

# ARCify your research project

February 11<sup>th</sup>, 2025

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# Goals

- First few steps into ARC ecosystem
- Move existing datasets into ARCs
- Share them via the DataHUB
- Annotate with metadata

# House-keeping

- Use the pad to raise questions and feedback
- Copy / paste links (hands-on)



# Training Materials

Slides are shared via [DataPLANT knowledge base](#)

# Resources – join the open source movement

## DataPLANT (nfdi4plants)

DataPLANT Website: <https://nfdi4plants.org/>

Knowledge Base: <https://nfdi4plants.org/nfdi4plants.knowledgebase/>

DataHUB: <https://git.nfdi4plants.org>

GitHub: <https://github.com/nfdi4plants>

HelpDesk: <https://helpdesk.nfdi4plants.org>

 You can help us by raising issues, bugs, ideas...

 NEW! ARC website: <https://arc-rdm.org>

# Continuous support

Data managers in Düsseldorf, Cologne, Jülich and close by (CEPLAS, MibiNet, TRR341) offer support.

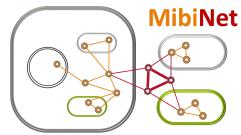
1. Slack Workspace for ad hoc support
2. Monthly user meeting (2nd Friday of the month)

→ [Details](#).



trr\_341

plant  
ecological  
genetics



## Introduce yourself

# Let's draw a typical lab workflow





# FAIR data stewardship

- Findable
- Accessible
- Interoperable
- Reusable

<https://doi.org/10.1038/sdata.2016.18>

[nature](#) > [scientific data](#) > [comment](#) > [article](#)

[Open Access](#) | [Published: 15 March 2016](#)

## The FAIR Guiding Principles for scientific data management and stewardship

[Mark D. Wilkinson](#), [Michel Dumontier](#), [IJsbrand Jan Aalbersberg](#), [Gabrielle Appleton](#), [Myles Axton](#), [Arie Baak](#), [Niklas Blomberg](#), [Jan-Willem Boiten](#), [Luiz Bonino da Silva Santos](#), [Philip E. Bourne](#), [Jildau Bouwman](#), [Anthony J. Brookes](#), [Tim Clark](#), [Mercè Crosas](#), [Ingrid Dillo](#), [Olivier Dumon](#), [Scott Edmunds](#), [Chris T. Evelo](#), [Richard Finkers](#), [Alejandra Gonzalez-Beltran](#), [Alasdair J.G. Gray](#), [Paul Groth](#), [Carole Goble](#), [Jeffrey S. Grethe](#), [Jaap Heringa](#), [Peter A.C. 't Hoen](#), [Rob Hooft](#), [Tobias Kuhn](#), [Ruben Kok](#), [Joost Kok](#), [Scott J. Lusher](#), [Maryann E. Martone](#), [Albert Mons](#), [Abel L. Packer](#), [Bengt Persson](#), [Philippe Rocca-Serra](#), [Marco Roos](#), [Rene van Schaik](#), [Susanna-Assunta Sansone](#), [Erik Schultes](#), [Thierry Sengstag](#), [Ted Slater](#), [George Strawn](#), [Morris A. Swertz](#), [Mark Thompson](#), [Johan van der Lei](#), [Erik van Mulligen](#), [Jan Velterop](#), [Andra Waagmeester](#), [Peter Wittenburg](#), [Katherine Wolstencroft](#), [Jun Zhao](#) & [Barend Mons](#) 

— Show fewer authors

[Scientific Data](#) 3, Article number: 160018 (2016) | [Cite this article](#)

# The FAIR principles

<p><b>Findable</b> <b>Accessible</b> <b>Interoperable</b> <b>Reusable</b></p>	<p><b>Easier collaboration &amp; sharing</b></p> <pre>graph TD; A(( )) --&gt; B(( )); A(( )) --&gt; C(( )); A(( )) --&gt; D(( )); B(( )) --&gt; E(( )); C(( )) --&gt; E(( )); D(( )) --&gt; E(( ));</pre>	<p><b>Increased findability and visibility</b></p>	<p><b>Reproducibility</b></p>
<p><b>Added-value to the research community</b></p> <p>nfdi      NCBI EMBL-EBI</p>	<p><b>Compliance with funding policies</b></p> <pre>graph LR; A[Checkmark Document] --- B[DFG]; A --- C[EU Flag]</pre>	<p><b>Receive due credit</b></p> <p>FAIR</p> <p>Reuse</p> <p>Citations</p>	<p><b>Saves time &amp; workload</b></p> <p>FAIR</p> <p>Time wasted</p>

# Is your data FAIR?

Findable | Accessible | Interoperable | Reusable

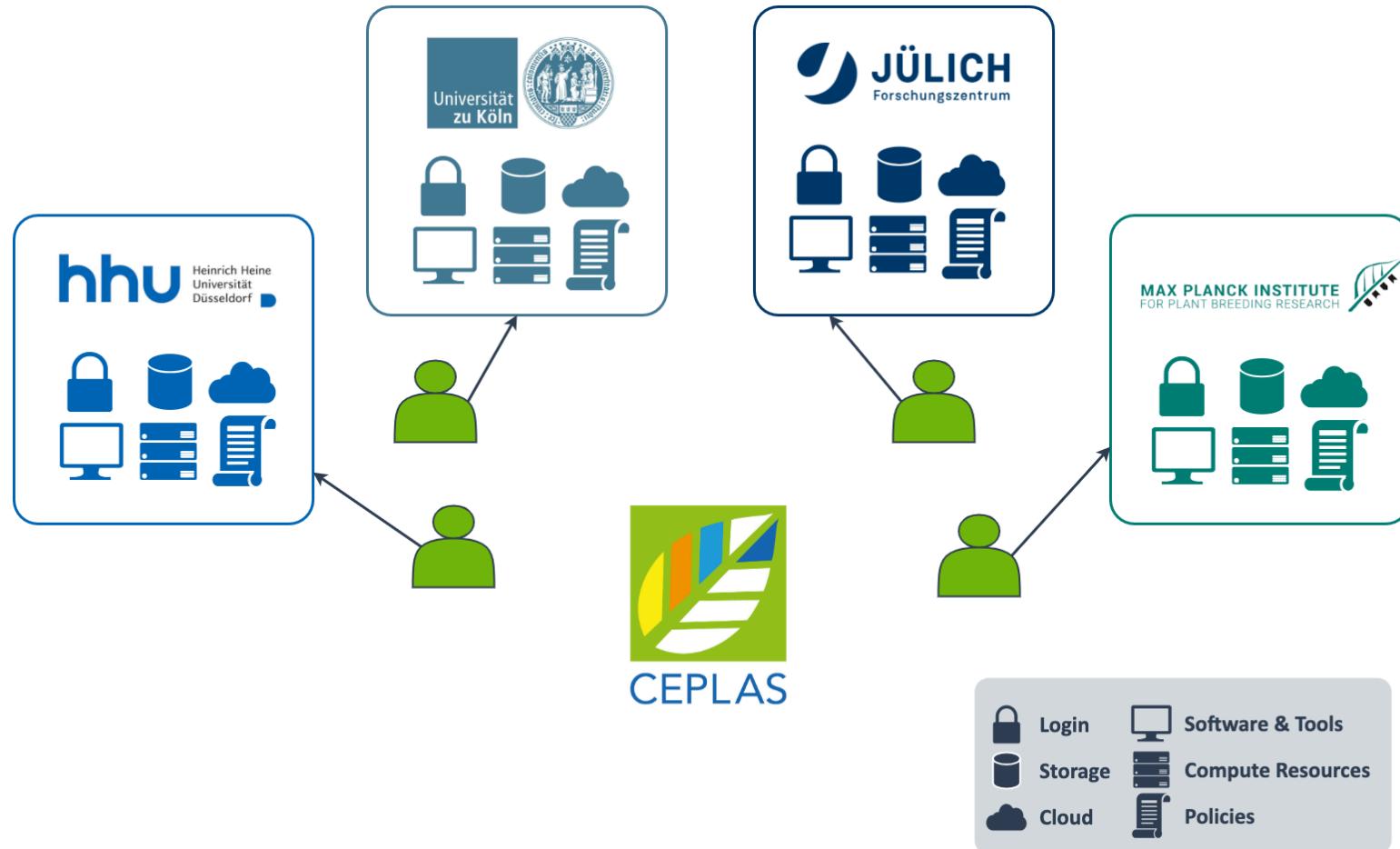
- Where do you store your data?
- How do you annotate your data?
- How do you share your data?
- What tools do you use to analyse your data?
- How do you reuse other people's data?



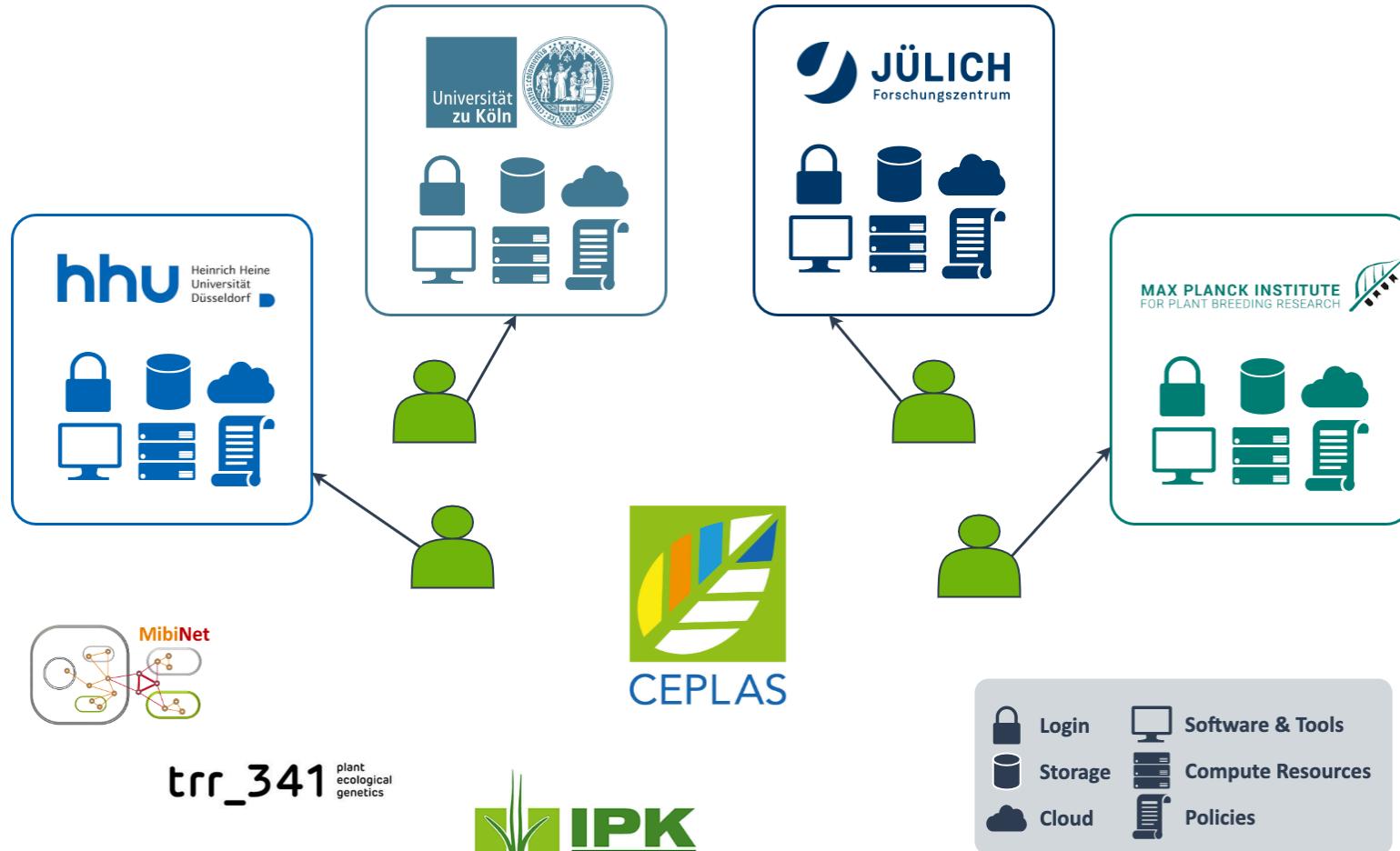
# CEPLAS – One cluster, four locations



# Data silos impede collaboration

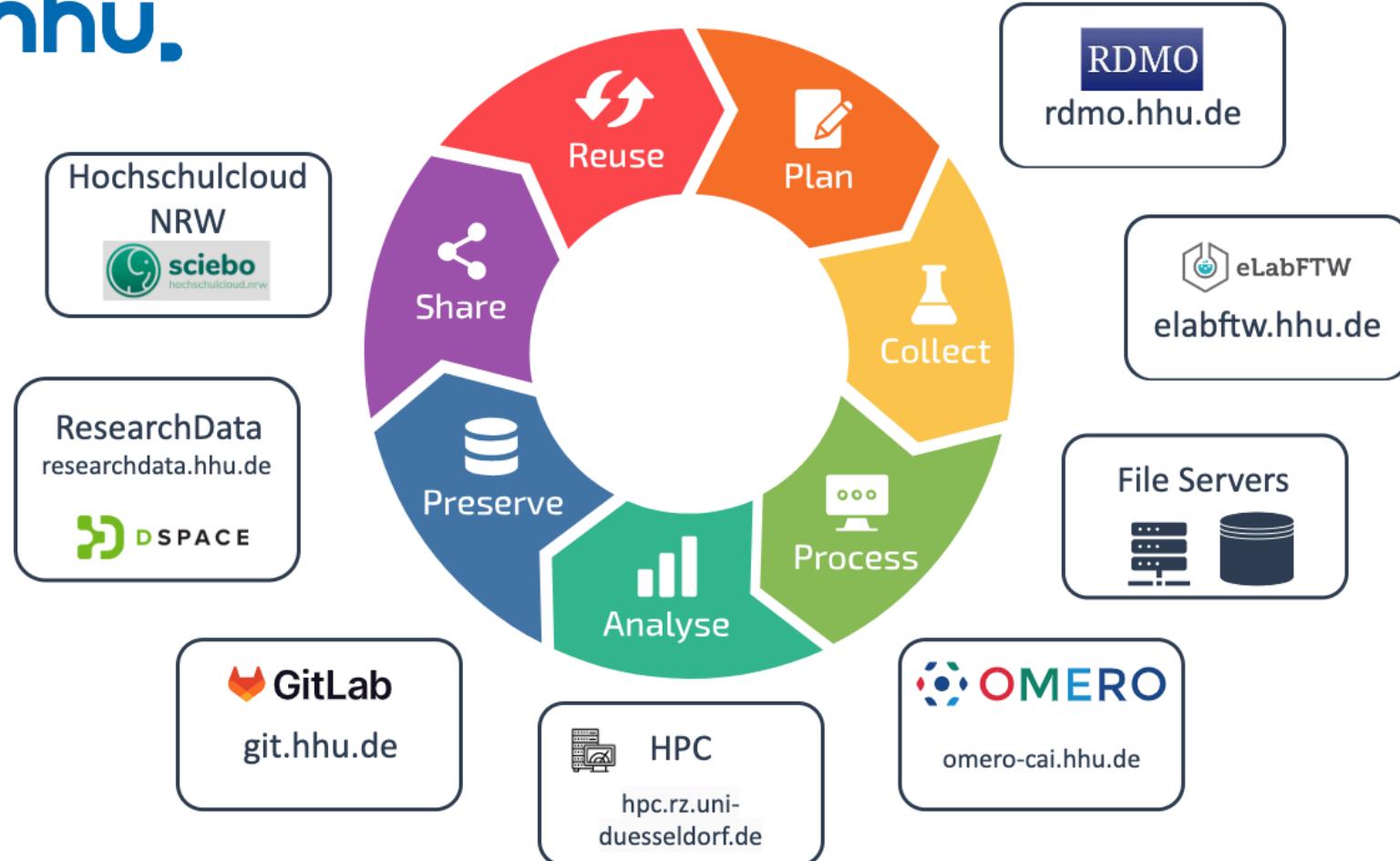


# Data silos impede collaboration

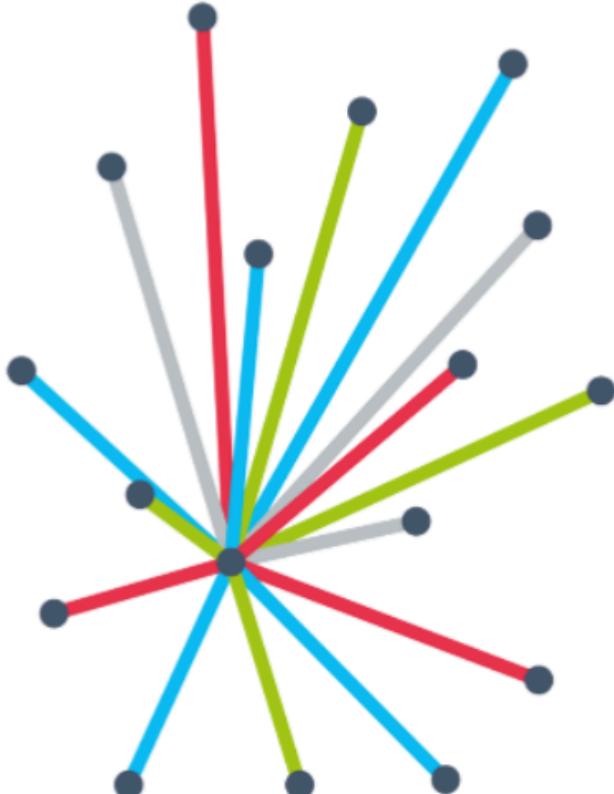


# Missing interfaces impede collaboration

hhu.



