensure the security of the data? - How will personal or other sensitive data be handled to ensure safe data storage and -transfer?	If you work with personal or other sensitive data you should outline the security measures in order to protect the data. Please list formal standards which will be adopted in your study. An example is ISO 27001-Information security management. Furthermore, describe the main processes or facilities for storage and processing of personal or other sensitive data. (This relates to the *FAIR Data Principle* A1)
2.3 How will you handle copyright and Intellectual Property Rights issues? Questions you might want to consider: - Who will be the owner of the data? - Which licenses will be applied to the data? - What restrictions apply to the reuse of third-party data?	Outline the owners of the copyright and Intellectual Property Right (IPR) of all data that will be collected and generated, including the licence(s). For consortia, an IPR ownership agreement might be necessary. You should comply with relevant funder, institutional, departmental or group policies on copyright or IPR. Furthermore, clarify what permissions are required should third-party data be reused. (This relates to the *FAIR Data Principles* I3 & R1.1)

2 Ethics, legal and security issues

2.1 How will ethical issues be addressed and handled?

Questions you might want to consider:

- What is the relevant protection standard for your data? Are you bound by a confidentiality agreement?
- Do you have the necessary permission to obtain, process, preserve and share the data? Have the people whose data you are using been informed or did they give their consent?
- What methods will you use to ensure the protection of personal or other sensitive data?

Additional information 2.1

Research on human subjects.

- ***Research data confidentiality***

- *FBM/CHUV researchers conducting research on human subjects should consult the Commission cantonale d'éthique de la recherche sur l'être humain before planning research data use and sharing.*
- *Swiss researchers must comply with the general protection privacy law regarding Federal Act on Data Protection.*
- *They also need to adhere to the Federal Act on Research involving Human Beings made to protect the dignity, privacy and health of human beings involved in research. Data concerning humans made publicly available must remain totally confidential and be anonymized. Researchers should include a provision for data sharing in the informed consent.*
- *The following article may help you in preparing your data for self-archiving: Hrynaszkiewicz I et al. (2010) Preparing raw clinical data for publication: guidance for journal editors, authors, and peer reviewers. Trials 2010 11:9. http://www.trialsjournal.com/content/11/1/9*

➢ ***Services at FBM UNIL- CHUV***

- ***Centre de Recherche Clinique de Lausanne (CRC).*** *FBM-UNIL/CHUV researchers conducting clinical study research should consult the CRC as earliest as possible when planning a prospective clinical study either interventional (trial) or observational. The CRC can provide them with services spanning from concept/design to publication, including solutions for electronic data capture, data management and statistical analysis. For more information, feel free to contact the service.*

- ***Unité de valorisation des données et des échantillons biologiques (VDE).*** *FBM-UNIL/CHUV researchers conducting research on human subjects and using samples from the Biobanque Institutionnelle de Lausanne should consult VDE before planning research data use especially to make sure that data are codified and correctly de-identified. For more information, feel free to contact the service*

- Vital-IT *is a Competency Centre in Bioinformatics and Computational Biology that provides infrastructure, support and technological R&D for life science and clinical research in Switzerland and internationally. is a plateform helping Swiss researchers for the management, codified /de-identified /anonymised, storage, analyses, and publication of genomic, proteomic and metabolomic big datasets. For more information, feel free to contact the service at the following address: http://www.vital-it.ch/about#contact*

➢ ***What do you need to consider when making openly available your data?***

Dryad's guidance: *"When making data publicly available, any human subjects data must be properly anonymized and prepared under applicable legal and ethical guidelines. When de-identifying your data, both direct and indirect identifiers need to be considered.* ***Dryad does not allow any direct identifiers, but a dataset may contain up to 3 indirect identifiers.*** *Direct identifiers include variables such as participant's name, initials, email, and postal code; indirect identifiers are data that if combined might lead to identification (see additional guidance on human subjects data).*

➢ *https://www.bium.ch/en/publication-open-access/data-management/#10*

Response suggestion 2.1

➢ **If animals research data (mice, non-primate studies)**

See our DMP suggestions for the permission and data management of animals' data through the project.
For research data sharing: This project will not produce sensitive human personal data and will not necessitate specific limitation for data sharing.

