Requirements
from funding bodies & institutions

Korbinian Bösl
Data management coordinator
ELIXIR Norway/Digital Life Norway
30th November 2020

19/12/2017

National strategy on access to and sharing of research data

Research data must be as open as possible, as closed as necessary

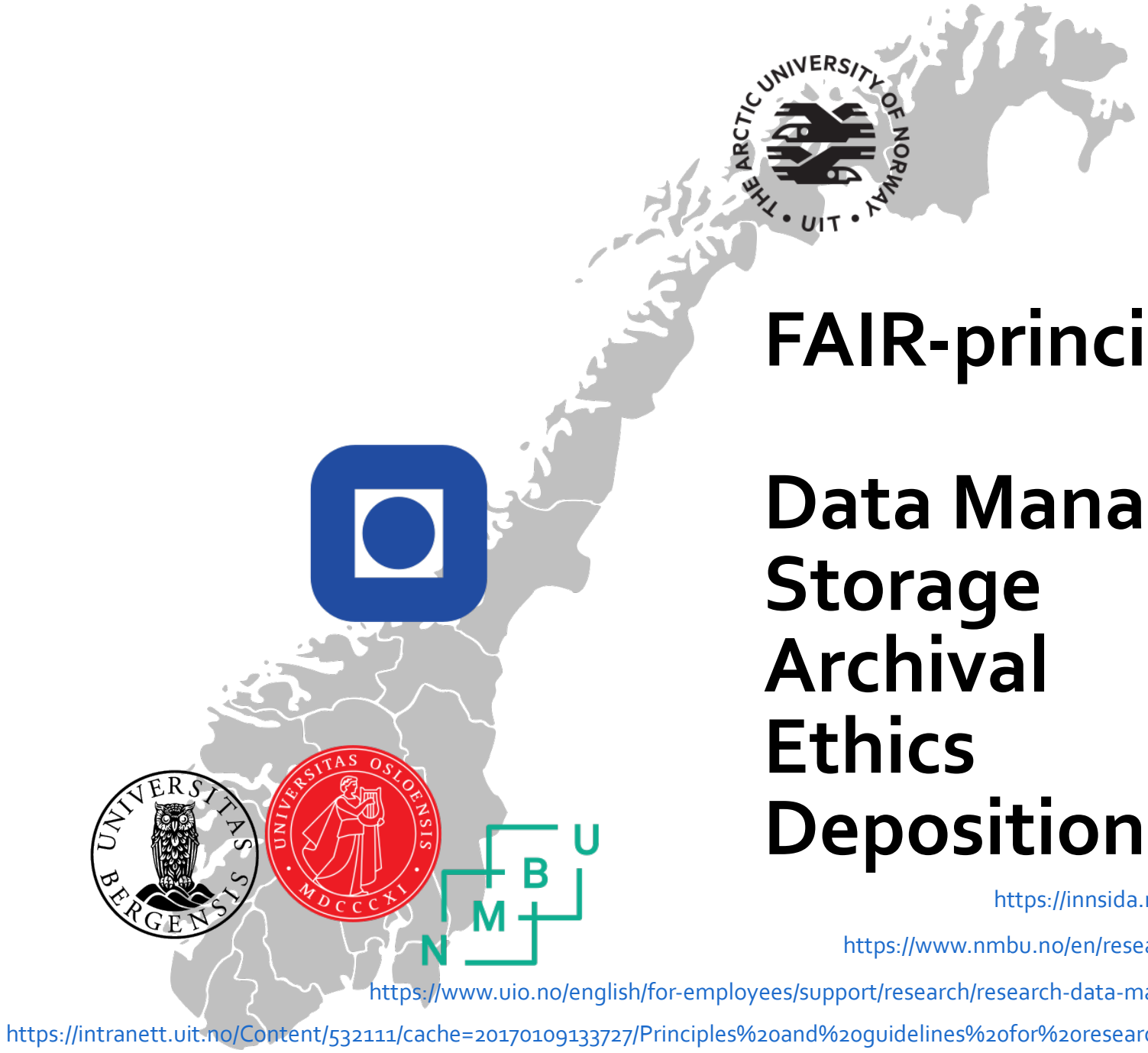
Research data should be managed and curated to take full advantage of their potential.