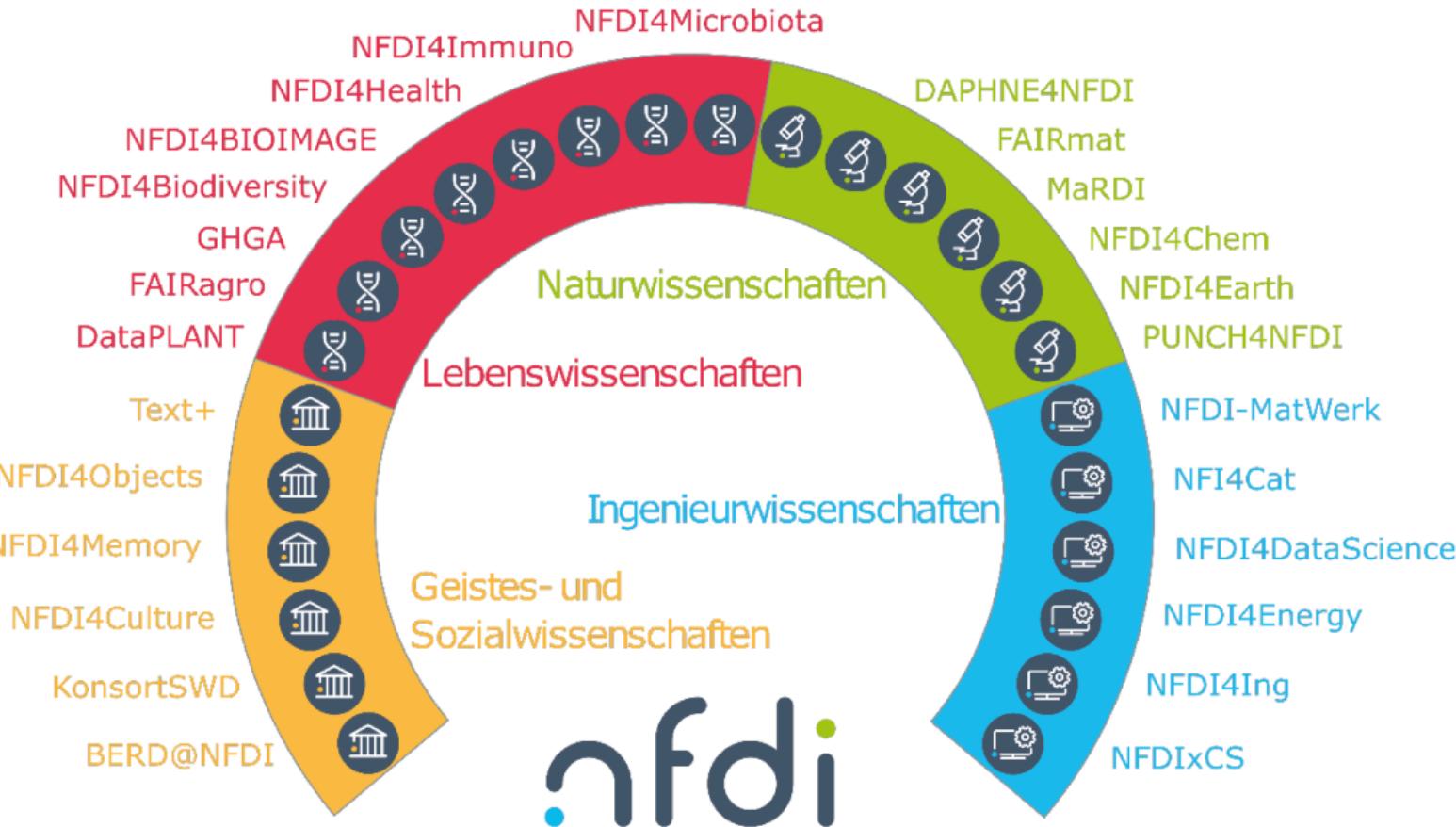
# NFDI – Nationale Forschungsdaten Infrastruktur



The aim of the national research data infrastructure (NFDI) is to systematically manage scientific and research data, provide long-term data storage, backup and accessibility, and network the data both nationally and internationally.

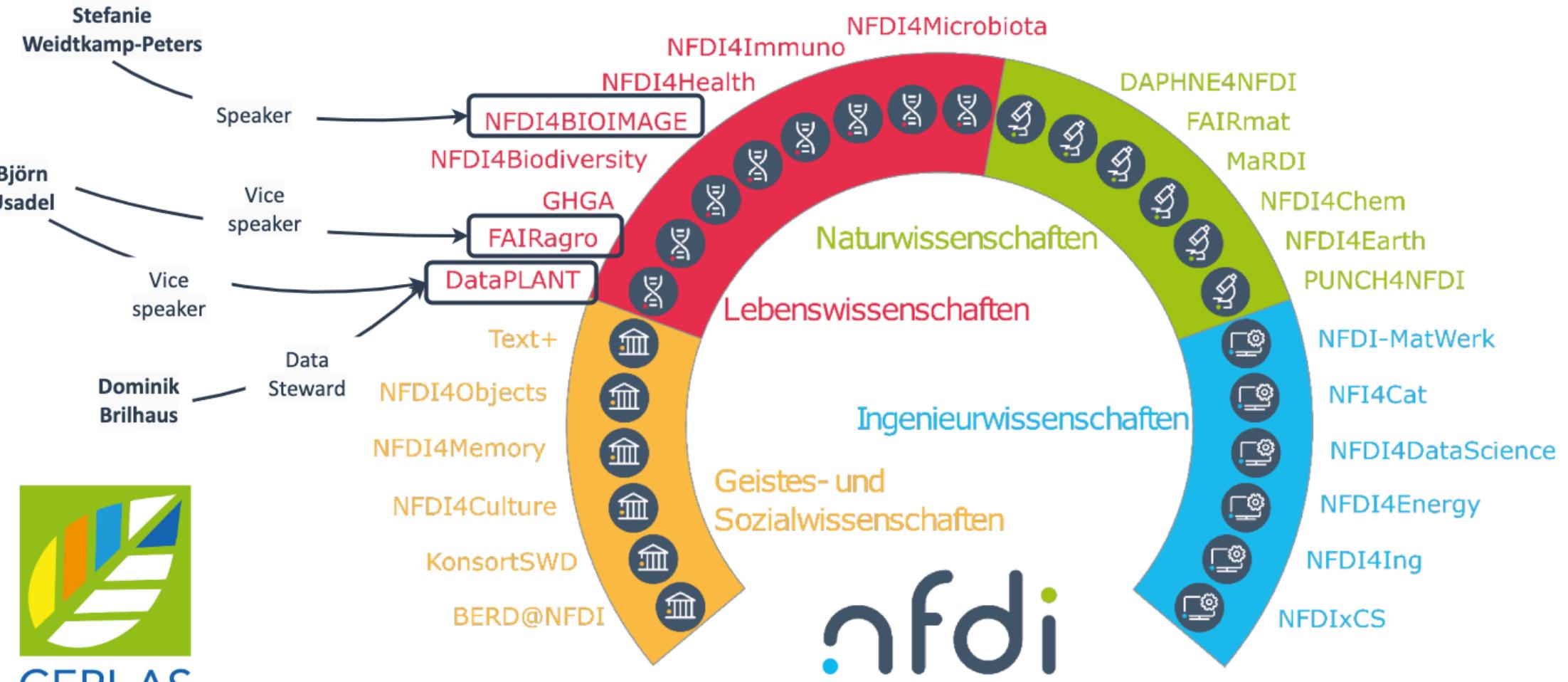
[nfdi.de](http://nfdi.de)

# NFDI – A community-targeted approach for RDM

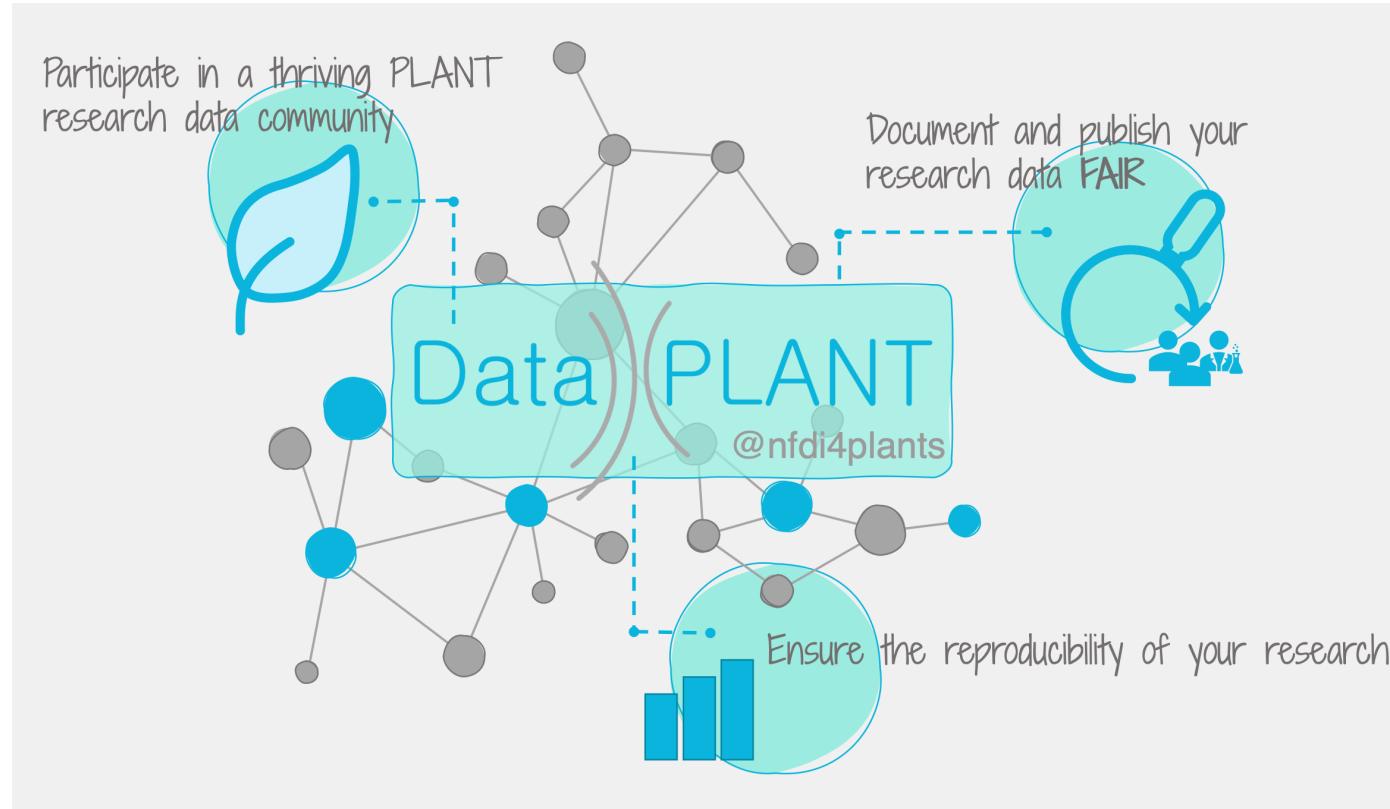


nfdi.de

# CEPLAS connection to the NFDI



# DataPLANT – NFDI4plants



- <https://nfdi4plants.org>
- <https://arc-rdm.org>

# Data Stewardship between DataPLANT and the community

*Community*

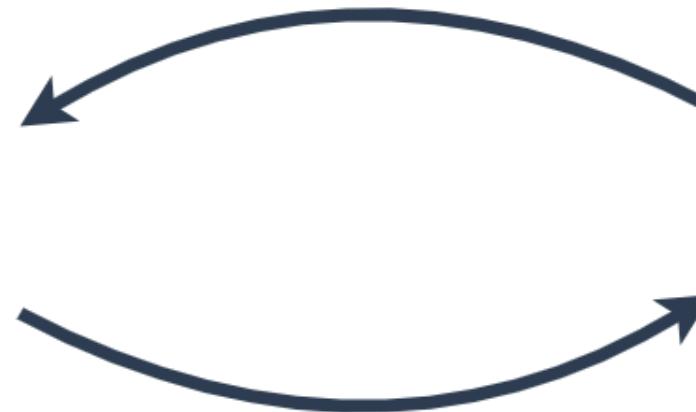


Domain experts  
User experience  
Training

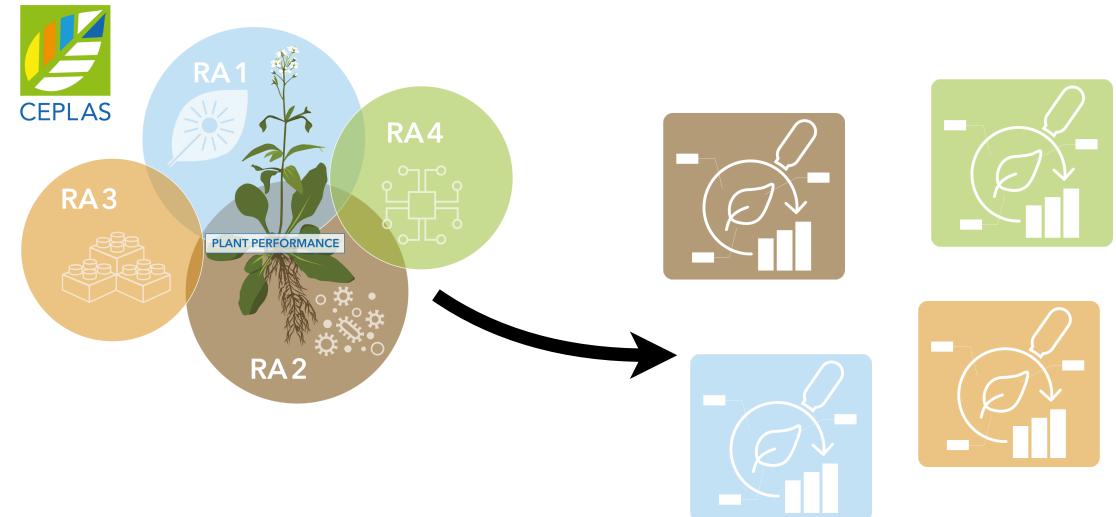
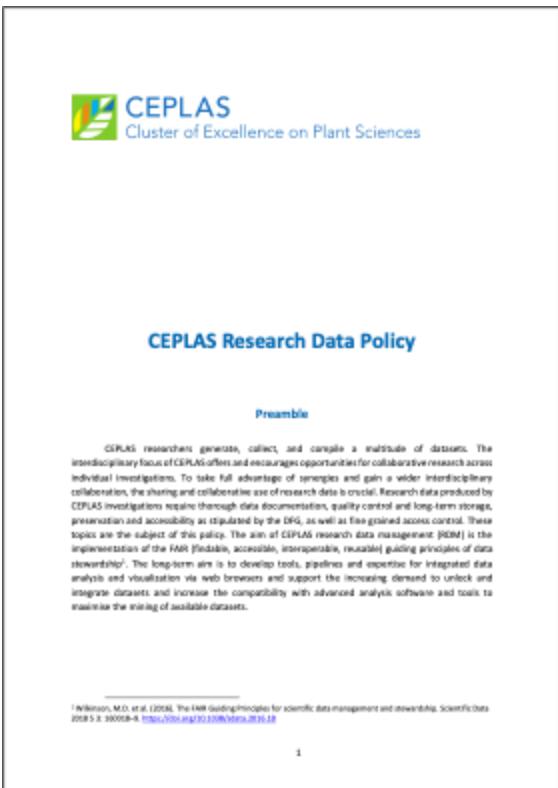
*nfdi4plants*