- **If human personal data**

Encoding/anonymization of data; gain approval by ethics committees; formal consent agreements:
Supplement the 3 following points based on your situation. If you plan to consult the CRC, VDE or VitalIF for correct encoding/anonymisation of your data you should mention it in your DMP and ask SNSF for cost coverage (refer to the info above).

For research data sharing: If some data cannot be shared publicly because they are bound by legal, ethical or confidentiality you should explain their specific constraints (refer to the info above). Data privacy for sensitive information **related to personal and private information will be handled carefully by our service. Indeed, our service will divulgate and provide open-access to human sensitive data only after the** explicit consent of the individuals **as well as** privacy protection through proper data anonymization. **We will ensure that shared data do not contain information which identifies, or which can be used in conjunction with other publicly available information to personally identify, any individual following DRYAD's recommendations.**

2.2 How will data access and security be managed?

Questions you might want to consider:

- What are the main concerns regarding data security, what are the levels of risk and what measures are in place to handle security risks?
- How will you regulate data access rights/permissions to ensure the security of the data?
- How will personal or other sensitive data be handled to ensure safe data storage and -transfer?

Response suggestion 2.2

Main concerns regarding data security, levels of risk and measures in place to handle security risks

- Loss of data Hard Disk Failure Rate / SSD Failure Rate (See 3.1)
- Global Malware Threats:

To overcome these issues we use of Antivirus & adapted Behavior:

- Installation and regular update of our antivirus application smb://nas.unil.ch/soft/Antivirus/ Symantec/@SEP
- Apply security patches (OS and applications)
- Activation of our Firewall
- no response to mail phishing
- no opening the attachment of unsolicited emails
- Inactive Flash player & Popups
- Backups !

Data access rights/permissions to ensure the security of the data Supplement the information

Handling of personal or other sensitive data to ensure safe data storage and -transfer

- **If animals research data (mice, non-primate)**

See our DMP suggestions for the permission and data management of animals data through the project.

- **If human personal data**

At FBM-UNIL

- **Data storage and regular back-up solutions at FBM-UNIL**
  See bellow in 3.1

- **Data protection**
  Mettre sur notre site?

- **The Ci service at UNIL** will provide appropriate protection of the hosted data on its technical infrastructure including the confidentiality and integrity of the data. The Ci will not modify or transmit the data except in the application of Swiss laws and in case of support and prevention of technical problems. In the area of information security, the **UNIL Institution mainly refers to the following international standards: ISO 27001** - International information security standard.
- **Sensitive data will be encrypted** by our lab members when stored on the NAS-UNIL (for example with "Cryptomator"), USB/external disk or on labtop (Mac : FileWault, Windows : Bitlocker). This guarantees that external individuals will not have access to our documents.
- **Data sharing via SwitchDRIVE and data transfer via SWITCHfilesender.**
  https://wwwfbm.unil.ch/wiki/si/start?id=en:public:documentation:services_switch

At CHUV
http://tribu.intranet.chuv/content-19.06.2017_17_40.pdf
http://tribu.intranet.chuv/content-17.02.2016_11_26.pdf

- **Data storage and regular back-up solutions at FBM-UNIL**
  See bellow in 3.1

- **Data protection** http://tribu.intranet.chuv/content-17.02.2016_11_26.pdf and see politique de sauvetage dans l'annexe B 4.6.
  The DSI-CHUV service will provide appropriate protection of the hosted data on its technical infrastructure including the

confidentiality and integrity of the data. The DSI-CHUV will not modify or transmit the data except in the application of Swiss laws and in case of support and prevention of technical problems. In the area of information security, the Institution mainly refers to the following international standards:

- **ISO 27001** – International information security standard "
- **ISO 27002** - Code of practice for information security controls
- **ISO/IEC 27002** - Information security management in health

- Sensitive Data will be stored without encoding on the **NAS-CHUV (share disk for CHUV clinical data) with very high protection.** For additional analysis, sensitive data will be **encoded by our lab members (or VDE/CRC) before to be stored on the NAS-CHUV (share disk for academic data)**. Sensitive data will be encrypted by our lab members when stored on USB/external disk or on labtop (Mac : FileWault, Windows : Bitlocker). This guarantees that external individuals will not have access to our documents.
- Transfer of encrypted data via Filecare.