Decisions concerning archiving and management of research data must be taken within the research community

…
The Government expects:

the research institutions to develop procedures for (i) approving data management plans
…

https://www.regjeringen.no/en/dokumenter/national-strategy-on-access-to-and-sharing-of-research-data/id2582412/



FAIR-principles

Data Management Plan
Storage
Archival
Ethics
Deposition

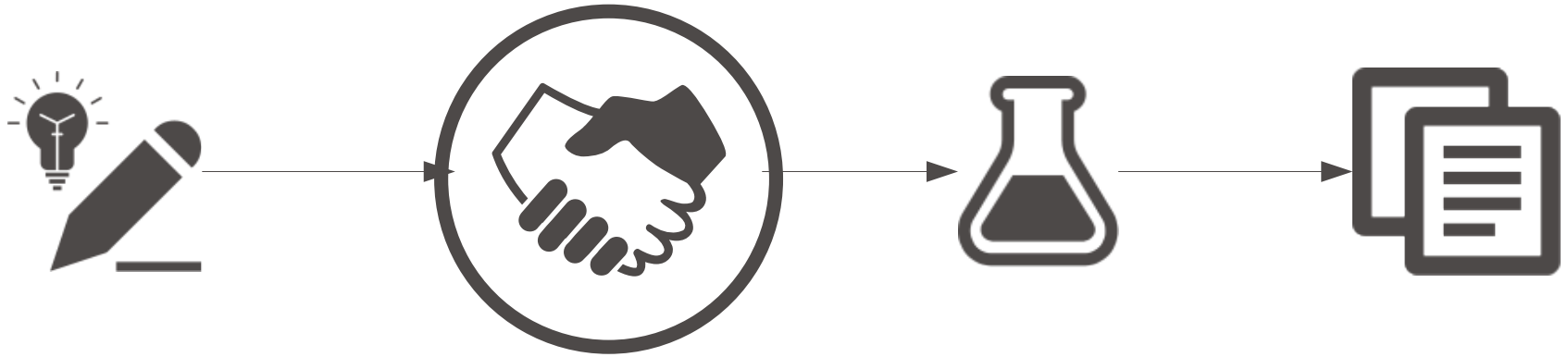
https://innsida.ntnu.no/wiki/-/wiki/English/NTNU+Open+Data

https://www.nmbu.no/en/research/for_researchers/researchdata/node/34680

https://www.uio.no/english/for-employees/support/research/research-data-management/policies-and-guidelines/index.html

https://intranett.uit.no/Content/532111/cache=20170109133727/Principles%20and%20guidelines%20for%20research%20management%20at%20UiT_010917.pdf

Forskningsrådet



DMP

SCIENCE EUROPE

Forskningsrådet

- Description & Re-use
- Documentation & Data quality
- Storage & Backups
- Legal & Ethic requirements
- Sharing & Preservation
- Responsibilities & Resources (FAIR principles)

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

https://www.scienceeurope.org/media/nsxdyvqn/se_guidance_document_rdmps.pdf

https://www.forskningsradet.no/en/forskningspolitisk-radgivning/open-science/open-access-to-research-data/

Description & Re-use

How will new data be collected or produced and/or how will existing data be re-used

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Description & Re-use

How will new data be collected or produced and/or how will existing data be re-used

What data (for example the kinds, formats, and volumes) will be collected or produced?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Documentation & Data quality

What metadata and documentation (for example the methodology of data collection and way of organising data) will accompany data?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Documentation & Data quality

What metadata and documentation (for example the methodology of data collection and way of organising data) will accompany data?

What data quality control measures will be used?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Storage and backup during the research process

How will data and metadata be stored and backed up during the research process?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Storage and backup during the research process

How will data and metadata be stored and backed up during the research process?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Storage and backup during the research process

How will data and metadata be stored and backed up during the research process?

How will data security and protection of sensitive data be taken care of during the research?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Legal and ethical requirements, codes of conduct

If personal data are processed, how will compliance with legislation on personal data and on data security be ensured?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Legal and ethical requirements, codes of conduct

If personal data are processed, how will compliance with legislation on personal data and on data security be ensured?

