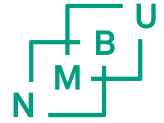# Research Data Management and Data Management Plans (DMP)

27th October 2021

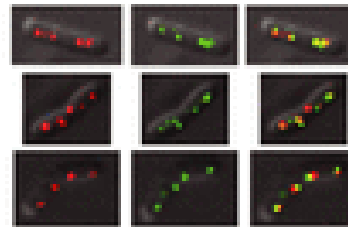Solveig Fossum-Raunehaug (Research Support Office)

What is Research Data?

Research data are all registrations/records/reports of numbers, texts, pictures and sounds generated or created during research projects.
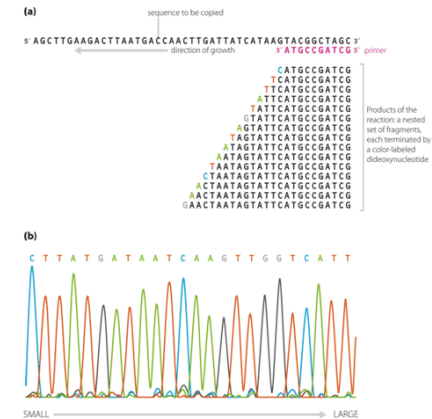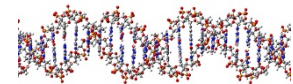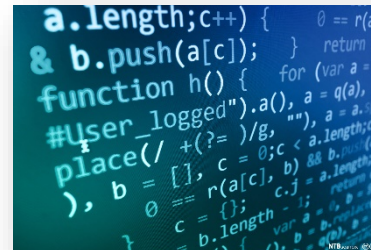
Questionaire

Pictures

Sequencing data

Data from the field

Algorithms

And more…

What is Research Data Management?

- Research Data Management is how researchers
    - Collect research data
    - Store research data in ongoing projects
    - Prosess and analyze research data
    - Archive/ deposit research data
    - Share research data (if possible)

Research Data is Classified

- Open (Green)
  - Data about animals, plants, bacteria, etc.
- Limited (Yellow)
  - Anonymised data, unpublished data, non-sensitive personal data
- In confidence (Red)
  - Certain types of sensitive personal data, personal files and information about a person's health
- Strictly in confidence (Black)
  - Large amounts of sensitive personal data, e.g. about people's health, research data of huge economic value

Policy and guidelines

- [National strategy on access to and sharing of research data](#) (Ministry of Education and Research Aug 2017)

- [Policy for Open Access to Research Data](#) (The Research Council of Norway Dec 2017)

- [Guidelines Research Data Management at NMBU](#) (Apr 2018)

Why Research Data Management is important?

«The Researcher Benefits»

- The digitale age

- Increased possibilities for sharing and reuse

- New collaborations

- Increased overview of your own and the research group's research results

Why?
«The PhD regulations and Research Ethics»

- From July 2020 - all new PhD candidates at NMBU should have a Data Management Plan (DMP)