Service provider  
Developers  
Tech experts

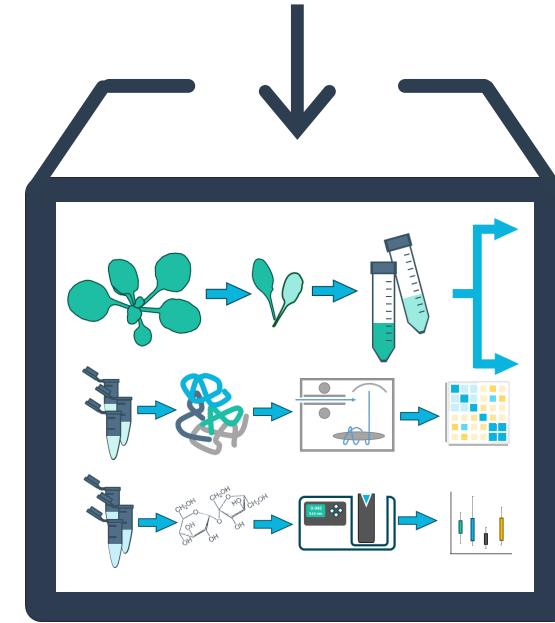
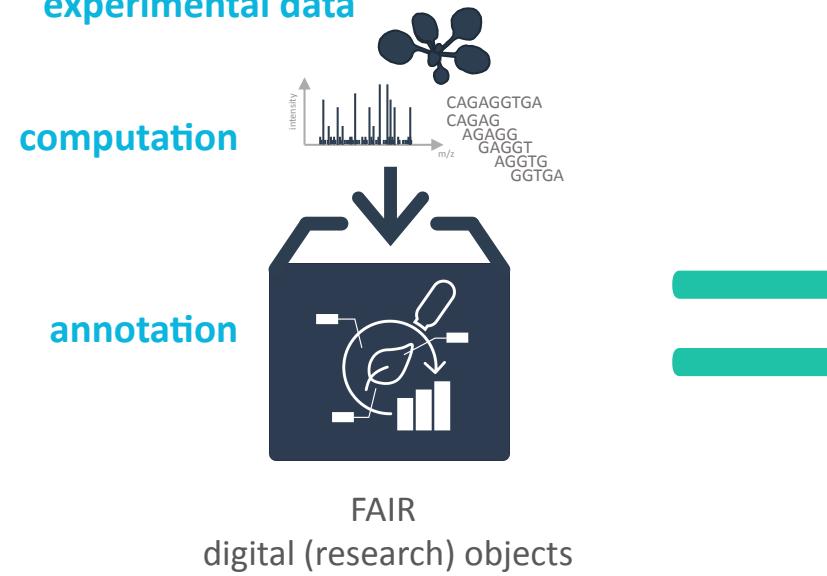


# CEPLAS Research Data Policy



The policy is available via [CEPLAS intranet](#)

# Annotated Research Context (ARC)

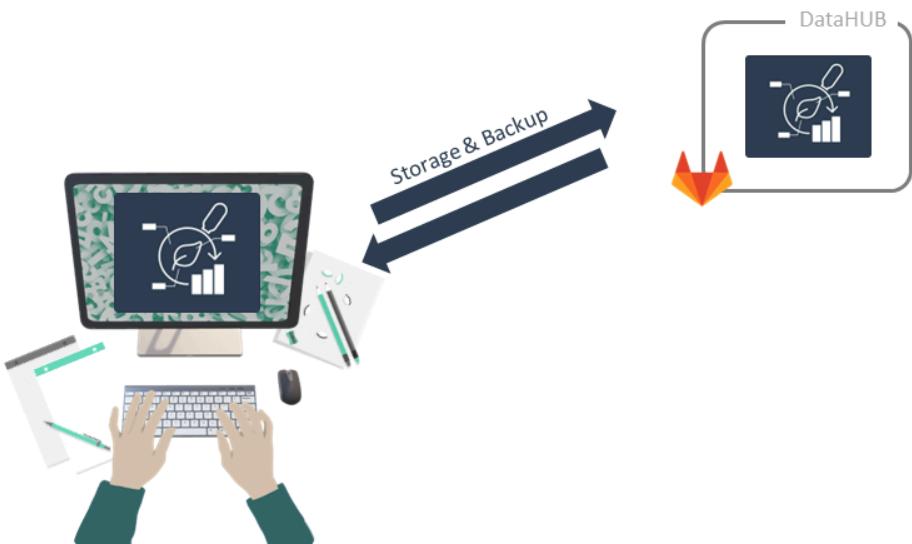


Your entire investigation in a single unified bag

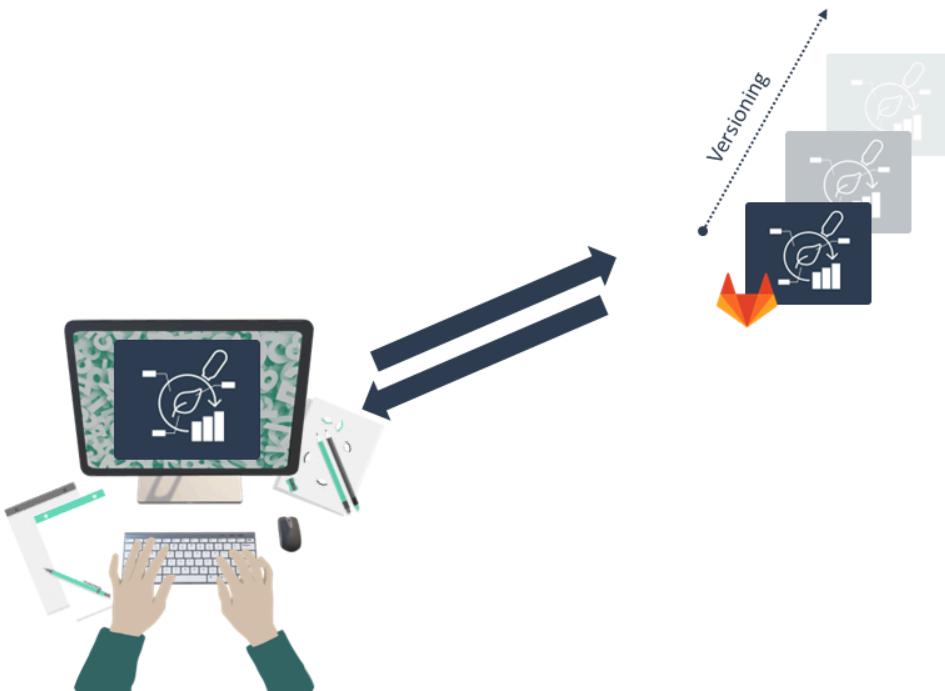
# You can store your ARC in the DataHUB



# You can store your ARC in the DataHUB



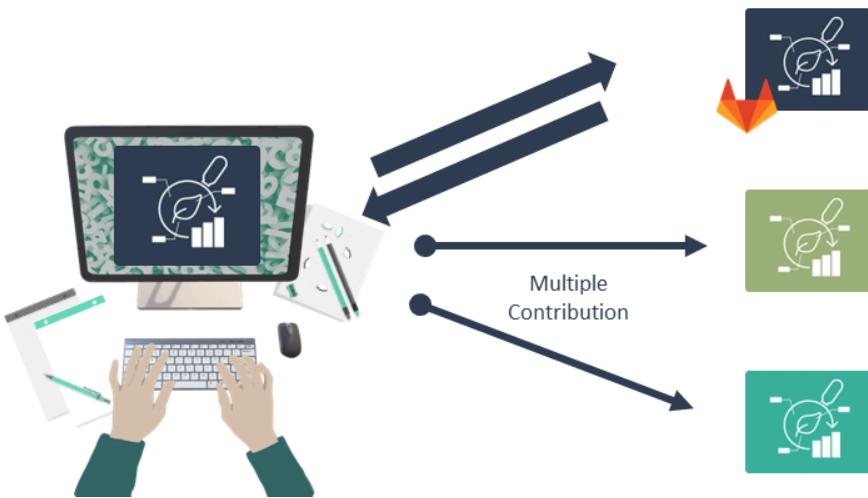
# ARCs are versioned



# You can invite collaborators



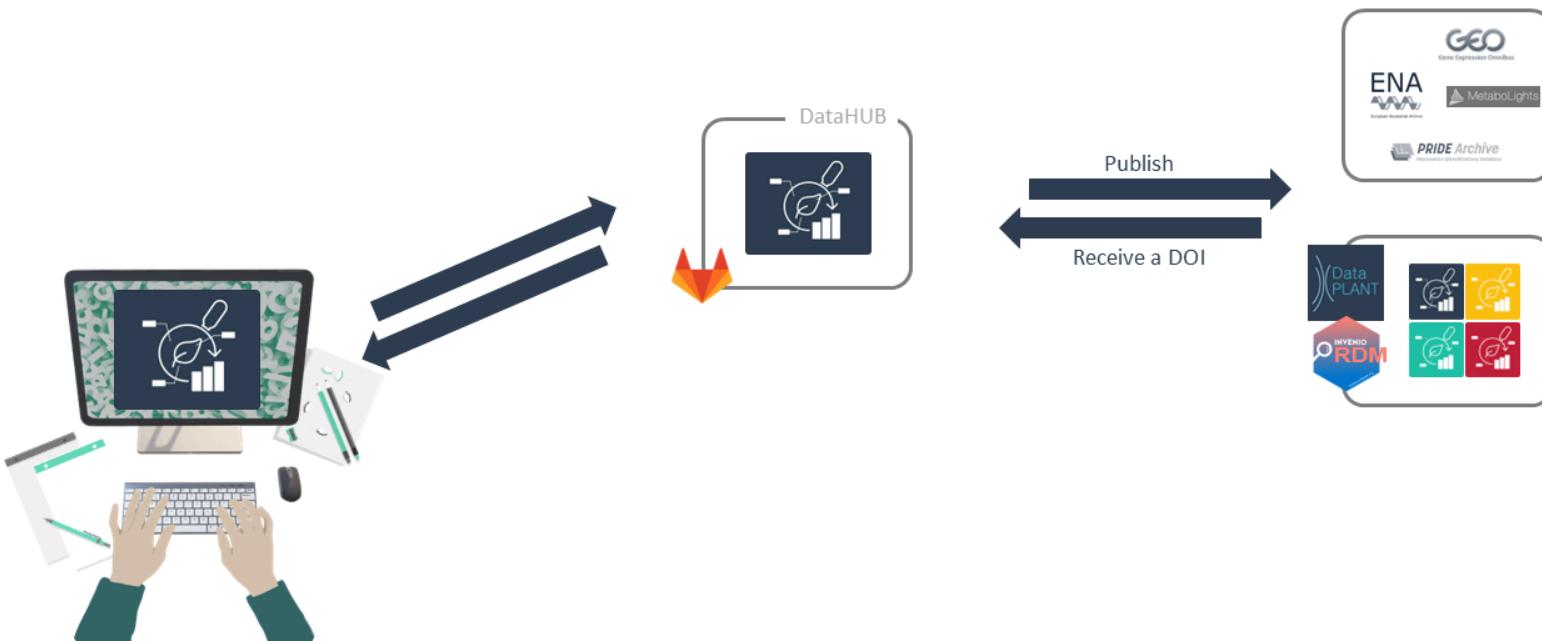
# Collaborate and contribute



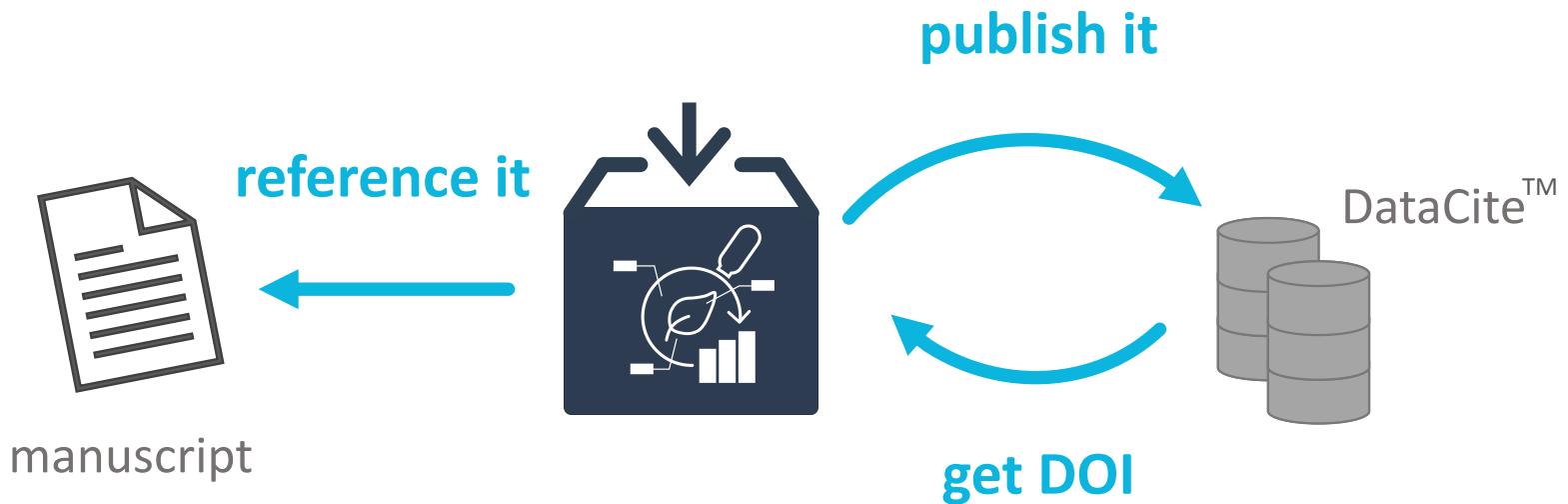
# Reuse data in ARCs



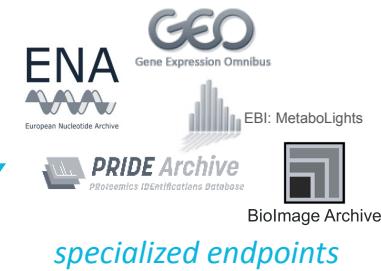
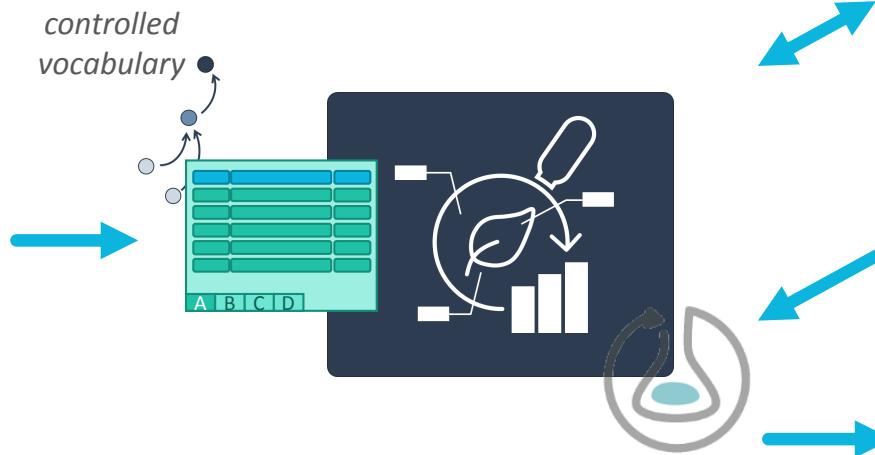
# Publish your ARC