How will other legal issues, such as intellectual property rights and ownership, be managed? What legislation is applicable?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Legal and ethical requirements, codes of conduct

If personal data are processed, how will compliance with legislation on personal data and on data security be ensured?

How will other legal issues, such as intellectual property rights and ownership, be managed? What legislation is applicable?

How will possible ethical issues be taken into account, and codes of conduct followed?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Data sharing and long-term preservation

How and when will data be shared? Are there possible restrictions to data sharing or embargo reasons?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Data sharing and long-term preservation

How and when will data be shared? Are there possible restrictions to data sharing or embargo reasons?

How will data for preservation be selected, and where will data be preserved long-term (for example a data repository or archive)?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Data sharing and long-term preservation

How and when will data be shared? Are there possible restrictions to data sharing or embargo reasons?

How will data for preservation be selected, and where will data be preserved long-term (for example a data repository or archive)?

What methods or software tools will be needed to access and use the data?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Data sharing and long-term preservation

How and when will data be shared? Are there possible restrictions to data sharing or embargo reasons?

How will data for preservation be selected, and where will data be preserved long-term (for example a data repository or archive)?

What methods or software tools will be needed to access and use the data?

How will the application of a unique and persistent identifier (such as a Digital Object Identifier (DOI)) to each data set be ensured?

Open, (non-properitary) data formats!

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Data management responsibilities and resources

Who (for example role, position, and institution) will be responsible for data management (i.e. the data steward)?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

Data management responsibilities and resources

Who (for example role, position, and institution) will be responsible for data management (i.e. the data steward)?

What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?

SCIENCE EUROPE

https://www.scienceeurope.org/media/jezkhnoo/se_rdm_practical_guide_final.pdf

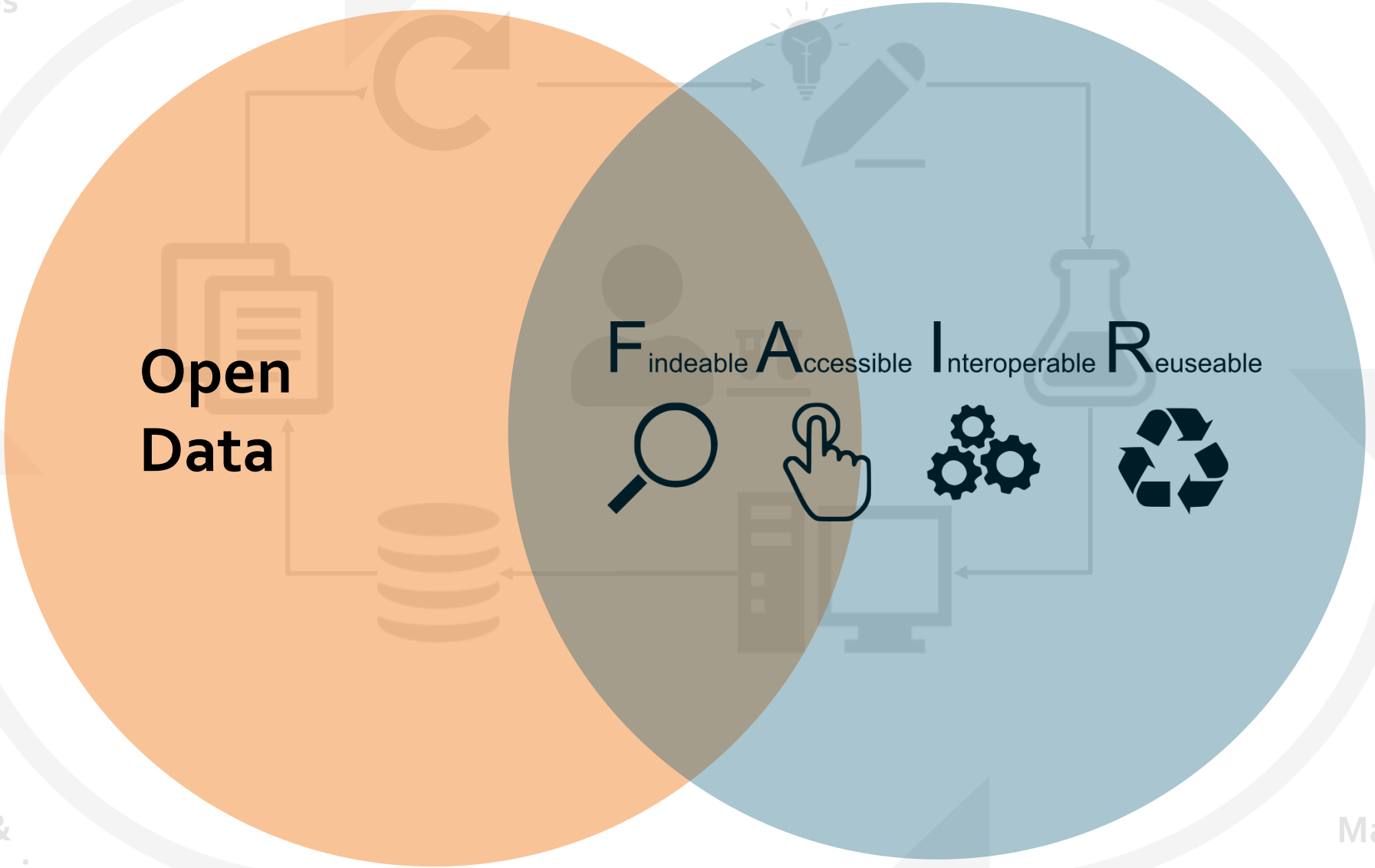
NeLS
Norwegian e-Infrastructure for Life Sciences