- NMBU Guidelines for Research Ethics
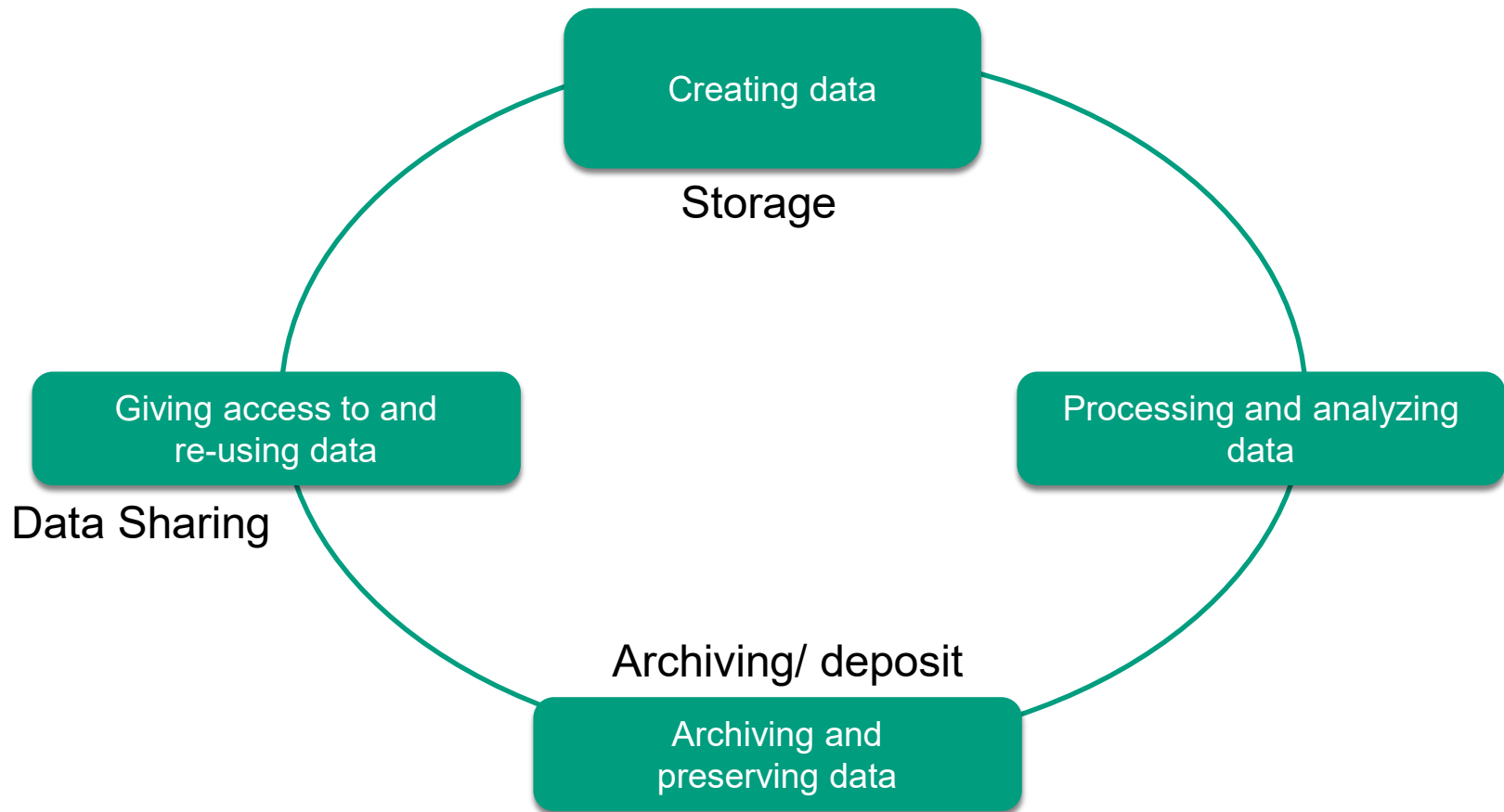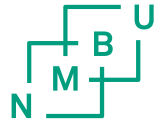
Why?
«Requirements from the funding agencies»

- The Research Council Norway and the EU

    – Description of research data management in the application

    – Data Management Plan (DMP) must be delivered upon contract agreement
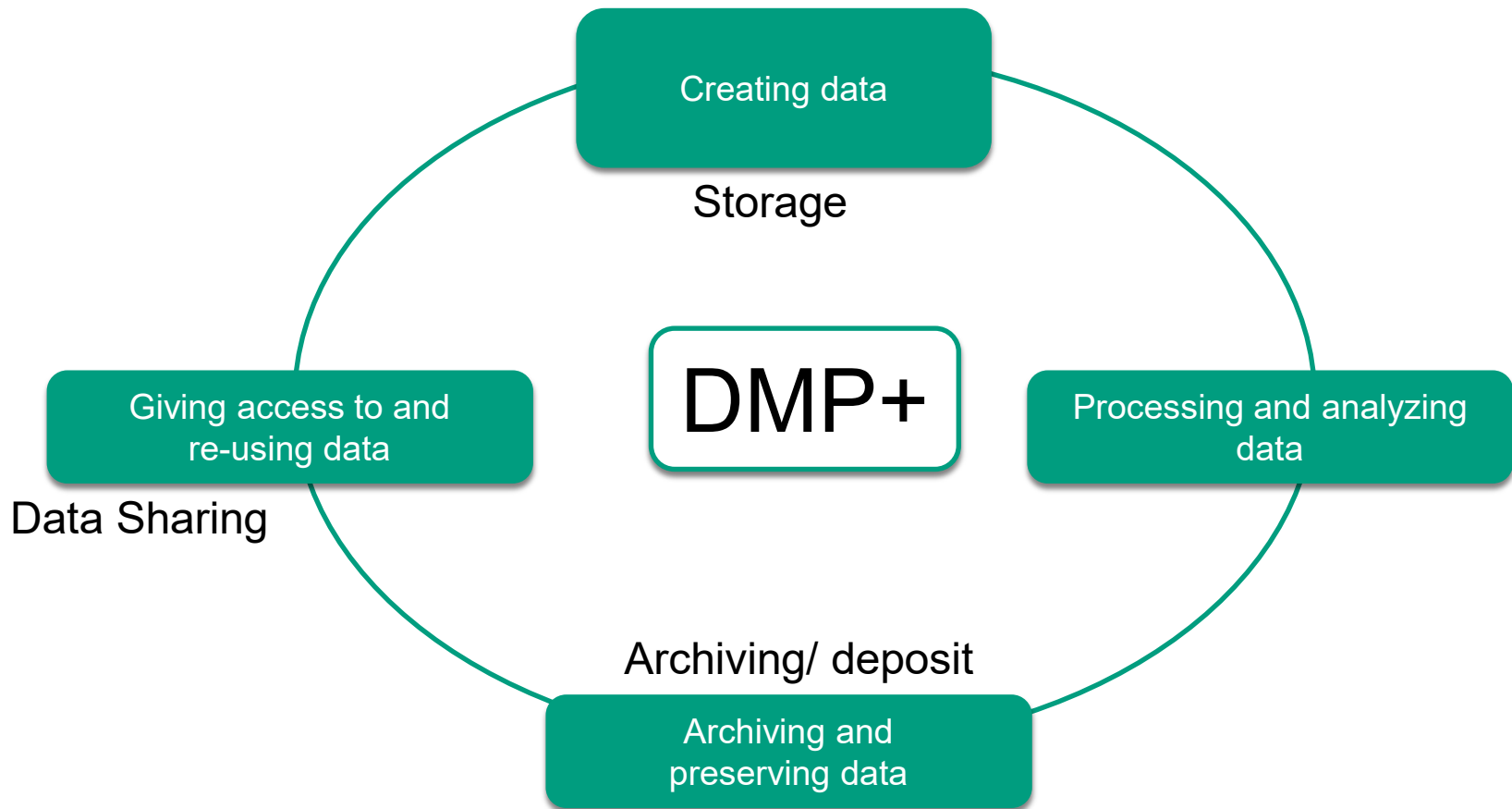
Data lifecycle