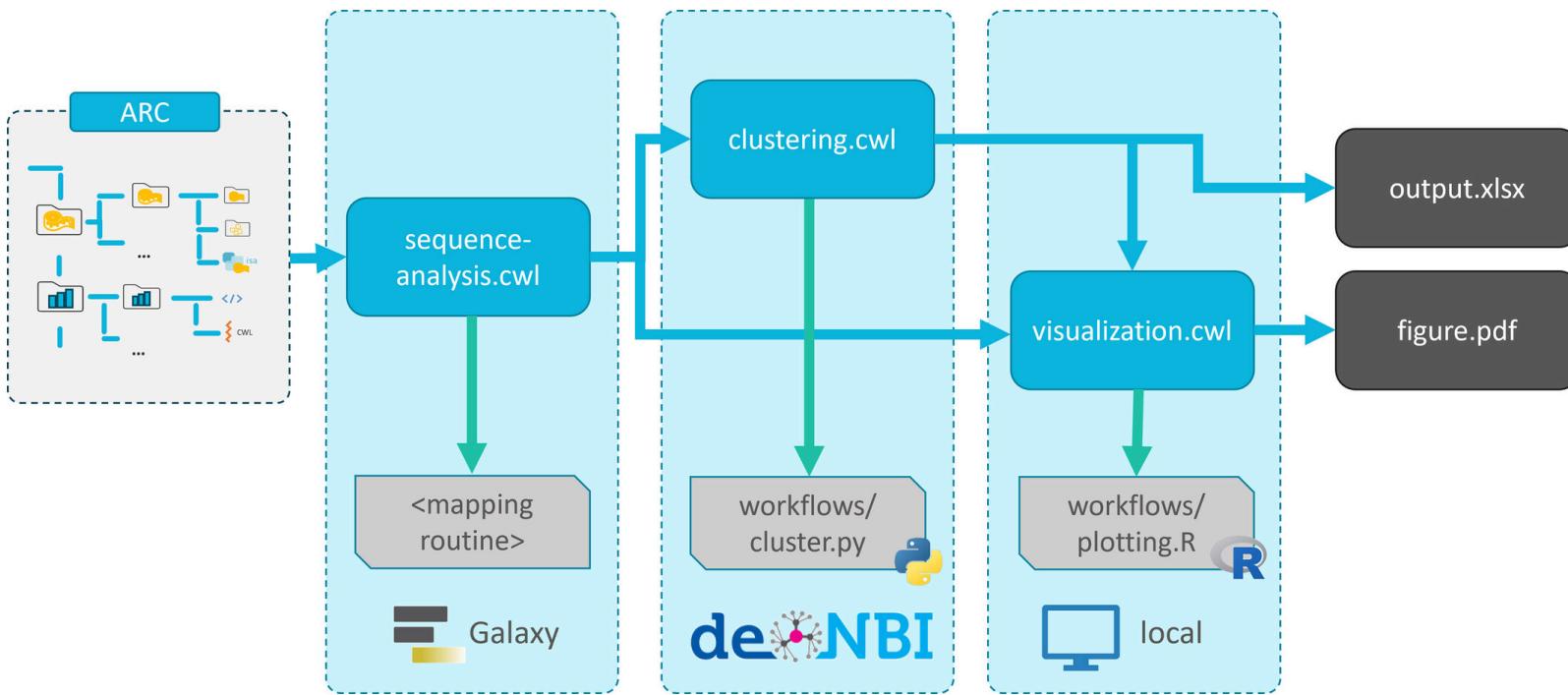
# Publish your ARC, get a DOI



# ARC as single-entry point

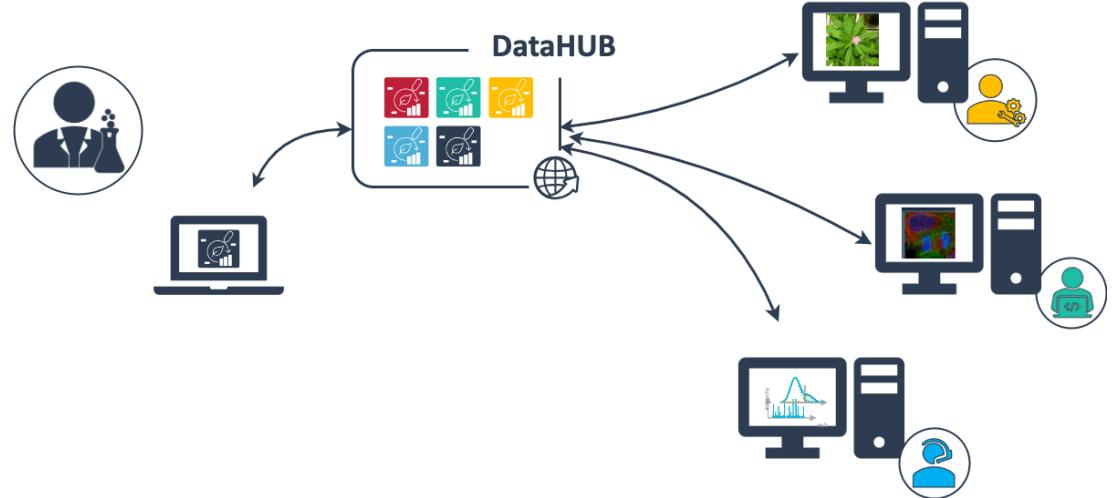


# Data analysis and workflows

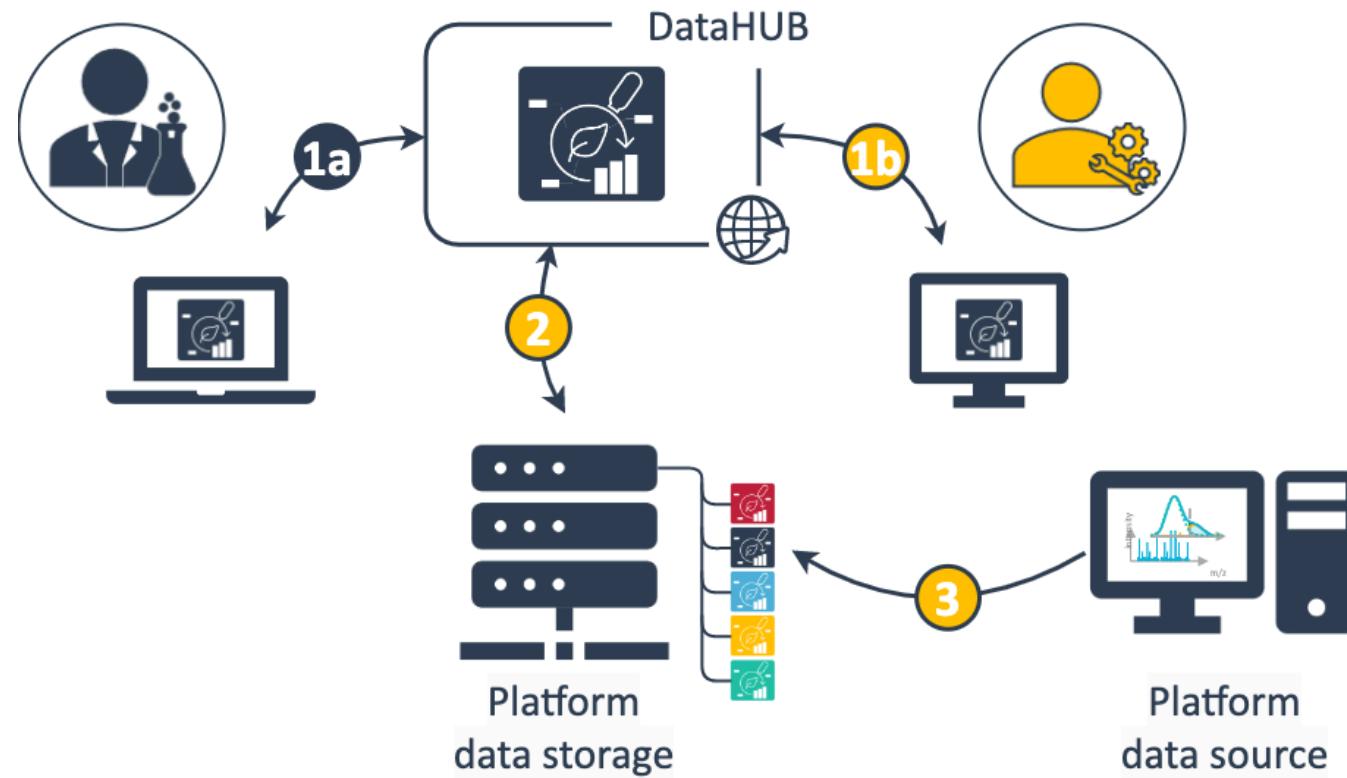


# Enabling platforms

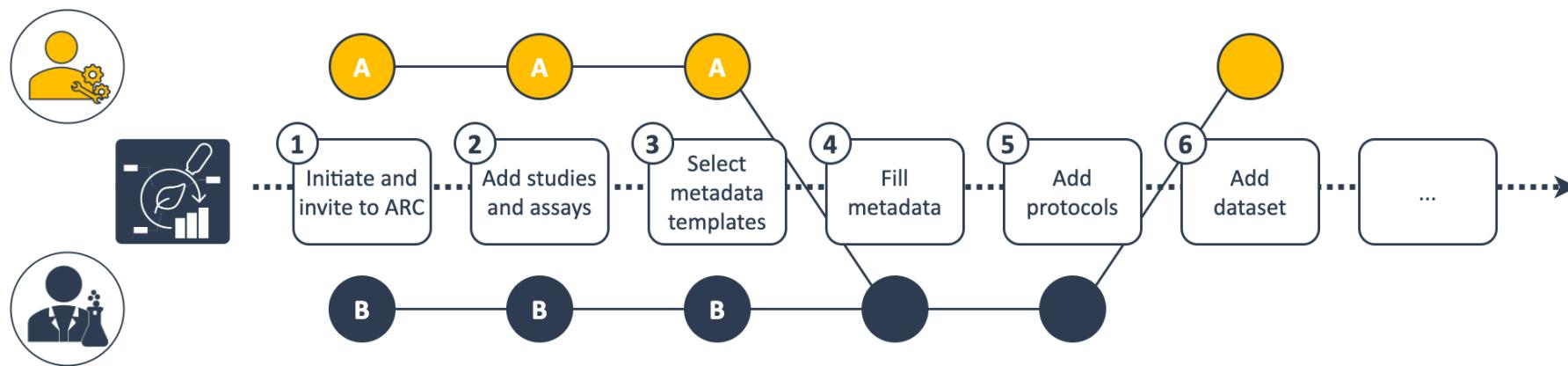
- Streamlined exchange of (meta)data
- Communication and project management



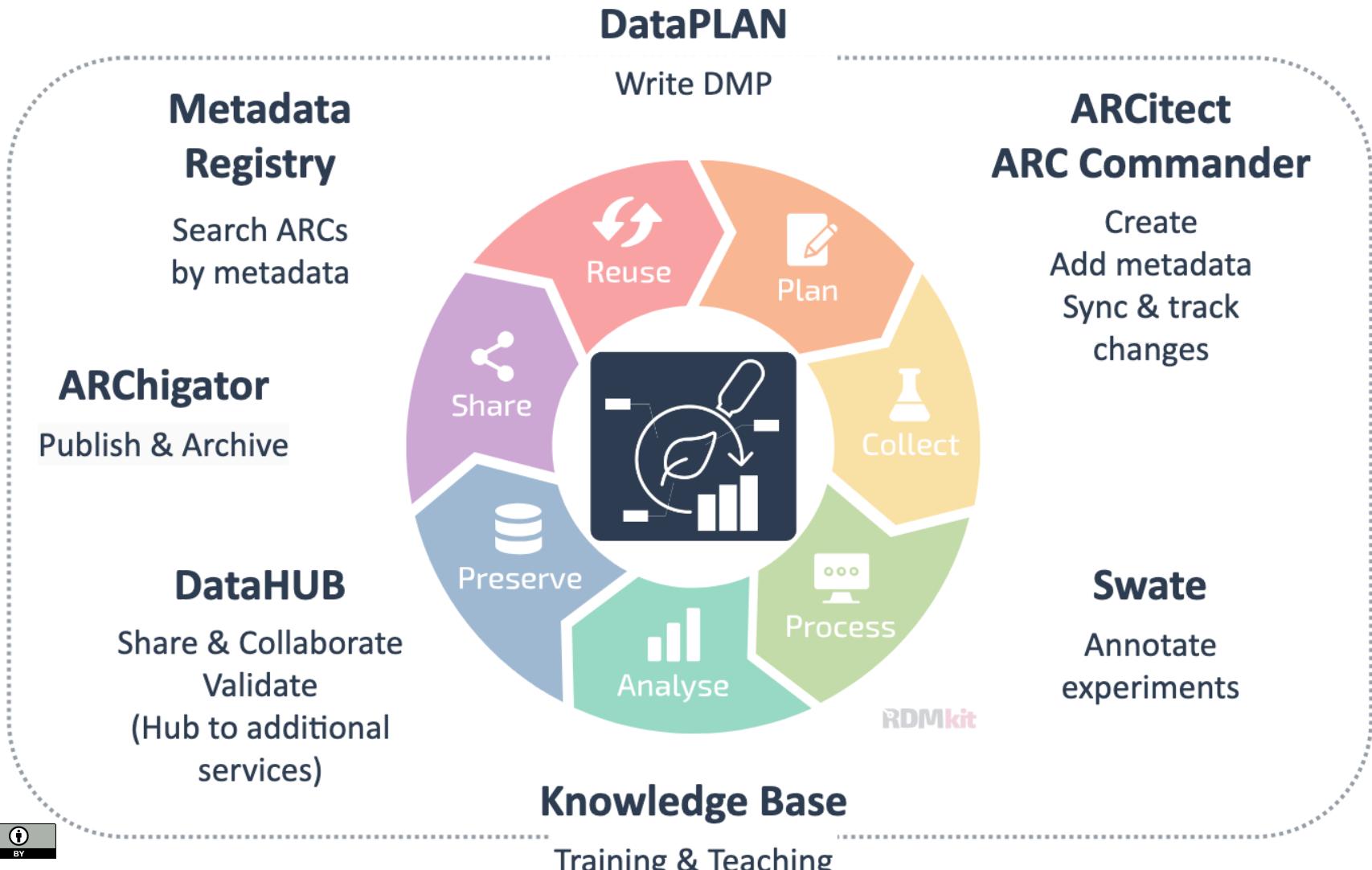
# Streamlined data exchange



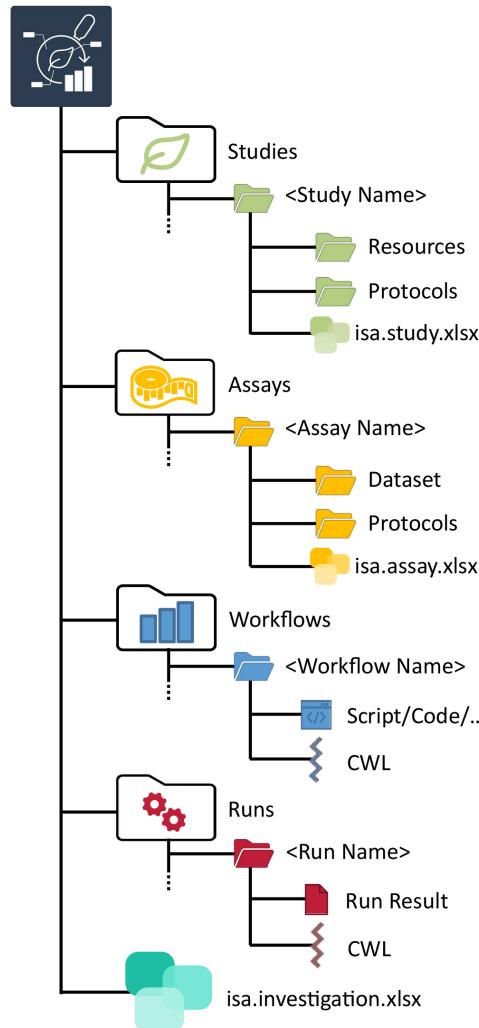
# Meet your collaborators in an ARC



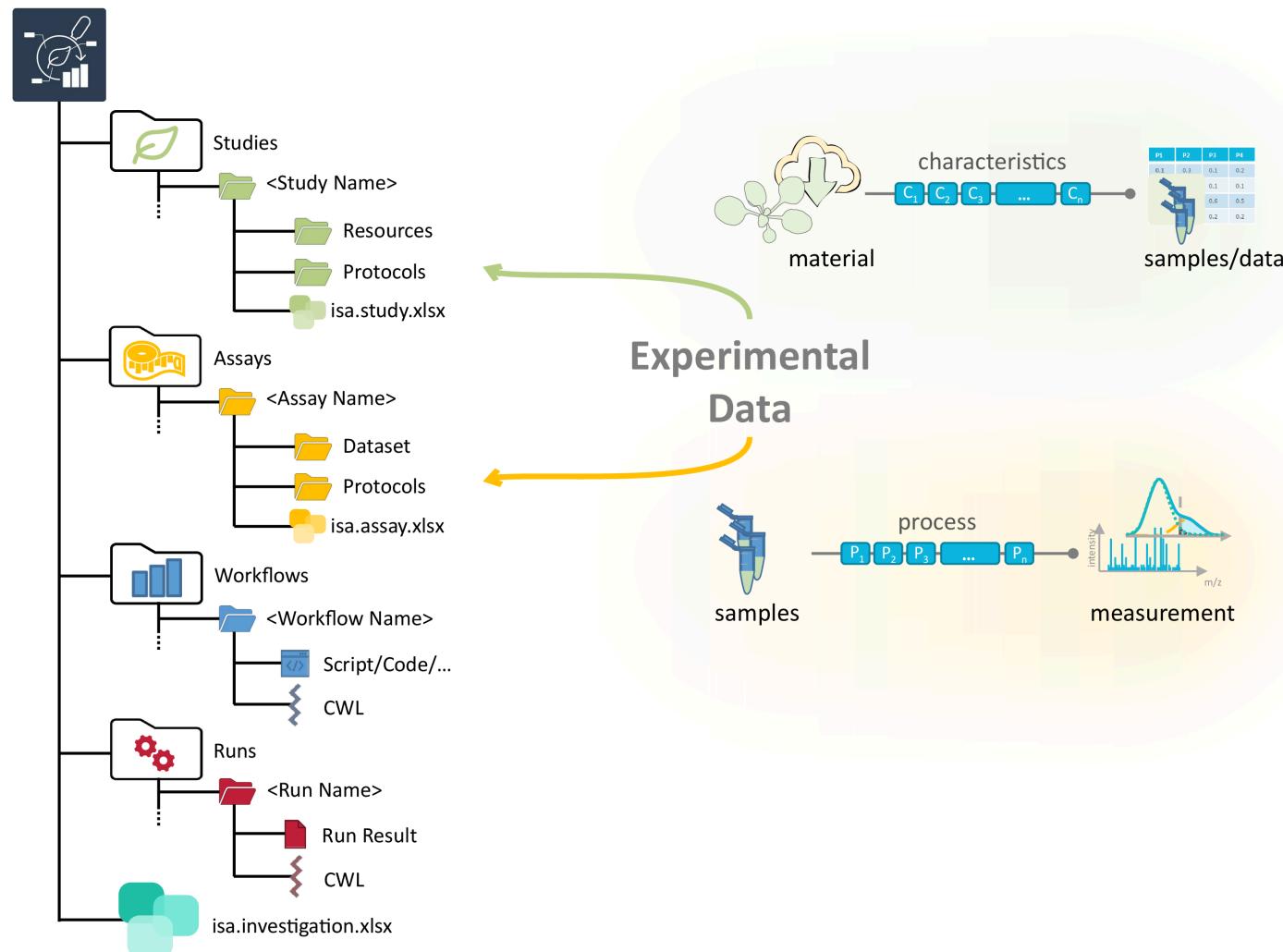
# The ARC ecosystem



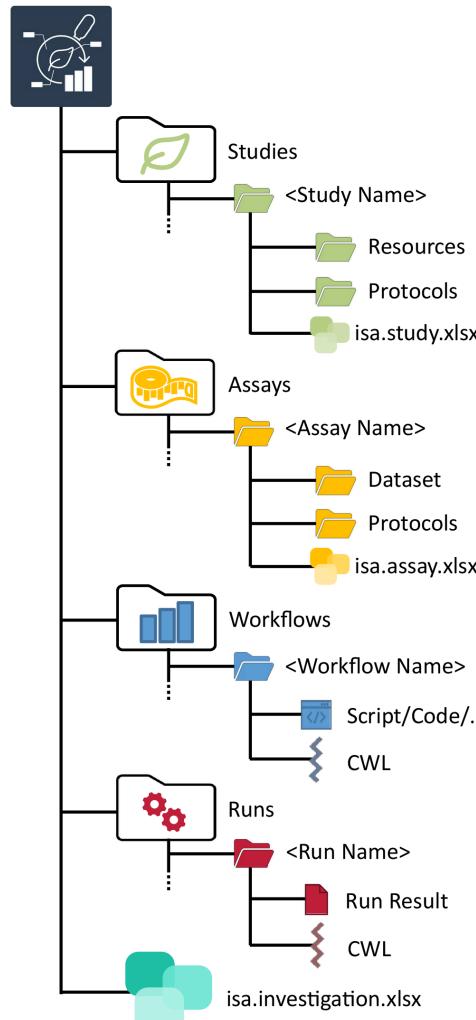
# What does an ARC look like?