Findeable Accessible Interoperable Reuseable

sensitive data

Data catalogues & registries

Data creation & deposit



Archives & Data repositories

Managing active data

"As open as possible - as closed as necessary"

SCIENTIFIC DATA

Amended: Addendum

OPEN

SUBJECT CATEGORIES

» Research data

» Publication characteristics

Comment: The FAIR Guiding Principles for scientific data management and stewardship

Mark D. Wilkinson *et al.*[#]

Received: 10 December 2015

Accepted: 12 February 2016

Published: 15 March 2016

There is an urgent need to improve the infrastructure supporting the reuse of scholarly data. A diverse set of stakeholders—representing academia, industry, funding agencies, and scholarly publishers—have come together to design and jointly endorse a concise and measureable set of principles that we refer to as the FAIR Data Principles. The intent is that these may act as a guideline for those wishing to enhance the reusability of their data holdings. Distinct from peer initiatives that focus on the human scholar, the FAIR Principles put specific emphasis on enhancing the ability of machines to automatically find and use the data, in addition to supporting its reuse by individuals. This Comment is the first formal publication of the FAIR Principles, and includes the rationale behind them, and some exemplar implementations in the community.

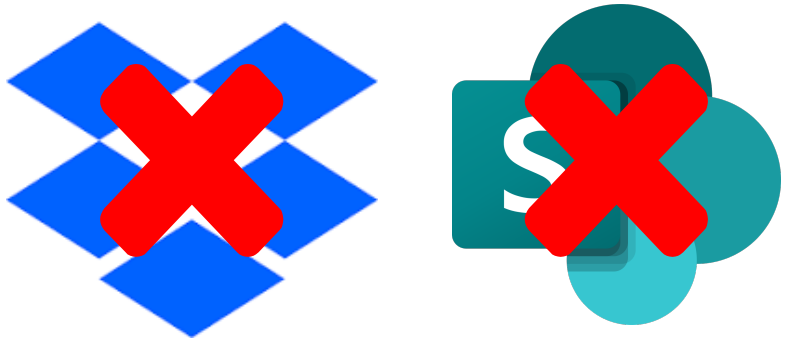
Identifiers.org

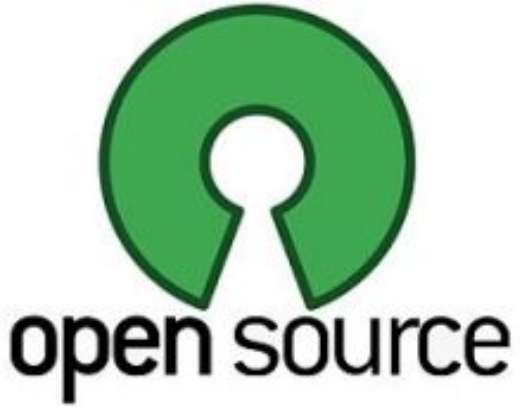
community metadata standards

+

elixir Deposition Databases

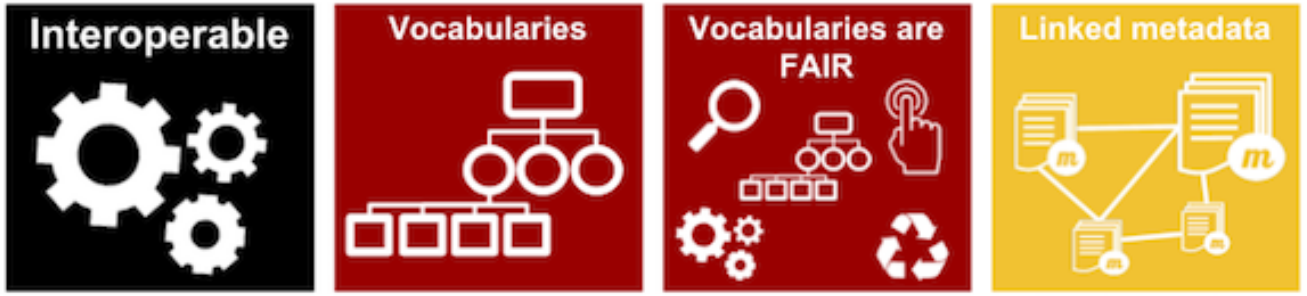
HTTP, FTP, SMTP, …

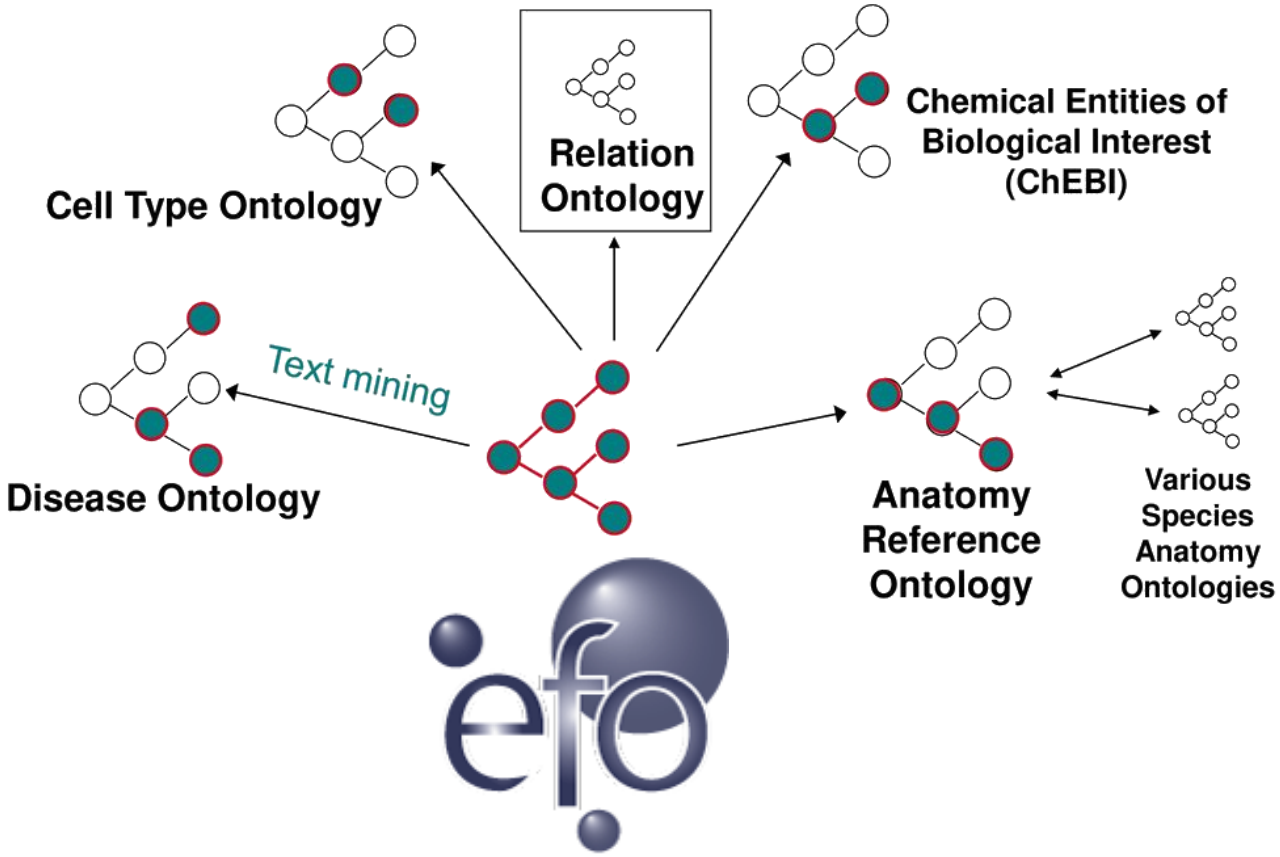


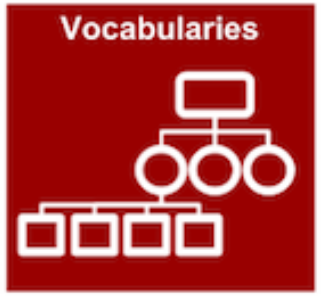


EUROPEAN GENOME-PHENOME ARCHIVE

EUROPEAN GENOME-PHENOME ARCHIVE








```
−<rdf:RDF xml:base="http://purl.uniprot.org/uniprot/">
  −<owl:Ontology rdf:about="http://purl.uniprot.org/uniprot/">
      <owl:imports rdf:resource="http://purl.uniprot.org/core/"/>
    </owl:Ontology>
  −<rdf:Description rdf:about="http://purl.uniprot.org/uniprot/C8V1L6">