2.3 How will you handle copyright and Intellectual Property Rights issues?

Questions you might want to consider:

- Who will be the owner of the data?
- Which licenses will be applied to the data?
- What restrictions apply to the reuse of third-party data?

Additional information 2.3

- *https://www.bium.ch/en/publication-open-access/data-management/#10*
- ***PACTT (Powering Academia-industry Collaborations and Technology Transfer).*** PACTT is the joint technology transfer office of the University of Lausanne (UNIL) and the University Hospital of Lausanne (CHUV). Contact us for commercialisation of research results, protection and management of intellectual property, negotiation and management of collaboration contracts with industry and other institutions, or if you need advice with the creation of a start-up company. For more information, feel free to contact the service at the following address: pactt.info@chuv.ch

Response suggestion 2.3

Intellectual property for datasets

Concerning the content, individual content items are not copyrightable, while in most jurisdictions such as the European Union and USA, data collection involving creativity can be copyrightable. The structural elements of a database involving originality is not explicitly covered by copyright in Switzerland (see code des obligations https://www.admin.ch/opc/fr/classified-compilation/19110009/201401010000/220.pdf).

By UNIL-CHUV contract any data created or modified in the course of our professional activity as a UNIL collaborator belongs to the UNIL (except for the copyright belonging to the creator). This means that for any use other than for scientific and academic purposes, UNIL approval is necessary (eg for patenting and commercialization) (see Directive du Conseil de Direction UNIL-CHUV du 02.12.2009 relative aux contrats et à la valorisation de la recherche).

Open licenses for data

Promoting sharing and unlimited use of the data that we have produced will be best achieved using **explicit licences**. For sharing our data, we will use a **creative common CC0 license as recommended by the UNIL University** or a **CC By license that is suitable for data sharing**. The CC0 is a 'public domain dedication', i.e. a waiver of **all** our rights including those of attribution. The CC By license will let others distribute, remix, tweak, and build upon our work, even commercially, as long as they credit us for the original creation.

Restrictions applying to the reuse of third-party data?

If some data cannot be shared in case of concern due to commercial and patenting issues **you should contact the PACTT and explain their specific constraints (see above).**

3 Data storage and preservation	
3.1 How will your data be stored and backed-up during the research? Questions you might want to consider: - What are your storage capacity and where will the data be stored? - What are the back-up procedures?	Please mention what the needs are in terms of data storage and where the data will be stored. Please consider that data storage on laptops or hard drives, for example, is risky. Storage through IT teams is safer. If external services are asked for, it is important that this does not conflict with the policy of each entity involved in the project, especially concerning the issue of sensitive data. Please specify your back-up procedure (frequency of updates, responsibilities, automatic/manual process, security measures, etc.)
3.2 What is your data preservation plan? Questions you might want to consider: - What procedures would be used to select data to be preserved? - What file formats will be used for preservation?	Please specify which data will be retained, shared and archived after the completion of the project and the corresponding data selection procedure (e.g. long-term value, potential value for reuse, obligations to destroy some data, etc.). Please outline a long-term preservation plan for the datasets beyond the lifetime of the project. In particular, comment on the choice of file formats and the use of community standards. (This relates to the *FAIR Data Principles* F2 & R1.3)

3 Data storage and preservation

3.1 How will your data be stored and backed-up during the research?

Questions you might want to consider:

What are your storage capacity and where will the data be stored?

What are the back-up procedures?