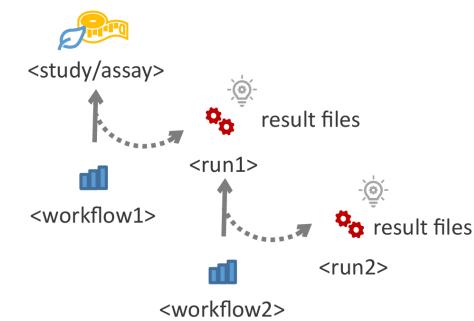
# ARCs store experimental data



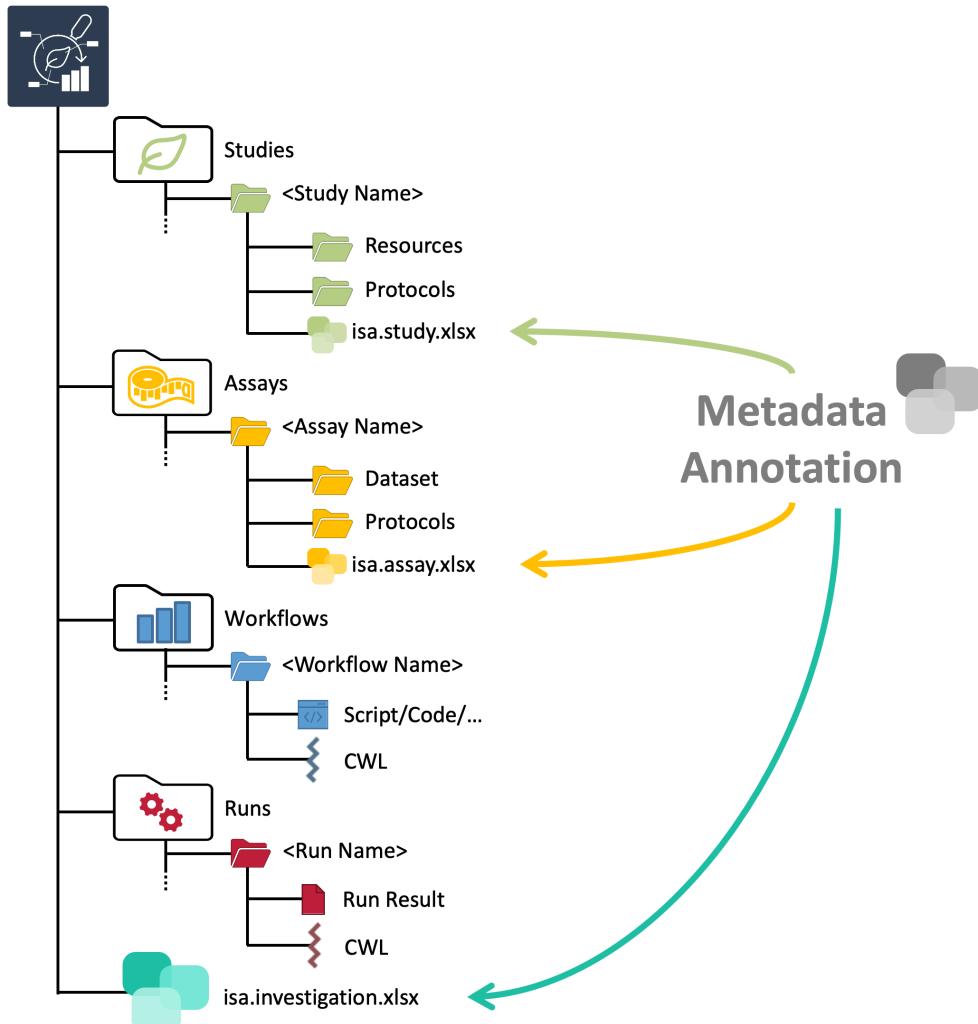
# Computations can be run inside ARCs



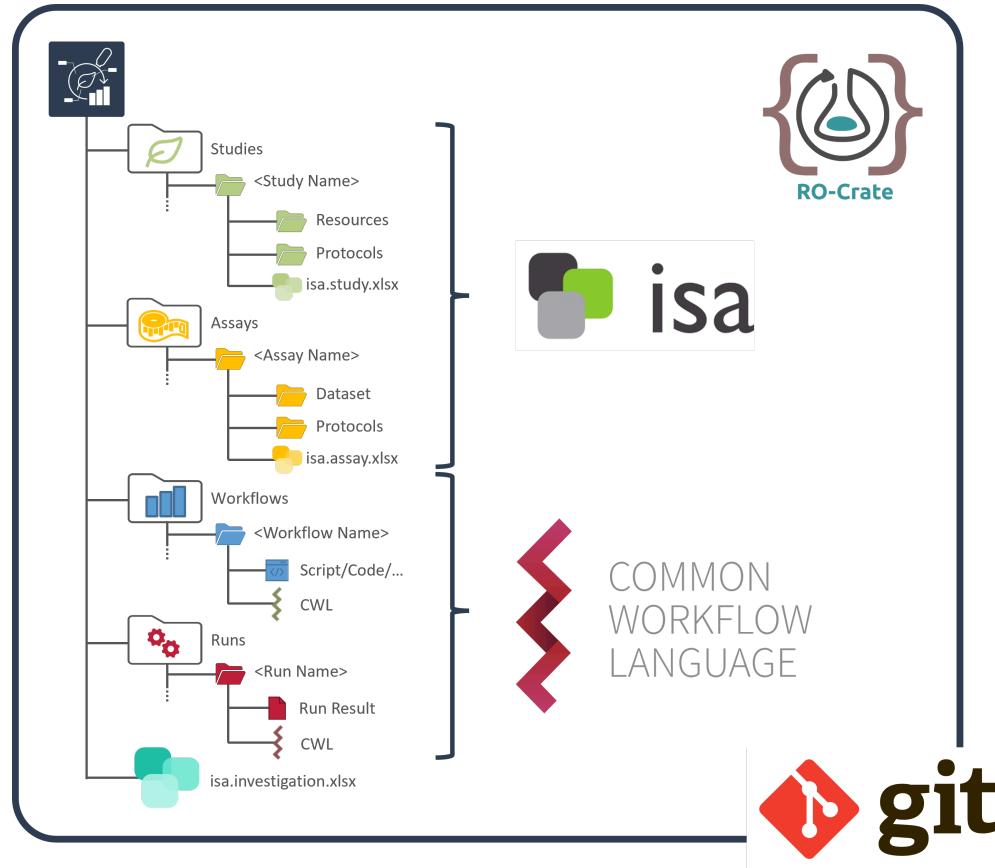
Data analysis  
Computation



# ARCs come with comprehensive metadata



# ARC builds on standards



## RO-Crate

- standardized exchange
- <https://www.researchobject.org/ro-crate/>

## ISA

- structured, machine-readable metadata
- <https://isa-tools.org/>

## CWL

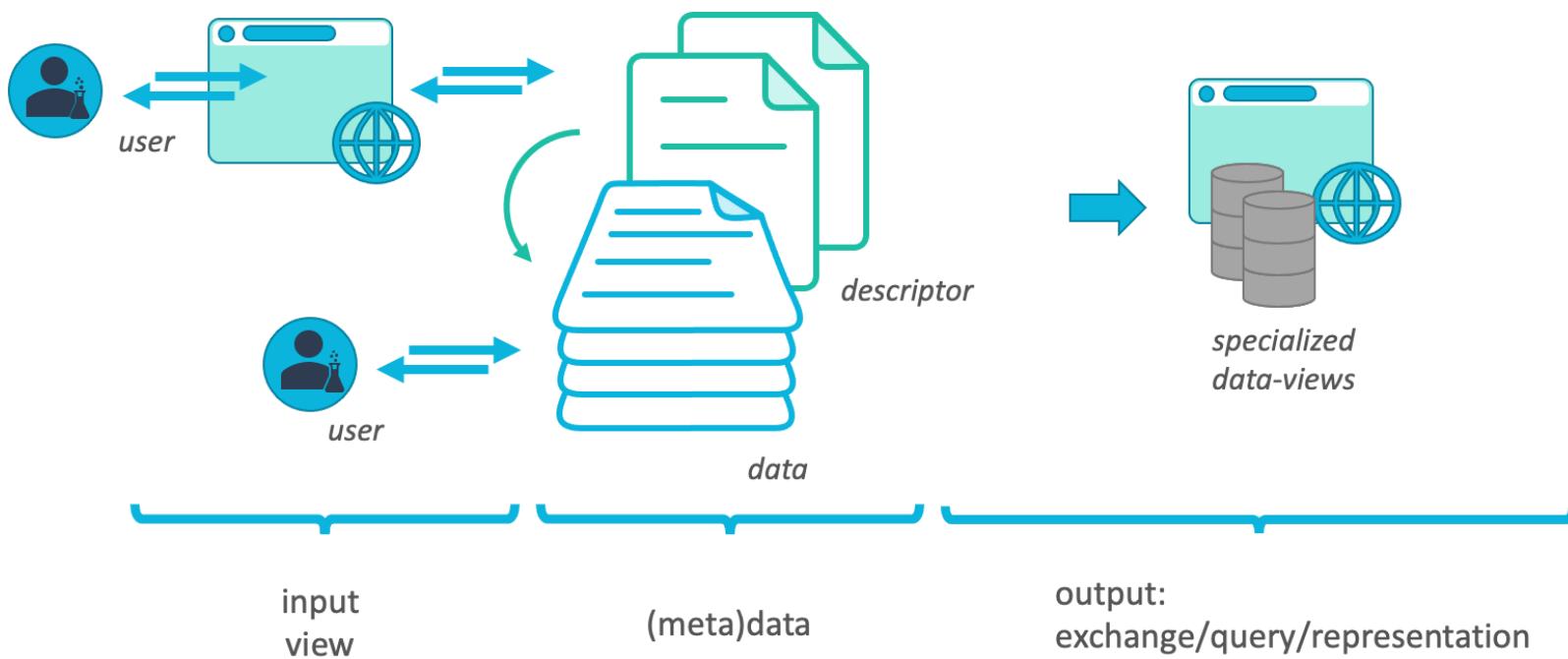
- reproducible, re-usable data analysis
- <https://www.commonwl.org/>

## Git

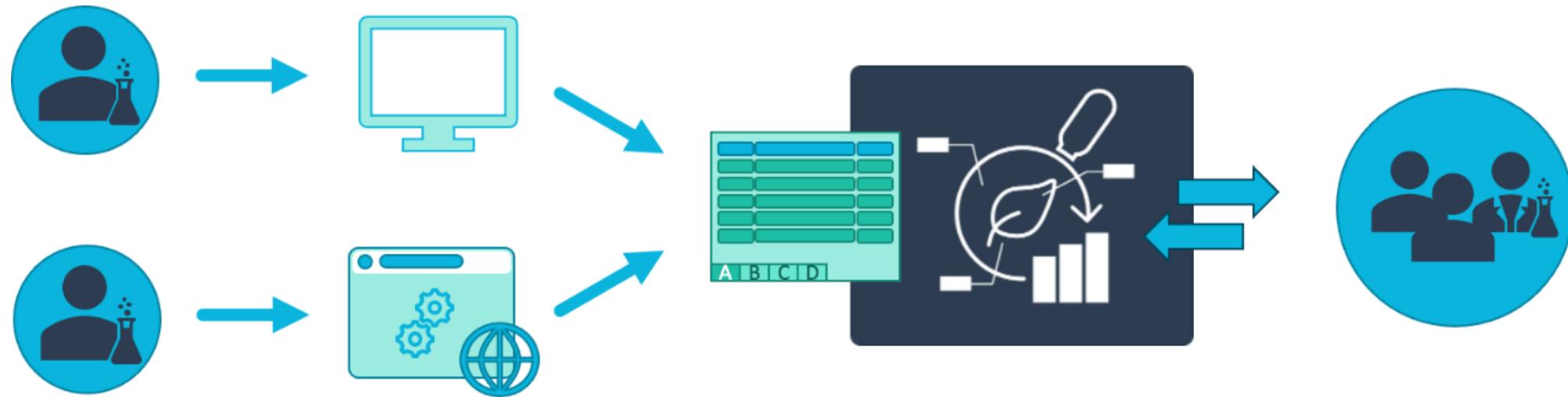
- version control
- <https://git-scm.com>

# Everything is a file

The ARC is a **data-centric** approach to RDM



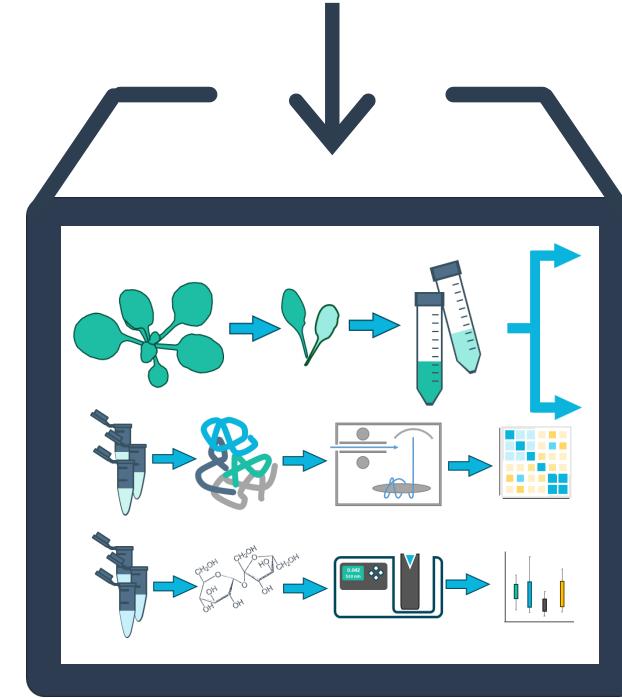
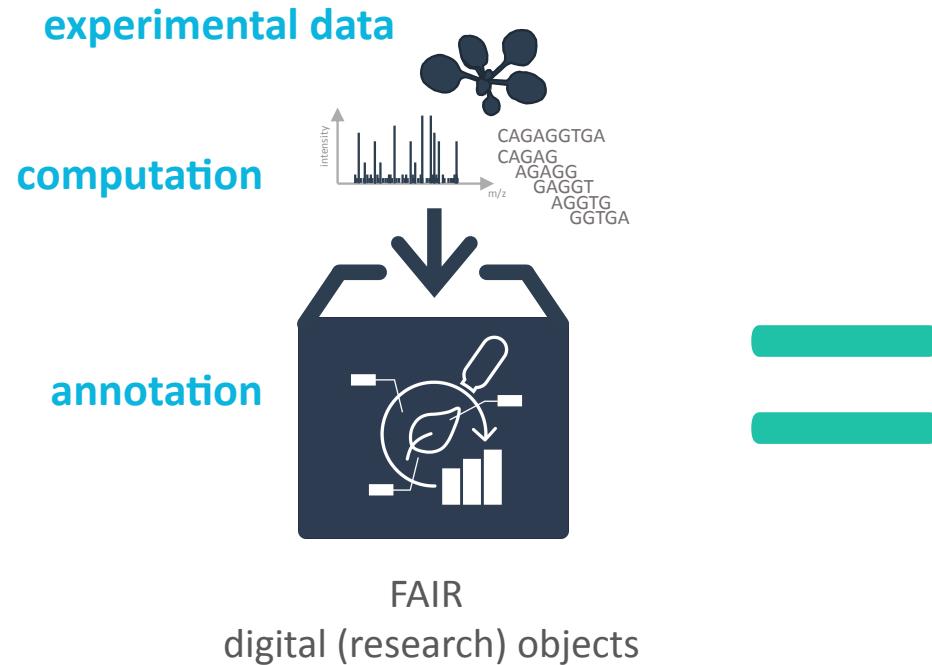
# No technical lock-in