      <rdf:type rdf:resource="http://purl.uniprot.org/core/Protein"/>
      <reviewed rdf:datatype="http://www.w3.org/2001/XMLSchema#boolean">false</reviewed>
      <created rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2009-11-03</created>
      <modified rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2020-02-26</modified>
      <version rdf:datatype="http://www.w3.org/2001/XMLSchema#int">56</version>
      <mnemonic>C8V1L6_EMENI</mnemonic>
      <citation rdf:resource="http://purl.uniprot.org/citations/16372000" rdf:ID="_C8V1L6-citation-16372000"/>
      <citation rdf:resource="http://purl.uniprot.org/citations/19146970" rdf:ID="_C8V1L6-citation-19146970"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/embl-cds/CBF71237.1"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/string/162425.CADANIAP00007466"/>
      <rdfs:seeAlso rdf:resource="http://rdf.ebi.ac.uk/resource/ensembl.transcript/CBF71237"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/hogenom/CLU_021795_2_0_1"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/inparanoid/C8V1L6"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/oma/RRMTQWD"/>
      <rdfs:seeAlso rdf:resource="http://purl.orthodb.org/odbgroup/896650at2759"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/gene3d/3.30.70.330"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/interpro/IPR012677"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/interpro/IPR035979"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/interpro/IPR000504"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/interpro/IPR006529"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/pfam/PF00076"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/smart/SM00360"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/supfam/SSF54928"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/tigrfams/TIGR01642"/>
      <rdfs:seeAlso rdf:resource="http://purl.uniprot.org/prosite/PS50102"/>
      <recommendedName rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIPA684070976E05B6F"/>