Response suggestion 3.1

DATA storage and regular back-up at FBM-UNIL

https://wwwfbm.unil.ch/wiki/si/fr:administratif:organisation:general:personnes

- IT service's responsible: Mathieu Noverraz
- **Appropriate data storage is under the responsibility of the Principal investigator Prof. X or the Lab manager X**

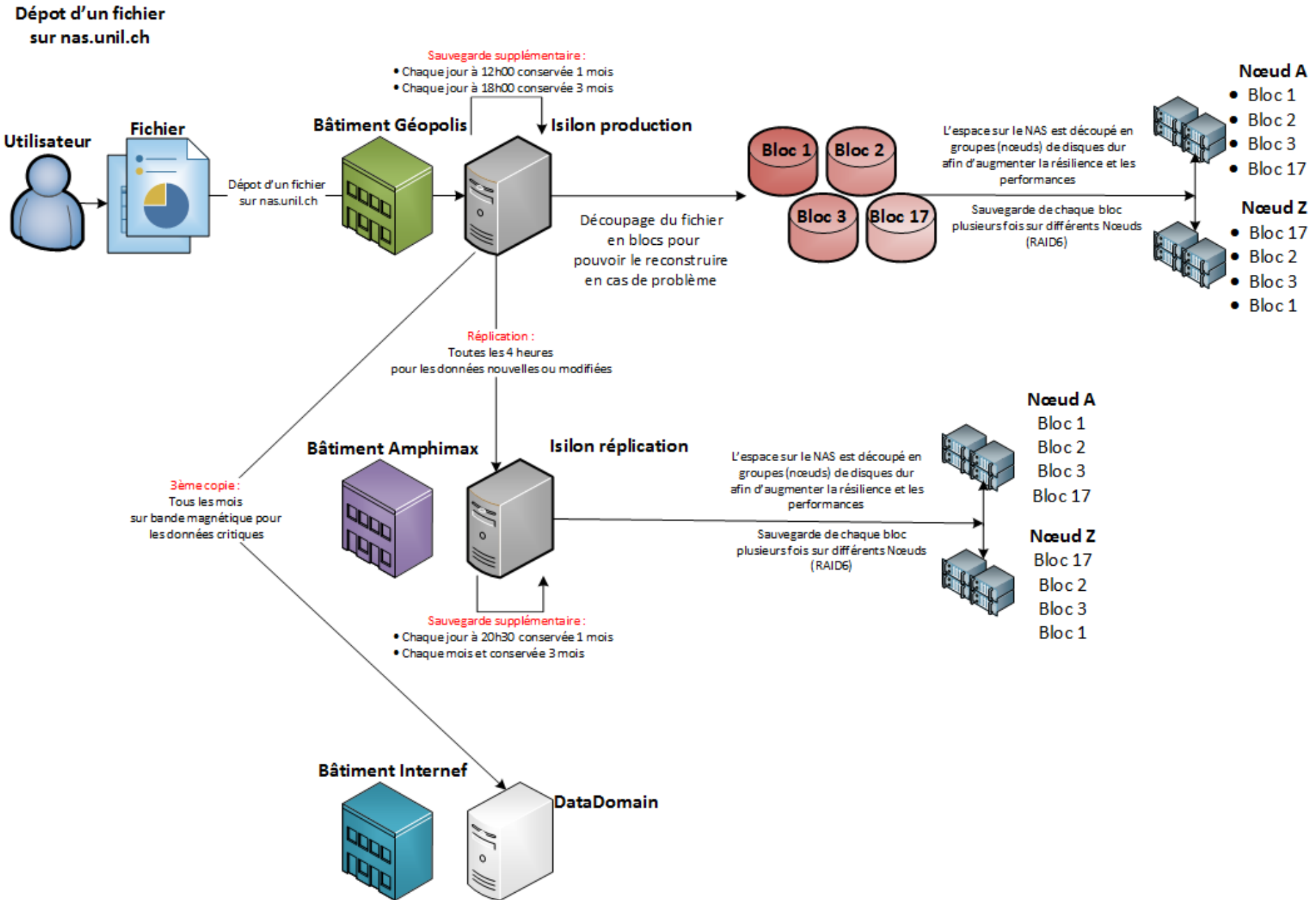
➢ **Desktop Backups via online Backups**

- CrashPlan PROe http://www.code42.com
- 100 GB per user
- Data are stored on the Ci local datacenter
- More info on
  - services-au-personnel/sauvegardes/postes- personnels.html
  - https://wp.unil.ch/cinn/2015/04/le-quota- de-crashplan-voit-double/

➢ ***Central Storage Tools at the IT service at FBM-UNIL***

Isilon Network Attached Storage NAS (NAS EMC Isilon):