Creating data

Storage

Giving access to and re-using data

Data Sharing

Processing and analyzing data

Archiving/ deposit

Archiving and preserving data

Data lifecycle

FAIR principles

- FAIR is an acronym for the words Findable, Accessible, Interoperable og Reusable (gjenfinnbare, gjenbrukbare, skal kunne håndteres maskinelt og ha et konsistent vokabular)

- Research data must be of a quality enabling it to be found and possible to reuse.

- Both **data and metadata** must be designed for mechanical handling and consistent vocabulary must be used (interoperable).

- The Archives must fulfill the FAIR principles.

- The Data Management Plans must be according to the FAIR principles.

Data Management Plans (DMP)

- A Data Management Plan (DMP) should describe:

    - Type and scope of research data generated in a project

    - How the data will be stored

    - How the data will be archived

    - How data will be made available (if possible) after the project is completed

- DMP's must be according to the FAIR principles
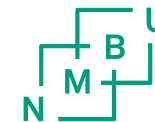
Data Management Plans (DMP) - tools

NMBU recommends students and employees to make use of:

- [The DMP made available at the Norwegian Centre for Research Data (NSD) (DMP+)](#)

- [ELIXIR Data Stewardship Wizard](#) might be used for research data management within life sciences.

Examples of national and international systems to generate DMPs:

- [National e-Infrastructure for Research Data (NIRD/Uninett Sigma 2)](#) (easy DMP)

- [FAIRDOM Data Management](#)

- [Digital Curation Senter - DMP online](#)

Webpages

Canvas course

- https://nmbu.instructure.com/courses/4825
- https://nmbu.instructure.com/courses/6249

Upcomming courses

KURS: Forskningsdata og datahåndteringsplan (3 timer)

I dette kurset får du kunnskap om hvordan du fyller ut en datahåndteringsplan, kunnskap om sikker lagring og arkivering forskningsdata, og hvordan du kan dele data med andre. Det er satt opp 2 kurs 27. oktober 2021, kurset er på 3 timer (ett på engelsk og ett på norsk). **Information in English**.

KURS: Forskningsdata med personopplysninger og datahåndteringsplan (5 timer)
Kurset har fokus på personvern i forskning og hvordan håndtere forskningsdata med personopplysninger. I tillegg får du kunnskap om hvordan du fyller ut en datahåndteringsplan, kunnskap om sikker lagring og arkivering forskningsdata, og hvordan du kan dele data med andre. Dato for kurs høst 2021: 28. oktober. **Information in English**.

Storage of Research Data
- in ongoing projects

Storage of Research Data without personal information – what do the guidelines say?

1. Research Data (raw data) must be stored at the NMBU server or in approved servers nationally or internationally.
2. You might take out a copy of the raw data and store it at your OneDrive server or personal computer for processing and analyzes.
3. However, research data should *NOT only be stored* on a personal computer (C-drive), external hard drives, dropbox etc.