      <organism rdf:resource="http://purl.uniprot.org/taxonomy/227321" rdf:ID="_kb.C8V1L6_up.organism_6AB496E3E603B26C"/>
      <encodedBy rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#gene-MD5E291E4AD4C1ECECBE4D4D7FE32B9BC83"/>
      <annotation rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIPDCBF72D556B4C17A"/>
      <annotation rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIP600E1880AC5770AE"/>
      <annotation rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIP49AA1FD79CA811F6"/>
      <annotation rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIP7BCFB6F4503520CE" rdf:ID="_kb.C8V1L6_up.annotation_A9BB48146985900B"/>
      <annotation rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIP8811C283D149FFCC" rdf:ID="_kb.C8V1L6_up.annotation_6100E1840F3E6B30"/>
      <annotation rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIP1B2DE488903A2A87" rdf:ID="_kb.C8V1L6_up.annotation_4F93D190499FD709"/>
      <annotation rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIP301EE22FBBD02E62" rdf:ID="_kb.C8V1L6_up.annotation_B4852F7C86362ED8"/>
      <annotation rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#SIP4A6D84E3CC0142B3" rdf:ID="_kb.C8V1L6_up.annotation_FE1C22F76AA453DB"/>
      <existence rdf:resource="http://purl.uniprot.org/core/Inferred_from_Homology_Existence"/>
      <classifiedWith rdf:resource="http://purl.uniprot.org/keywords/508" rdf:ID="_kb.C8V1L6_up.classifiedWith_27D8C345566F5B54"/>
      <classifiedWith rdf:resource="http://purl.uniprot.org/keywords/539" rdf:ID="_kb.C8V1L6_up.classifiedWith_66DE634CA7CD240C"/>
      <classifiedWith rdf:resource="http://purl.uniprot.org/keywords/1185" rdf:ID="_kb.C8V1L6_up.classifiedWith_239F467843ABCFE3"/>
      <classifiedWith rdf:resource="http://purl.uniprot.org/keywords/694" rdf:ID="_kb.C8V1L6_up.classifiedWith_7EE88433D3D268B0"/>
      <classifiedWith rdf:resource="http://purl.obolibrary.org/obo/GO_0000243" rdf:ID="_kb.C8V1L6_up.classifiedWith_obo.GO_0000243"/>
      <classifiedWith rdf:resource="http://purl.obolibrary.org/obo/GO_0016607" rdf:ID="_kb.C8V1L6_up.classifiedWith_obo.GO_0016607"/>