- NSF, CIFS (Win/OSX/Linux);
- User-limited access rights management
- Access to files from anywhere in the world using a vpn;
- Upload: ~114 MB/s and Download: ~114 MB/s.
- Very high resistance to hardware and software failures;
- Security measures (protection against viruses, loss of data, etc.).
- **Data back-up and securisation**: **3 copies of the data**
  - ➢ Incremental backup every hour (snapshot);
  - ➢ Full daily backup of the data (2 per day) on the NAS;
  - ➢ Replication of the data;
  - ➢ Third copy for long-term archiving;
- **Costs (1 TB: 2 copies ~ 500.- CHF/year) (ask SNSF for cost coverage)**


Dépot d'un fichier
sur nas.unil.ch
Sauvegarde supplémentaire :
• Chaque jour à 12h00 conservée 1 mois
• Chaque jour à 18h00 conservée 3 mois
Utilisateur
Fichier
Dépot d'un fichier
sur nas.unil.ch
Bâtiment Géopolis
Isilon production
Découpage du fichier
en blocs pour
pouvoir le reconstruire
en cas de problème
Bloc 1
Bloc 2
Bloc 3
Bloc 17
L'espace sur le NAS est découpé en
groupes (nœuds) de disques dur
afin d'augmenter la résilience et les
performances
Sauvegarde de chaque bloc
plusieurs fois sur différents Nœuds
(RAID6)
Nœud A
• Bloc 1
• Bloc 2
• Bloc 3
• Bloc 17
Nœud Z
• Bloc 17
• Bloc 2
• Bloc 3
• Bloc 1
Réplication :
Toutes les 4 heures
pour les données nouvelles ou modifiées
Bâtiment Amphimax
Isilon réplication
3ème copie :
Tous les mois
sur bande magnétique pour
les données critiques
L'espace sur le NAS est découpé en
groupes (nœuds) de disques dur
afin d'augmenter la résilience et les
performances
Sauvegarde de chaque bloc
plusieurs fois sur différents Nœuds
(RAID6)
Nœud A
Bloc 1
Bloc 2
Bloc 3
Bloc 17
Nœud Z
Bloc 17
Bloc 2
Bloc 3
Bloc 1
Sauvegarde supplémentaire :
• Chaque jour à 20h30 conservée 1 mois
• Chaque mois et conservée 3 mois
Bâtiment Internef
DataDomain