Approved by the rector 10 April 2018

Guidelines Research Data Management at NMBU

- The Norwegian University of Life Sciences (NMBU) is compliant to the principle "Open as standard" – for research data generated in projects financed through public money.
- This will contribute to:
  - The development of a global research community where the research data is widely shared
  - Improved quality of research through a better way to build upon earlier work and to

Storage of Research Data without personal information - tools

- **Research Data** generated in ongoing projects should normally be stored at the LargeFile server (W:).

- **External cooperation (<u>should not be used as the primary place for storage</u>):** Sharing data using Office365 and OneDrive – NMBU services

LargeFile server W:

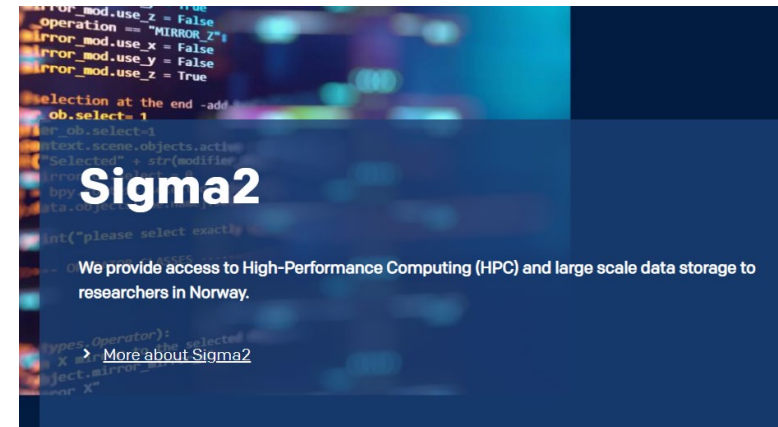# Storage and computing power (calculations) large datasets - tools

- Orion-cluster at NMBU or

- NIRD - UNINETT/ Sigma 2 service.

NMBU Orion HPC Cluster

Orion is a High-Performance Computing (HPC) cluster infrastructure available to employees, PhD and master students at NMBU. Orion can handle small-scale projects, but if you need more CPU-hours, please consider applying for national infrastructure resources: https://www.sigma2.no/ If you want to apply to access Orion, please fill out this file and submit it using the following form.

Contact: For any Orion compute cluster related enquiry: orion-support@nmbu.no

We provide access to High-Performance Computing (HPC) and large scale data storage to researchers in Norway.

> More about Sigma2

The Norwegian e-infrastructure for research and education.

VISIT OUR SERVICES >

Archiving (Deposit) and Sharing Research Data

Archiving (Deposit) – what do the guidelines say?

- Research data upon which scientific publications is based must be archived in domain specific, national or international data archives.

- The data archives must be compliant to international standards (FAIR).

- Recommendation - Do not deposit your data via journals!

Approved by the rector 10 April 2018

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Archiving (Deposit) - services

The NMBU Data archive:

- **NMBU Open Research Data** – NMBU service (University Library)

Examples of national data archives:

- **Norwegian Centre for Research Data (NSD)** (all type of data)
- **National e-Infrastructure for Research Data (NIRD)**. Is operated by UNINETT/ Sigma2 (large data sets)
- **The Norwegian Bioinformatics Platform (NELS) og ELIXIR NO** (biological and medical data)

Examples of international data archives:

- re3data.org is a global registry of research data repositories that fulfil the FAIR principles
- FAIRDOM helps you to be in control of collecting, managing, storing, and publishing your data, models, and operating procedures.
- CESSDA - Consortium of European Social Science Data Archives provides large scale, integrated and sustainable data services to the social sciences.
- DRYAD is a data sharing system.
- Zenodo is a EU based data sharing system, widely used in humaniora.

Sharing Research Data

- NMBU is compliant with the **FAIR-principles** (**F**indable, **A**ccessable, **I**nteroperable and **R**esuable) and the principle that

"Research data should be as open as possible, as closed as necessary"

Reasons for <u>not</u> sharing data:

- *Safety measures*

- *Personal data/ personal information*

- *Legal matters*

- *Commercial provisions*

- *Other conditions*

«It should be known that you have a data set, but others should not necessarily have full open access to the (raw) data»

Data Management Plan (DMP)

Summary NMBU guidelines

- The project leader have filled in a Data Management Plan (DMP) at the start of a project (continuous process)
- Data is stored at NMBU server or at national/ international platforms in ongoing projects.
- Data is tagged with metadata.
- Data is deposited in archives at the end of a project/ publication.
- Data is made open and available <u>when/ if</u> possible.

- Data is only stored at the local hard drive (C: disk).
- Data is only stored at Office365
- Data is only stored at an external hard drive.
- Data is stored in Dropbox.

Questions and comments?