      <classifiedWith rdf:resource="http://purl.obolibrary.org/obo/GO_0071004" rdf:ID="_kb.C8V1L6_up.classifiedWith_obo.GO_0071004"/>
      <classifiedWith rdf:resource="http://purl.obolibrary.org/obo/GO_0089701" rdf:ID="_kb.C8V1L6_up.classifiedWith_obo.GO_0089701"/>
      <classifiedWith rdf:resource="http://purl.obolibrary.org/obo/GO_0008187" rdf:ID="_kb.C8V1L6_up.classifiedWith_obo.GO_0008187"/>
      <classifiedWith rdf:resource="http://purl.obolibrary.org/obo/GO_0030628" rdf:ID="_kb.C8V1L6_up.classifiedWith_obo.GO_0030628"/>
      <classifiedWith rdf:resource="http://purl.obolibrary.org/obo/GO_0006397" rdf:ID="_kb.C8V1L6_up.classifiedWith_obo.GO_0006397"/>
      <classifiedWith rdf:resource="http://purl.obolibrary.org/obo/GO_0008380" rdf:ID="_kb.C8V1L6_up.classifiedWith_obo.GO_0008380"/>
      <sequence rdf:resource="http://purl.uniprot.org/isoforms/C8V1L6-1"/>
      <attribution rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#attribution-4D7F72A356C1855D0A9FA246AE0C711F"/>
      <attribution rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#attribution-E3AA1198D64AFFBCC64F0CE694EA8E54"/>
      <attribution rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#attribution-C5B03FC1845F8B79A72469B45442767E"/>
      <attribution rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#attribution-0B18EE4B5423117D3F80B78128A3200F"/>
      <attribution rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#attribution-7062DEDA0DB9D7DF2A2BE7AD38A57019"/>
      <attribution rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#attribution-367221EA5BFC27A5AFE9D2DBD051489F"/>
      <attribution rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#attribution-7D5ABB862784077AC8F3594D561C3762"/>
      <attribution rdf:resource="http://purl.uniprot.org/uniprot/C8V1L6#attribution-374C4A047C446855CBD16DE1E6AE8AD6"/>
      <annotation rdf:resource="http://purl.uniprot.org/proteomes/UP000000560#Chromosome%20I"/>
    </rdf:Description>
```

Describe the scope of your data: for what purpose was it generated/collected?