DATA storage and regular back-up at CHUV

Central Storage Tools at the DSI service CHUV

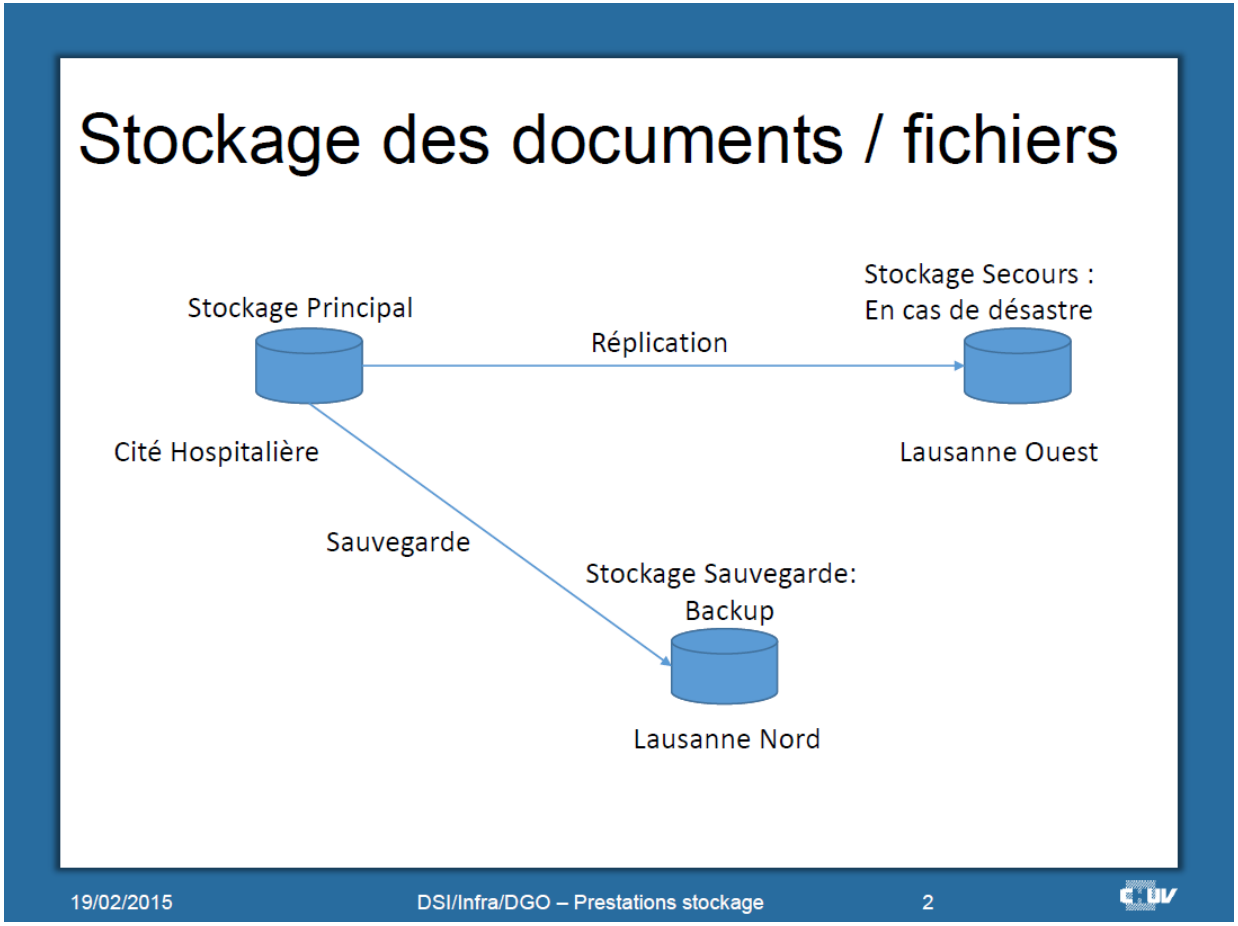
- IT service's responsible at DSI: Nicolas Rosat
- **Appropriate data storage is under the responsibility of the Principal investigator Prof. X or the Lab manager X**

➢ Space for personal data (Accessible via unit H)

- Also called RPS (Répertoire Personnel Sécurisé)
- User-limited access rights management
- Immediate and regular access
- Backup to the backup system by the DSI
- Time snapshots
- Available soon after disaster
- Storage of personal information

➢ **NetApp Network Attached Storage NAS:**

- NSF, FTP, Win.
- User-limited access rights management
- Access to files from anywhere in the world using a vpn.
- Very high resistance to hardware and software failures.
- Security measures (protection against viruses, loss of data, etc.).
- Data protection : the DSI-CHUV service will provide appropriate protection of the hosted data on its technical infrastructure including the confidentiality and integrity of the data. The DSI-CHUV will not modify or transmit the data except in the application of Swiss laws and in case of support and prevention of technical problems.
- Adequate protection of hosted data including confidentiality and integrity (see politique de sauvetage dans l'annexe B 4.6).
  - **Data back-up and securisation: 2 copies of the data**
  - Incremental backup (snapshot)
  - Full daily backup of the data on the share disk (1 x daily, usually overnight; retention 8 versions for daily backups, 2 versions for weekly backups)
  - Replication of the data on the backup disk (1 x daily, usually overnight; retention 30 versions for daily backups, 40 versions for weekly backups);
- **Costs (1 TB: 2 copies ~ 500.- CHF/year) (ask SNSF for cost coverage)**



OR

DATA archiving, Data base development and data curation at VitalIT
https://www.vital-it.ch/services/infrastructure/storage

Vital IT supports different kinds of storage and data management systems:

- Parallel and distributed **file system** with more than 2.3 PB (Peta Bytes) of fast disk space
- **Hierarchical Storage Management (HSM)** system with more than 3.6 PB (Peta Bytes) of space on magnetic tape (on-demand accessible from the cluster file system)
- Large-scale **relational database servers** (SQL-based)