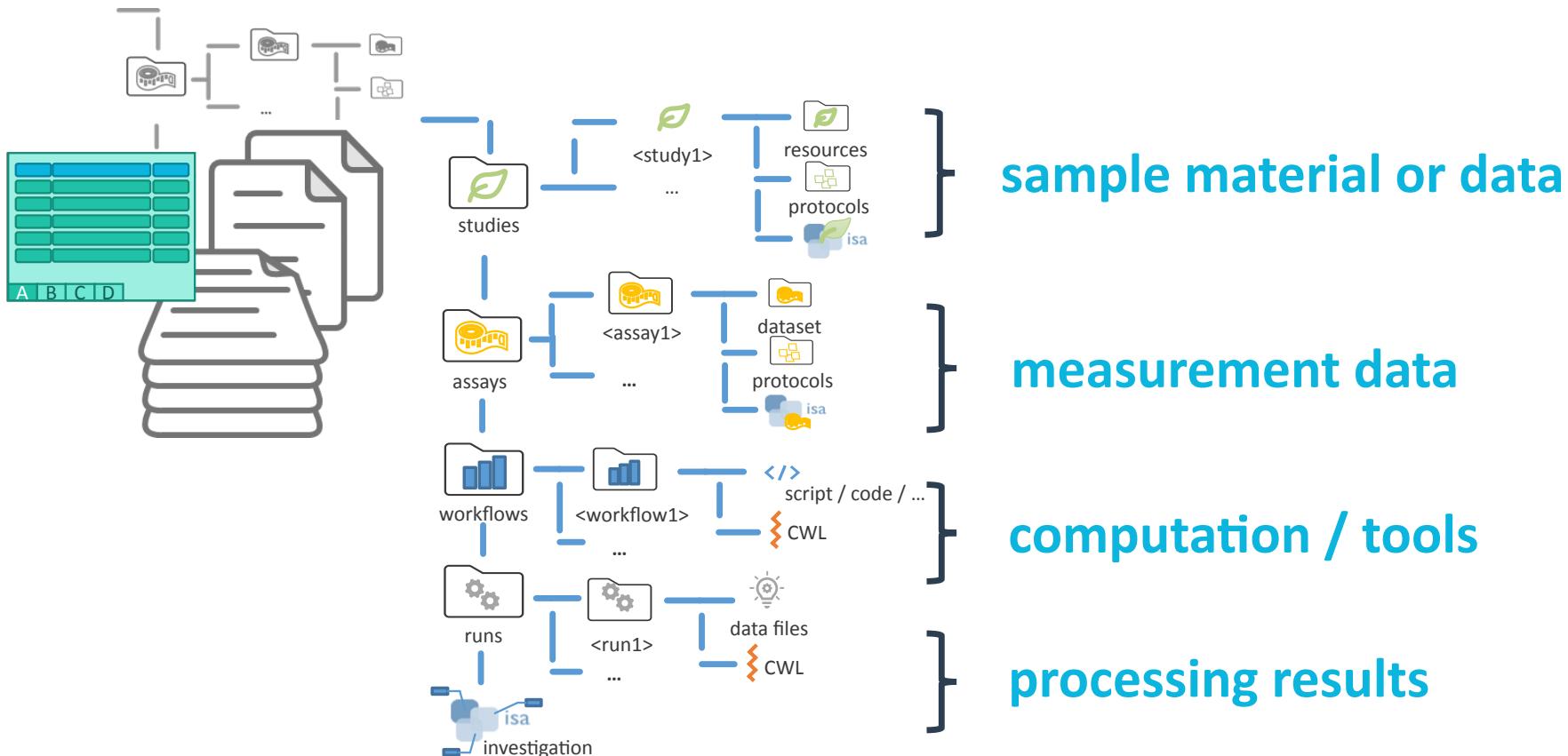
(Meta)data transparency with tool assistance but **no technical lock-in**

# Hands-on part 1: Setup and ARCitect

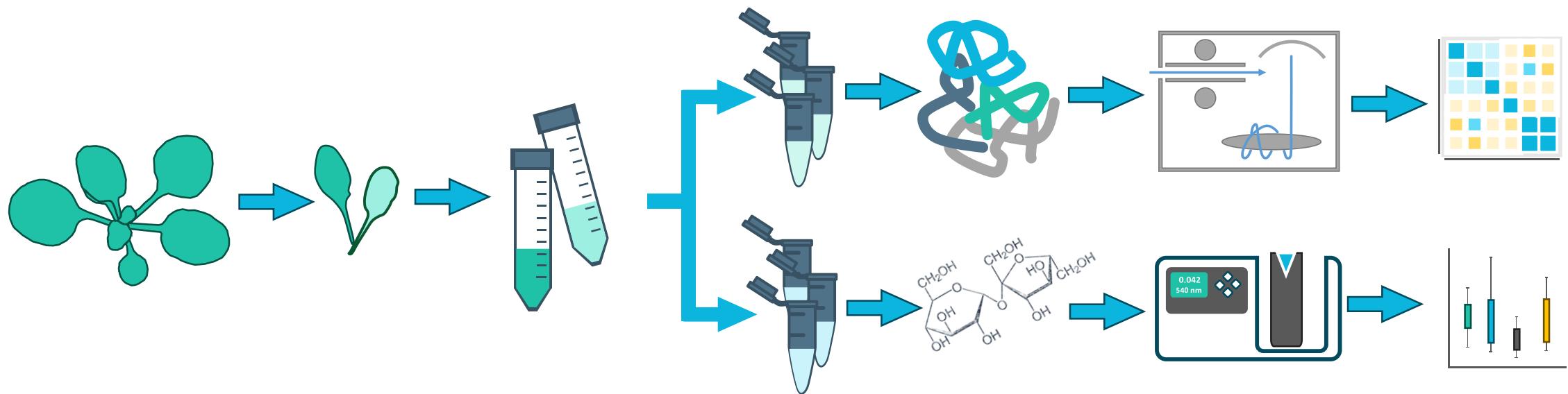
# ARC: Annotated research context



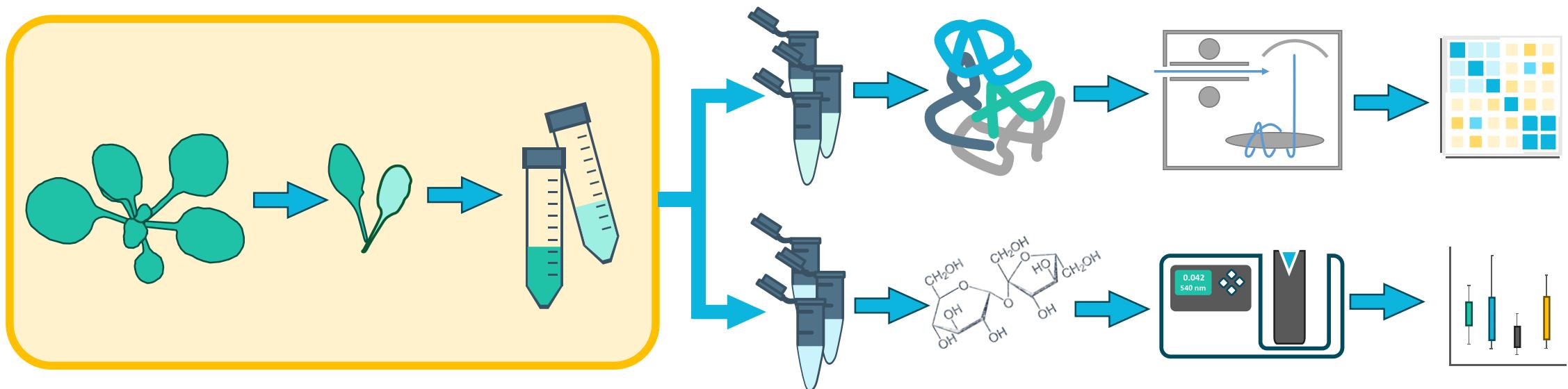
# The ARC scaffold structure



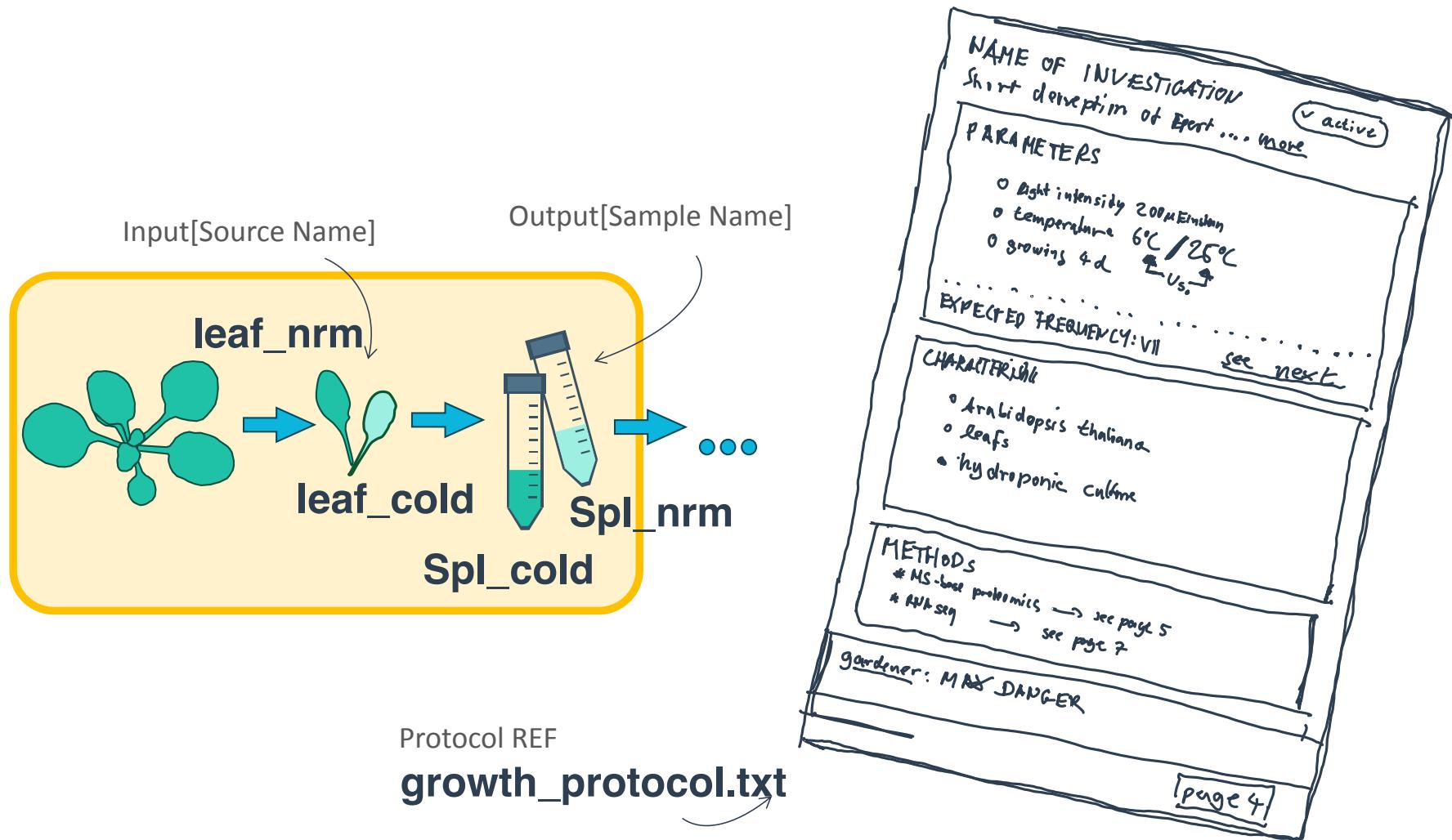
# A small prototypic project



# Divide and conquer for reproducibility



# Identifying the 'study' part



# A table-based organization schema

Input[Source Name]		Output[Sample Name]
leaf_nrm		spl_nrm
leaf_cold		spl_cold
A	B	C
D		

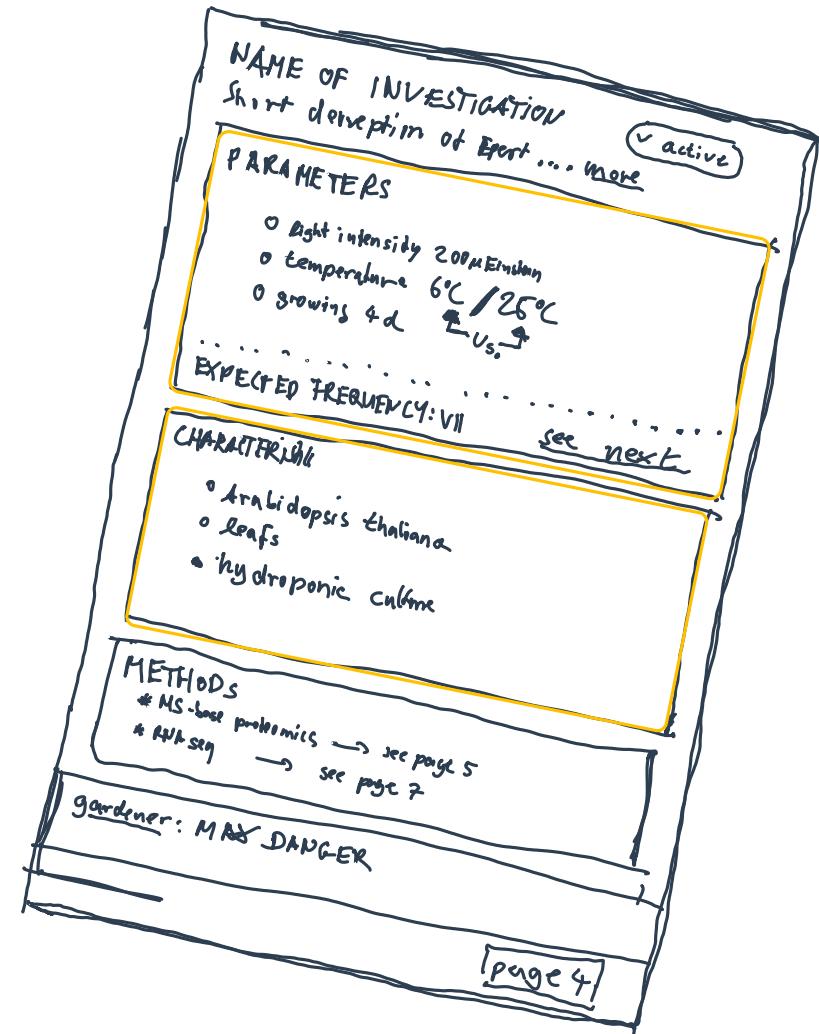
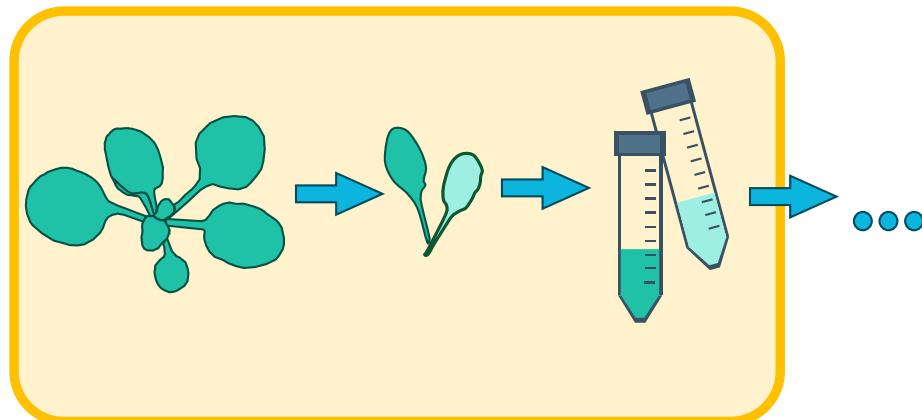
# Referencing a protocol

This allows you to reference the free-text, human-readable protocol.

Input[Source Name]	Protocol REF	Output[Sample Name]
leaf_nrm	growth_protocol.txt	spl_nrm
leaf_cold	growth_protocol.txt	spl_cold
A	B	C

- 💡 It is recommended that the protocol is in an open format (.md|.txt|.docx|...)
- 💡 But everything is possible also an URI to an electronic lab notebook

# Parameterizing the 'study'



# Finding the right metadata vocabulary

## Parameters []

- Light intensity 200 µEinstein
- Temperature 6°C / 25°C
- Growing 4d

## Characteristics []

- *Arabidopsis thaliana*
- Leaf
- Hydroponic culture
- Columbia

# OLS: Finding the right metadata vocabulary

Temperature Dependence [Temperature:Dependence\\_Annotation](#)

[http://purl.uniprot.org/core/Temperature\\_Dependence\\_Annotation](http://purl.uniprot.org/core/Temperature_Dependence_Annotation)

Indicates the optimum temperature for enzyme activity and/or the variation of enzyme activity with temperature variation; the thermostability/thermolability of the enzyme is also mentioned when it is known.

Ontology: [UNIPROT RDFS](#)

temperature [AFO:/result#AFR\\_0001584](#)

[http://purl.allotrope.org/ontologies/result#AFR\\_0001584](http://purl.allotrope.org/ontologies/result#AFR_0001584)

A temperature (datum) is a quantity facet that quantifies some temperature. [Allotrope]

Ontology: [AFO](#)

temperature [FBcv:0000466](#)

[http://purl.obolibrary.org/obo/FBcv\\_0000466](http://purl.obolibrary.org/obo/FBcv_0000466)

Mutation caused by exposure to a temperature that is higher or lower than 25 degrees Celsius.

Ontology: [FBCV](#)

temperature [PATO:0000146](#)

[http://purl.obolibrary.org/obo/PATO\\_0000146](http://purl.obolibrary.org/obo/PATO_0000146)

A physical quality of the thermal energy of a system.