Mention any particularities or limitations about the data that other users should be aware of.

Specify the date of generation/collection of the data, the lab conditions, who prepared the data, the parameter settings, the name and version of the software used.

Is it raw or processed data?

Ensure that all variable names are explained or self-explanatory

Clearly specify and document the version of the archived and/or reused data.

Ideal:

creative commons

OPEN KNOWLEDGE FOUNDATION

But also more closed license possible - has to be defined !

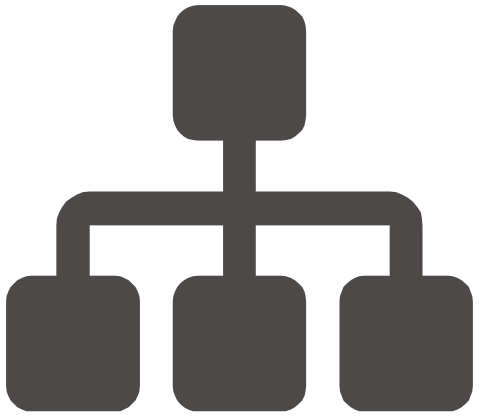
Where does the sample come from?

Where other analysed performed on the same sample?

On what is this based?

Which reference data was used?

….

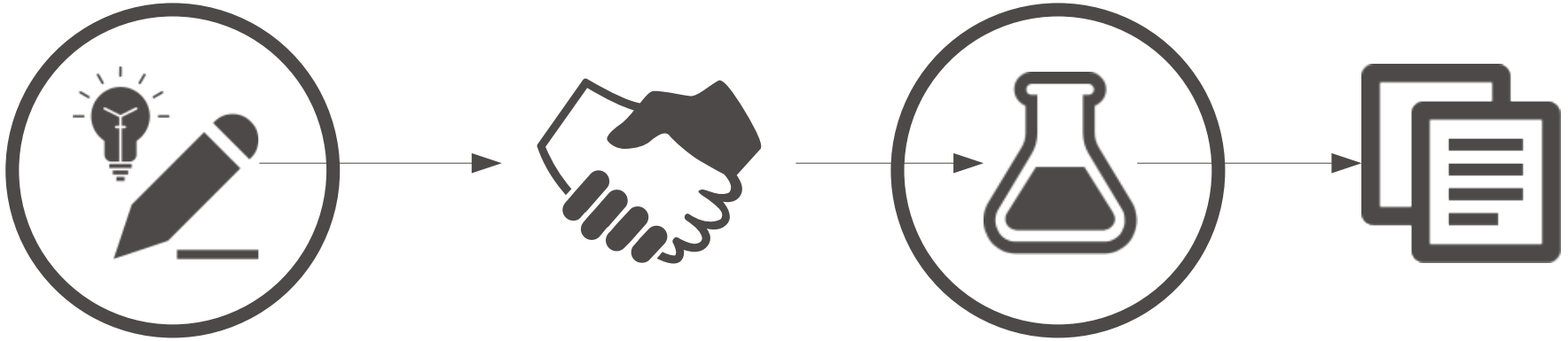


MAGE-TAB
EFO
MIAME
ISA-TAB
PDBx/mmCIF

Bioschemas

Horizon 2020 → Horizon Europe

Open Research Data Pilot (ORD pilot)
Default since 2017 → mandatory 2021



DMP
outline

DMP

- **After 6 month**
- **Update upon significant changes**

Horizon 2020 → Horizon Europe

Data summary

FAIR data implementation

Resources

Data security

Ethics

https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf

Data Steward Wizard

Adapted for users & laws
in Norway

compatible

SCIENCE EUROPE

DSW

elixir-no.ds-wizard.org

European Commission