Costs for data archiving (1 TB: 2 copies 430.- CHF/year) (ask SNSF for cost coverage)

Storage	**215** CHF per TB/year

Unit operational costs	**Price per TB/year (CHF)**
U.1: Direct costs Depreciation (for compute nodes with a life span ≤ 4 years) & hardware of non-enduring value (≤ 20K CHF)	51.00
U.2: Other direct costs Maintenance personnel and contracts	139.00
U.3: Indirect costs Administrative personnel & central services	25.00
U.T: Total costs	**215.00**

File system types

Archive	Each file is archived in at least two copies. **The storage amount is multiplied by 2.**
Scratch	A single copy of the file is stored in a RAID file system.

3.2 What is your data preservation plan?

Questions you might want to consider:

What procedures would be used to select data to be pre- served?

What file formats will be used for preservation?

Additional information 3.2

https://uniris.unil.ch/researchdata/

Response suggestion 3.2

Long term data archiving: collected data will be archived on the UNIL-NAS research storage (see Directive 4.2, art. 2.4).

Appropriate data archiving is under the responsibility of the Principal investigator Prof. X.

- **Published data:**
  Deposition and open data via Zenodo or Dryad repositories will ensure longevity of the data in the long-term. In addition, Primary and secondary research data supporting published articles will be retained on the UNIL-NAS or CHUV-NAS for **at least 10 years after publication.**
- **Unpublished data:**
  Unpublished high quality final data generated during this project will be saved for re-use during our future following projects. Some data will be made available for use by researchers for future collaborations if our lab doesn't use them. Bad quality data will be permanently discarded at the end of the project.

4. Data sharing and reuse		
	4.1 How and where will the data be shared? Questions you might want to consider - On which repository do you plan to share your data? - How will potential users find out about your data?	Consider how and on which repository the data will be made available. The methods applied to data sharing will depend on several factors such as the type, size, complexity and sensitivity of data. Please also consider how the reuse of your data will be valued and acknowledged by other researchers. (This relates to the *FAIR Data Principles* F1, F3, F4, A1, A1.1, A1.2 & A2)
	4.2 Are there any necessary limitations to protect sensitive data? Questions you might want to consider: - Under which conditions will the data be made available (timing of data release, reason for delay if applicable)?	Data have to be shared as soon as possible, but at the latest at the time of publication of the respective scientific output. Restrictions may be only due to legal, ethical, copyright, confidentiality or other clauses. Consider whether a non-disclosure agreement would give sufficient protection for confidential data. (This relates to the *FAIR Data Principles* A1 & R1.1)
	4.3 I will choose digital repositories that are conform to the FAIR Data Principles. [CHECK BOX]	The SNSF requires that repositories are conform to the FAIR Data Principles (Section 5 of the guidelines for researchers, SNSF's explanation of the FAIR Data Principles). If there are no repositories complying with these requirements in your research field, please deposit a copy of your data on a generic platform (see examples). If no data can be shared, this is a statement of principles.
	4.4 I will choose digital repositories maintained by a non-profit organisation. [RADIO BUTTON yes/no] → If the answer is no: "Explain why you cannot share your data on a non-commercial digital repository."	The SNSF supports the use of non-commercial repositories for data sharing. Costs related to data upload are only covered for non-commercial repositories.

4. Data sharing and reuse

4.1 How and where will the data be shared?

Questions you might want to consider

- On which repository do you plan to share your data?
- How will potential users find out about your data?

Additional information 4.1

http://www.snf.ch/en/theSNSF/research-policies/open_research_data/Pages/data-management-plan-dmp-guidelines-for-researchers.aspx
https://www.bium.ch/en/publication-open-access/data-management/#2
https://www.bium.ch/en/publication-open-access/data-management/#5
https://www.bium.ch/en/publication-open-access/data-management/#7

Response suggestion 4.1

Data sharing the latest at the time of publication via non-profit digital repositories

Repository on which the data will be made available.

Supplementary files and key **datasets accompanying the publication needed to make their publication reproducible will be made openly available on appropriate digital data repositories**, conform to the **Fair Data principles** and maintained by a **non-profit organisation**.