Ontology: [PATO](#)

Also appears in: [NGBO](#) [HTN](#) [CAO](#) [ZP](#) [AGRO](#) [OMIABIS](#) [OBIB](#) [MONDO](#) [TXPO](#) [MCO](#) +

Welcome to the EMBL-EBI Ontology Lookup Service

temperature

Exact match  Include obsolete terms  Include imported terms

Examples: diabetes, GO:0098743

Looking for a particular ontology?

About OLS

The Ontology Lookup Service (OLS) is a repository for biomedical ontologies that aims to provide a single point of access to the latest ontology versions. You can browse the ontologies through the website as well as programmatically via the OLS API. OLS is developed and maintained by the Samples, Phenotypes and Ontologies Team (SPOT) at EMBL-EBI.

Related Tools

In addition to OLS the SPOT team also provides the Oxo and ZOOMA services. Oxo provides cross-ontology mappings between terms from different ontologies. ZOOMA is a service to assist in mapping data to ontologies in OLS.

Report an Issue

For feedback, enquiries or suggestion about OLS or to request a new ontology please use our GitHub issue tracker. For announcements relating to OLS, such as new releases and new features sign up to the OLS announce mailing list.

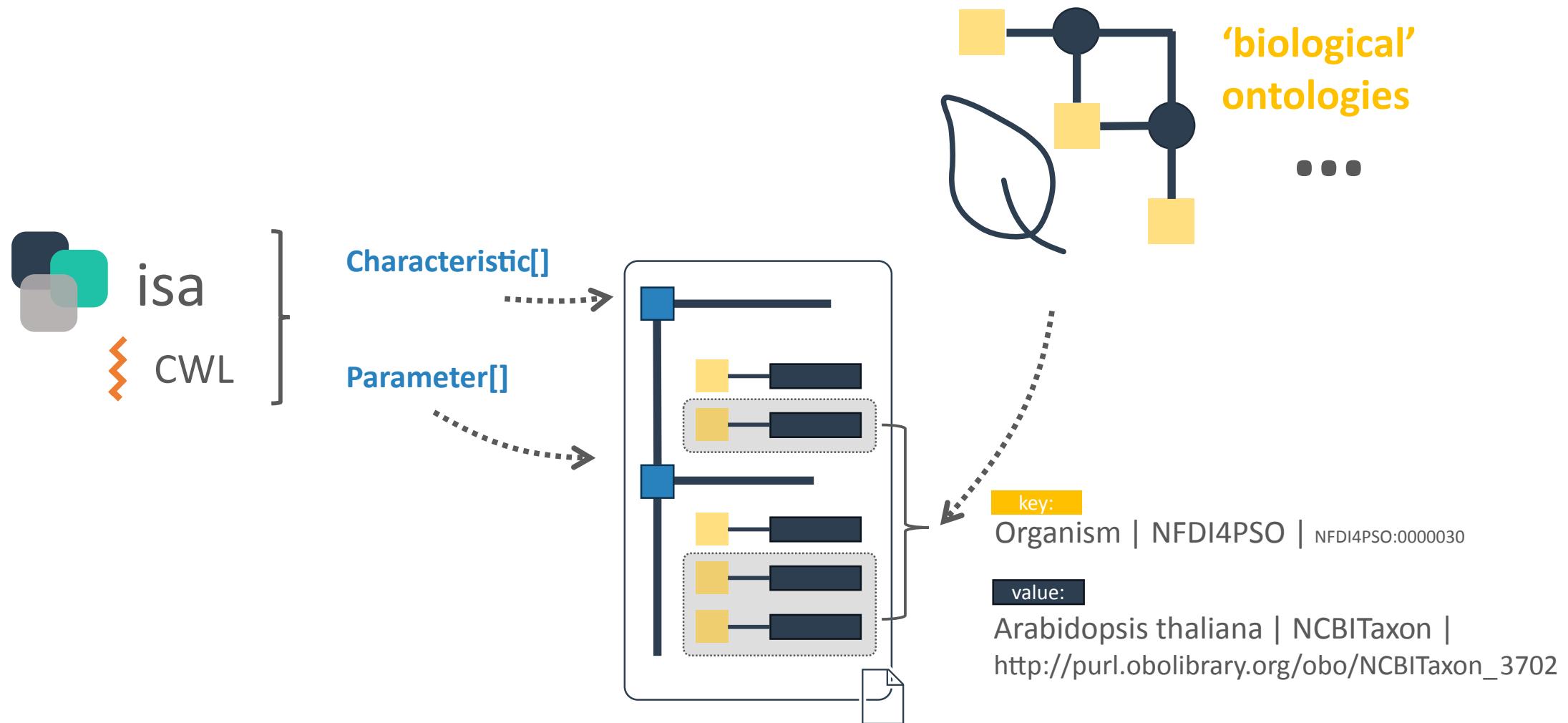
FOLLOW US

X

EMBL-EBI 2023 Licensing

Ontology Lookup Service (OLS): <https://www.ebi.ac.uk/ols4/>

# Finding the metadata vocabulary and descriptors



# Finding the metadata vocabulary and descriptors

## Parameters []

- 
- 
- 
-  Light intensity 200  $\mu$ Einstein
-  Temperature 6°C / 25°C
-  Growing 4d

## Characteristics []

- 
- 
- 
-  *Arabidopsis thaliana*
-  Leaf
-  Hydroponic culture
-  Columbia

# Finding the metadata vocabulary and descriptors

## Parameters []

- █ Light intensity
  - █ 200 µEinstein
- █ Temperature
  - █ 6°C / 25°C
- █ Growth time
  - █ 4d

## Characteristics []

- █ Organism
  - █ *Arabidopsis thaliana*
- █ Tissue
  - █ Leaf
- █ Growth medium
  - █ Hydroponic culture
- █ Ecotype
  - █ Columbia

## Hands-on part 1: Setup and ARCitect

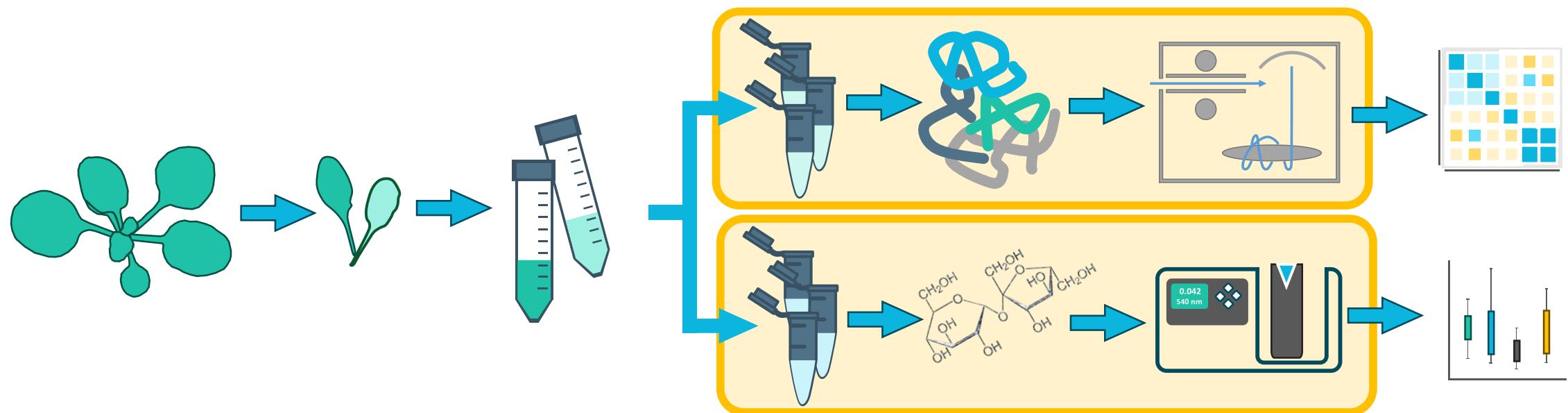
Follow the [Start Here guide](#) in the DataPLANT knowledge base.