- Specific datasets will be shared via **domain-specific public repositories** (**see list recommended by PLoS**; **FAIRsharing.org**; **re3data.org**) **(precise which datasets and data repositories).**
- **Unstructured data** will be shared via the H2020 data repository **Zenodo-FBM/CHUV community** or **Dryad** **(choose already one after checking comparative table or remained open to both and make a final selection depending of journal requirements)**. The two following data repositories fulfill biomedical journals' and **SNSF's requirements** (allows publishing of FAIR data, non-commercial).
- **Ask SNSF for cost coverage**

How data will be made available.

Specific format for data sharing will be use to ensure files' preservation and re-use (see table DMP1.1, BiUM recommended

formats and Dryad recommendations). In some case, « Original » file will be uploaded along with the converted file.
For field specific standards consult https://fairsharing.org/standards/?q=
Datasets will be given a **Digital Object Identifier (DOI)** and **associated metadata**. The DOI corresponding to the datasets in the repository will be included in the reference list of the article, allowing the datasets underlying a publication to be identified and accessed.

Visibility and valorization of datasets

DOIs will also be linked to appropriate records in the University's publication repository **Serval**, to enhance the datasets visibility. Metadata about datasets will be publicly searchable and discoverable and will indicate how and on what terms the datasets can be accessed. Information about datasets will be displayed on the lab webpage, on researcher profile pages on **unisciences**, and on researchers ORCID iDs, which will also increase the visibility of the datasets.

How the reuse of our data should be valued?

Data will be shared using CC0 or CC BY licenses and should be considered as citable products of research (see **Joint Declaration of Data Citation Principles**).

4.2 Are there any necessary limitations to protect sensitive data?

Questions you might want to consider:
- Under which conditions will the data be made available (timing of data release, reason for delay if applicable)?

Additional information 4.2

More information for Open Data licences
https://www.bium.ch/en/publication-open-access/data-management/#10
https://www.bium.ch/en/publication-open-access/data-management/#11

Response suggestion 4.2

No specific limitation to data sharing

It is not anticipated that this study will generate any patentable data or proprietary data which would have to be protected.

Prof. X will be responsible to decide when to publish and make the Research Data accompanying the article publicly available and whether to supply research data to a new user.
Use of the data

- Data will be shared between lab members without limitation.
- Datasets will be made openly available on appropriate digital data repositories (see 4.1) at the latest at the time of publication.
- Data may be made available before publication upon demand to potential new collaborators.

Restrictions or delays to sharing

This project **will not produce sensitive human personal data** and **will not necessitate specific limitation for data sharing**. Restrictions to data sharing will be put in place only to ensure novelty of publication or **in case of concern related to commercial and patenting issues.** In other cases, data will be shared as widely as possible using CC0 or CC BY licenses.

Limitation to data sharing for human personal data.

As mentioned in 2.1 and 2.2 human sensitive data will be shared carefully due to legal, ethical and confidentiality issues.
Prof. X will be responsible to decide when to publish and make the Research Data accompanying the article publicly available and whether to supply research data to a new user.

Use of the data

- Encoded Data access will be restricted to specific lab members.
- Datasets will be made openly available or will be given restrictive access after deposition on appropriate digital data repositories (see 4.1) at the latest at the time of publication.
- Encoded data may be made available before publication upon demand to potential new collaborators.

Restrictions or delays to sharing

This project **will produce sensitive human personal data** and **will necessitate specific precaution and limitation for data sharing**.

- Our service will divulgate and provide open-access to human sensitive data only after the explicit consent of the individuals as well as privacy protection through proper data anonymization. We will ensure that shared data do not contain information which identifies, or which can be used in conjunction with other publicly available information to personally identify, any individual following DRYAD's recommendations. Data will be shared using CC0 or CC BY licenses.
- Restrictions to data sharing will be put in place to ensure sensitive data protection when perfect data anonymisation cannot be assured.

4.3 I will choose digital repositories that are conform to the FAIR Data Principles. [CHECK BOX **YES**

4.4 I will choose digital repositories maintained by a non-profit organisation. [RADIO BUTTON yes/no] **YES** → If the answer is no: "Explain why you cannot share your data on a non-commercial digital repository."