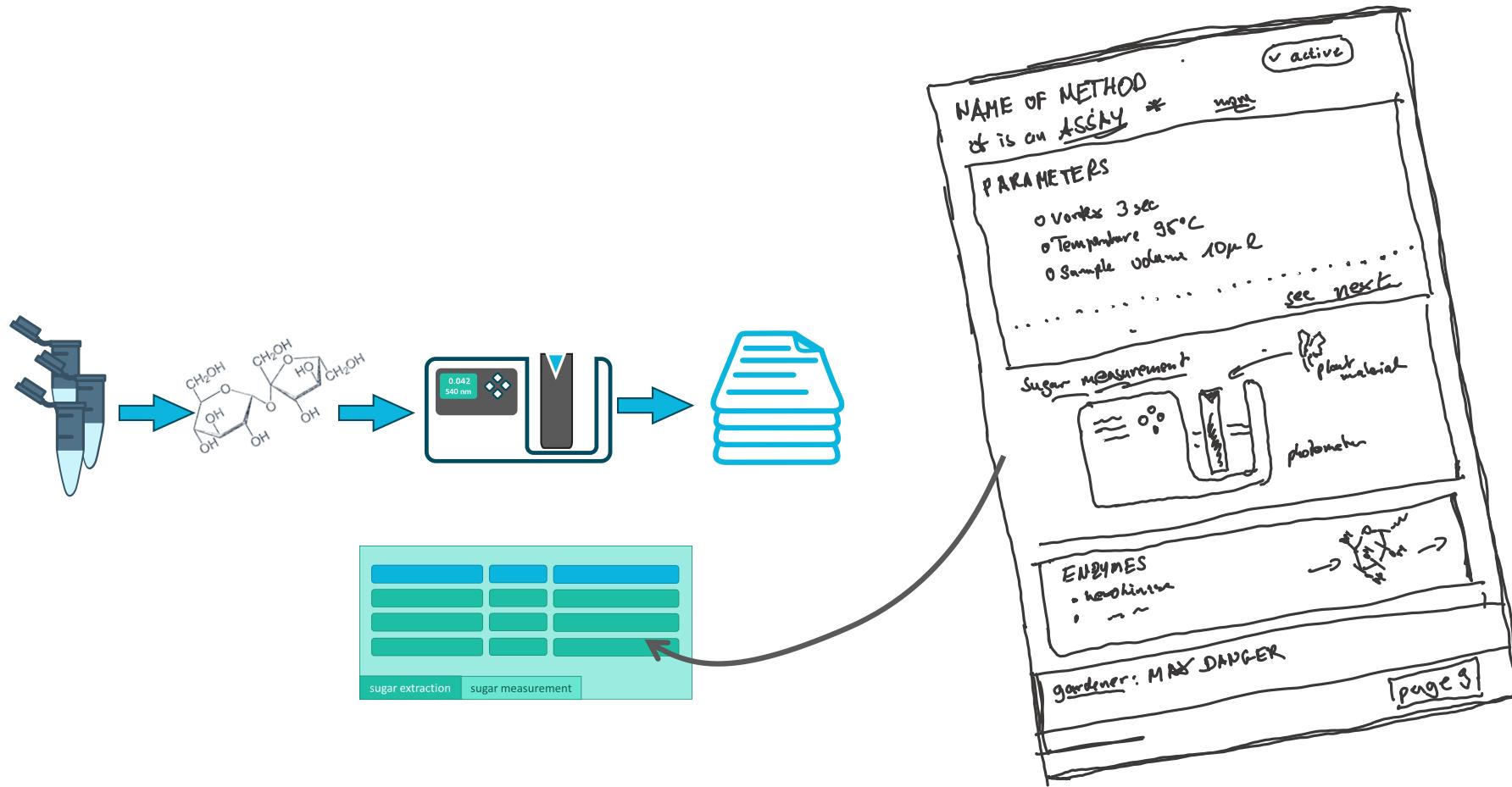
Until step **Add a study**

## Hands-on part 2: ARCitect (and Swate)

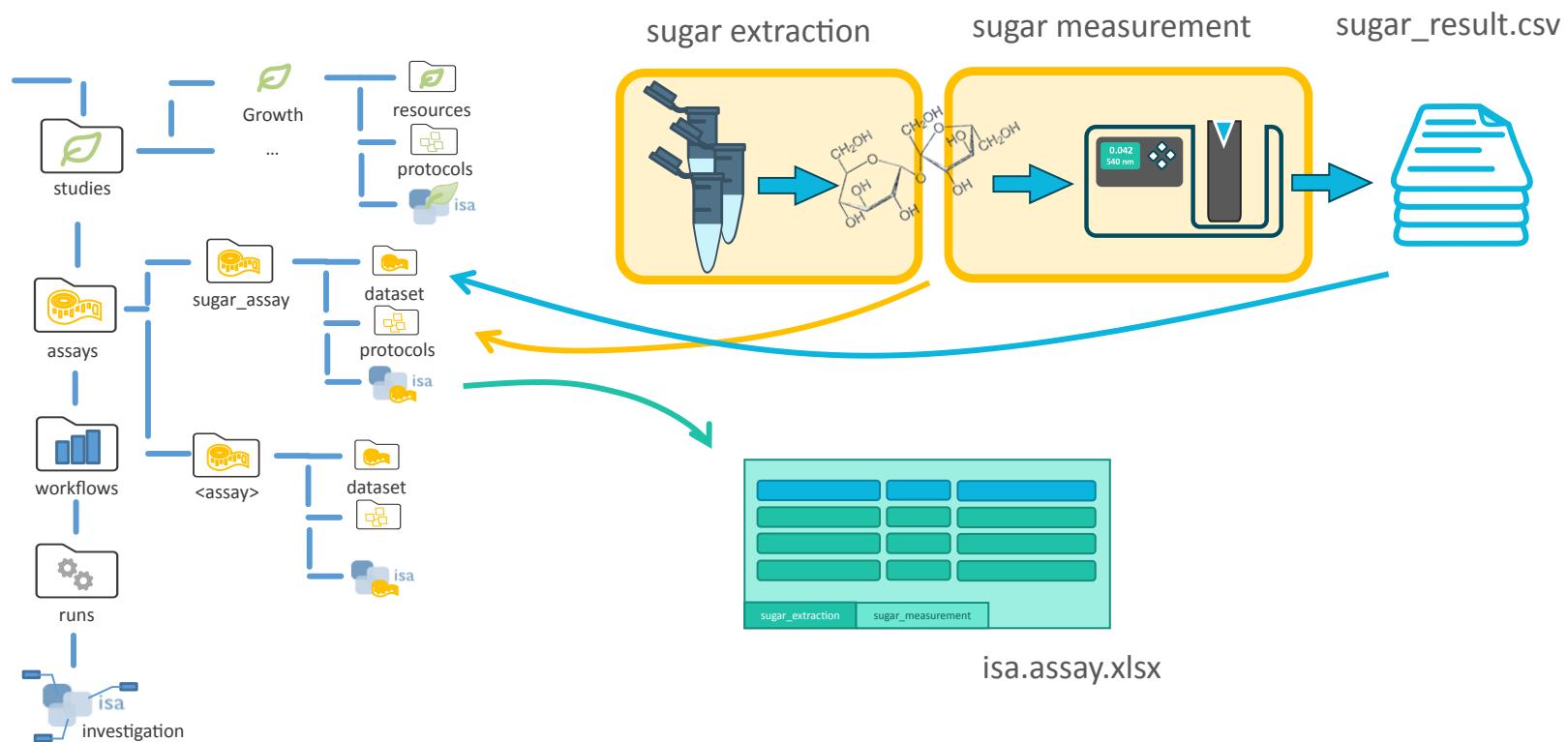
# Identifying assays



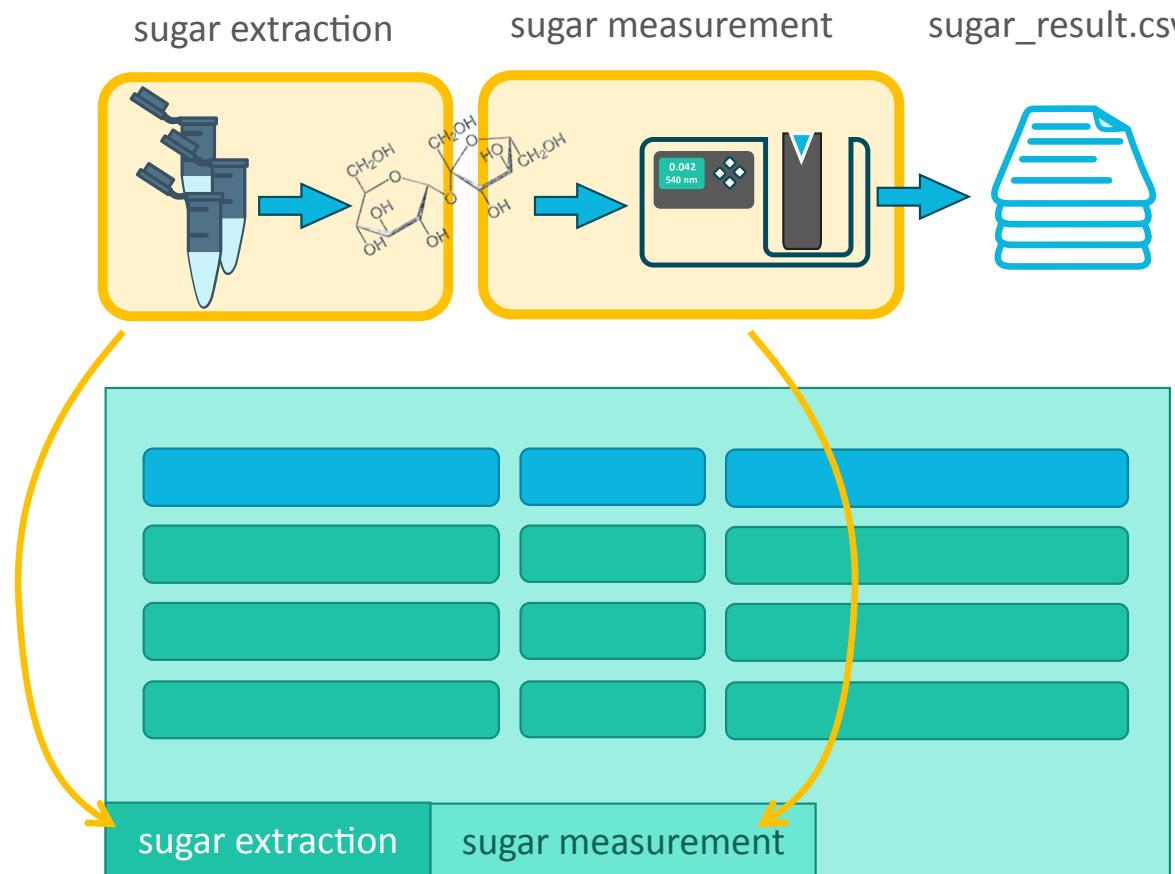
# Assay for sugar measurement



# Separating different assay elements



# Isolating the lab processes in an assay



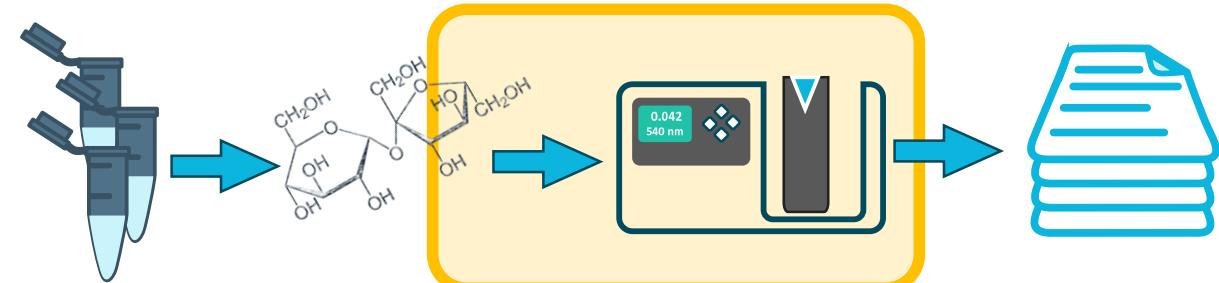
# Parameteterization: sugar extraction

- Vortex Mixer
  - 3 seconds
- Temperature
  - 95 degree celsius



# Parameteterization: sugar measurement

- technical replicate
  - 1,2,3,...
- sample volume
  - 10 microliter
- buffer volume
  - 190 microliter
- cycle count
  - 5



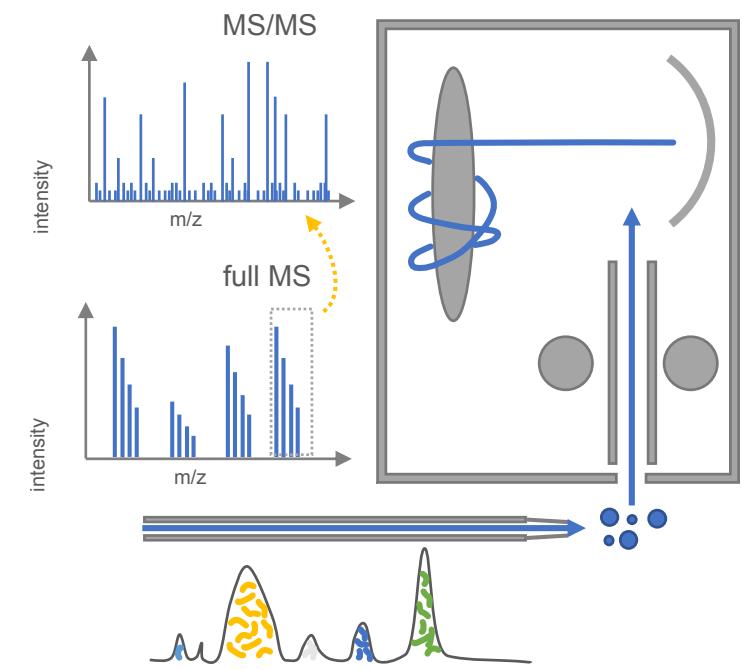
# Save time using standard methods and SOPs

## Parameter []

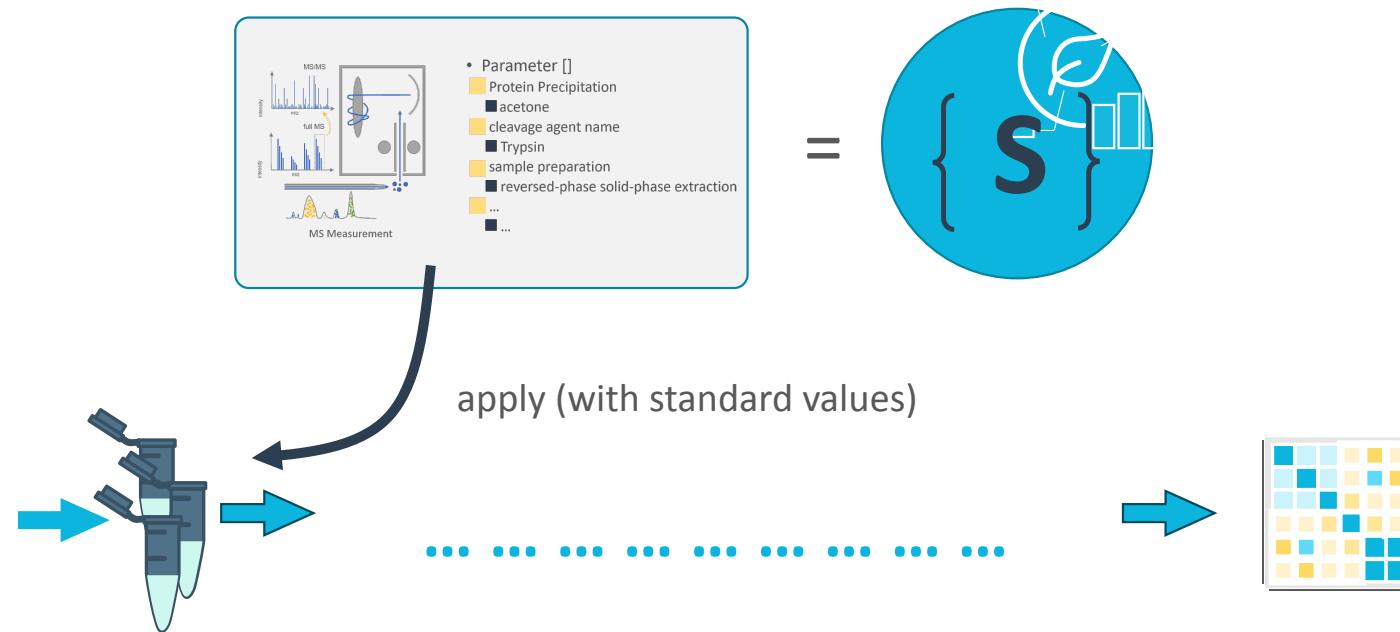
- █ Protein Precipitation
  - █ acetone
- █ cleavage agent name
  - █ Trypsin
- █ sample preparation
  - █ reversed-phase solid-phase extraction
- ...

## Component []

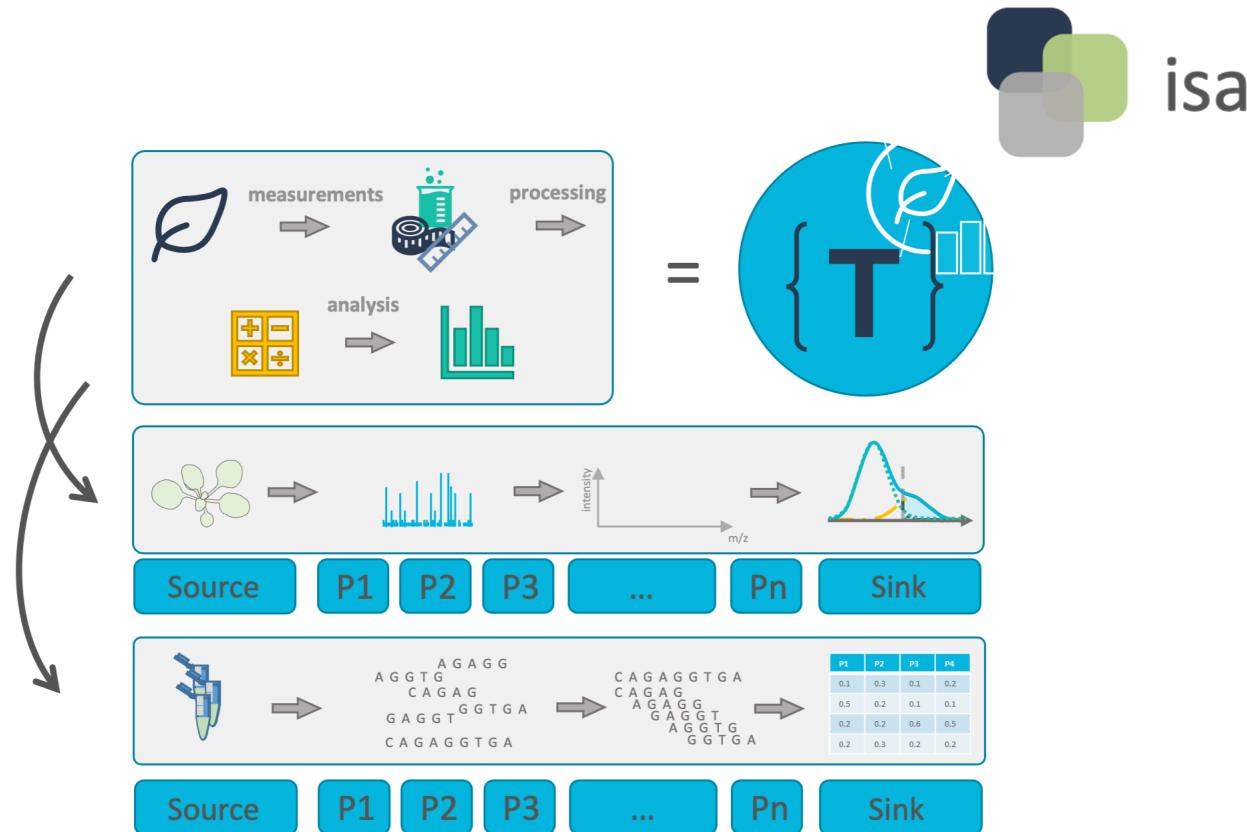
- █ chromatography instrument model
  - █ nanoElute2
- █ chromatography column model
  - █ PepSep C18 1.9 $\mu$ , 25cm x 75 $\mu$ m
- ...  
...



## Applying standard procedures to sample record



# Realization of lab-specific metadata with templates



Facilities can define their most common workflows as templates

## Hands-on part 2: ARCitect (and Swate)

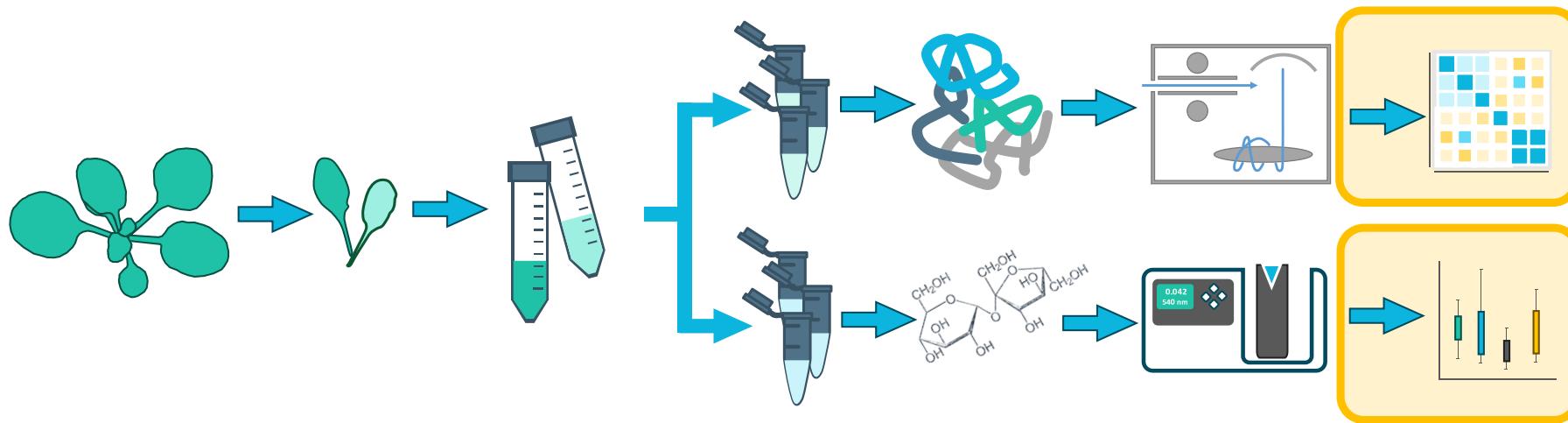
Continue the [Start Here](#) guide in the DataPLANT knowledge base.



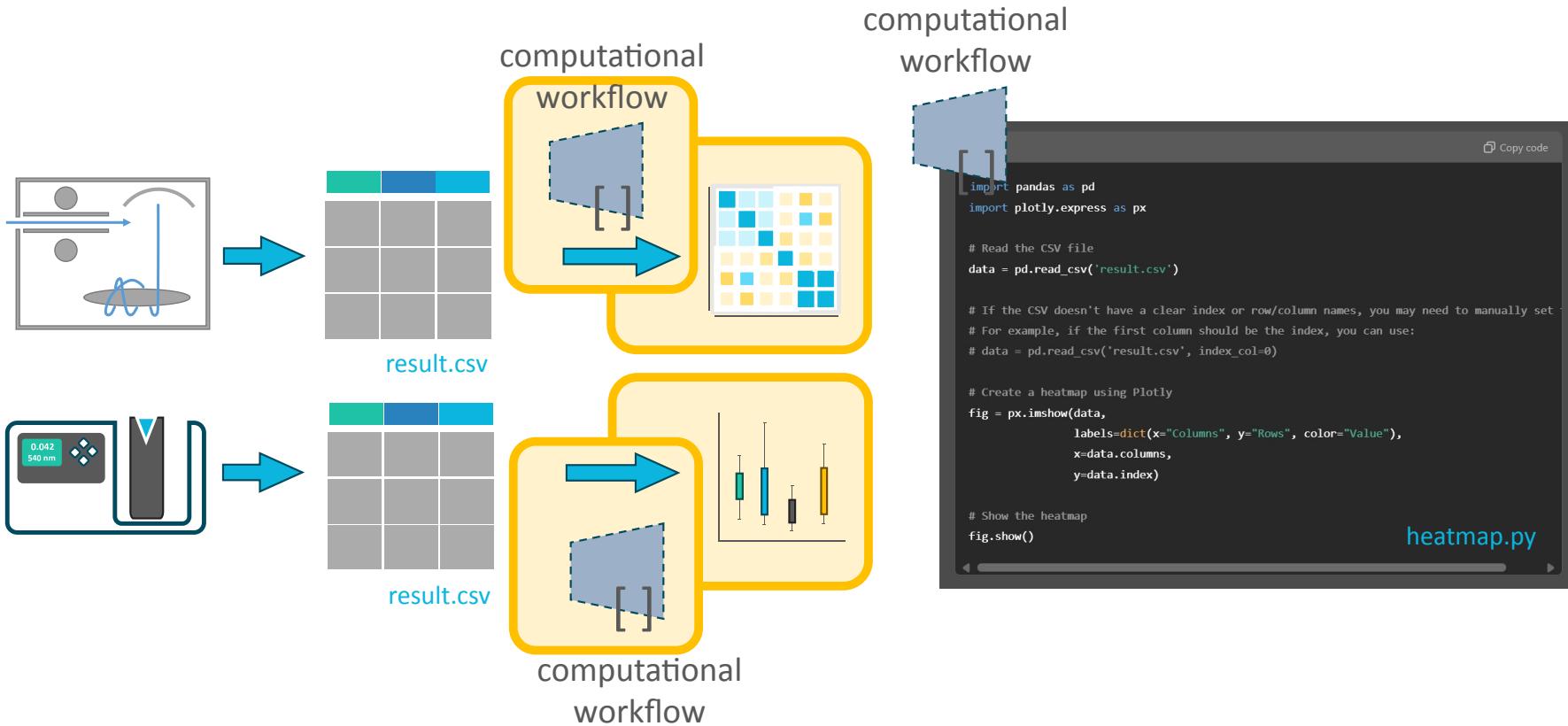
Until step **Add assay data**

# Hands-on part 3: Data

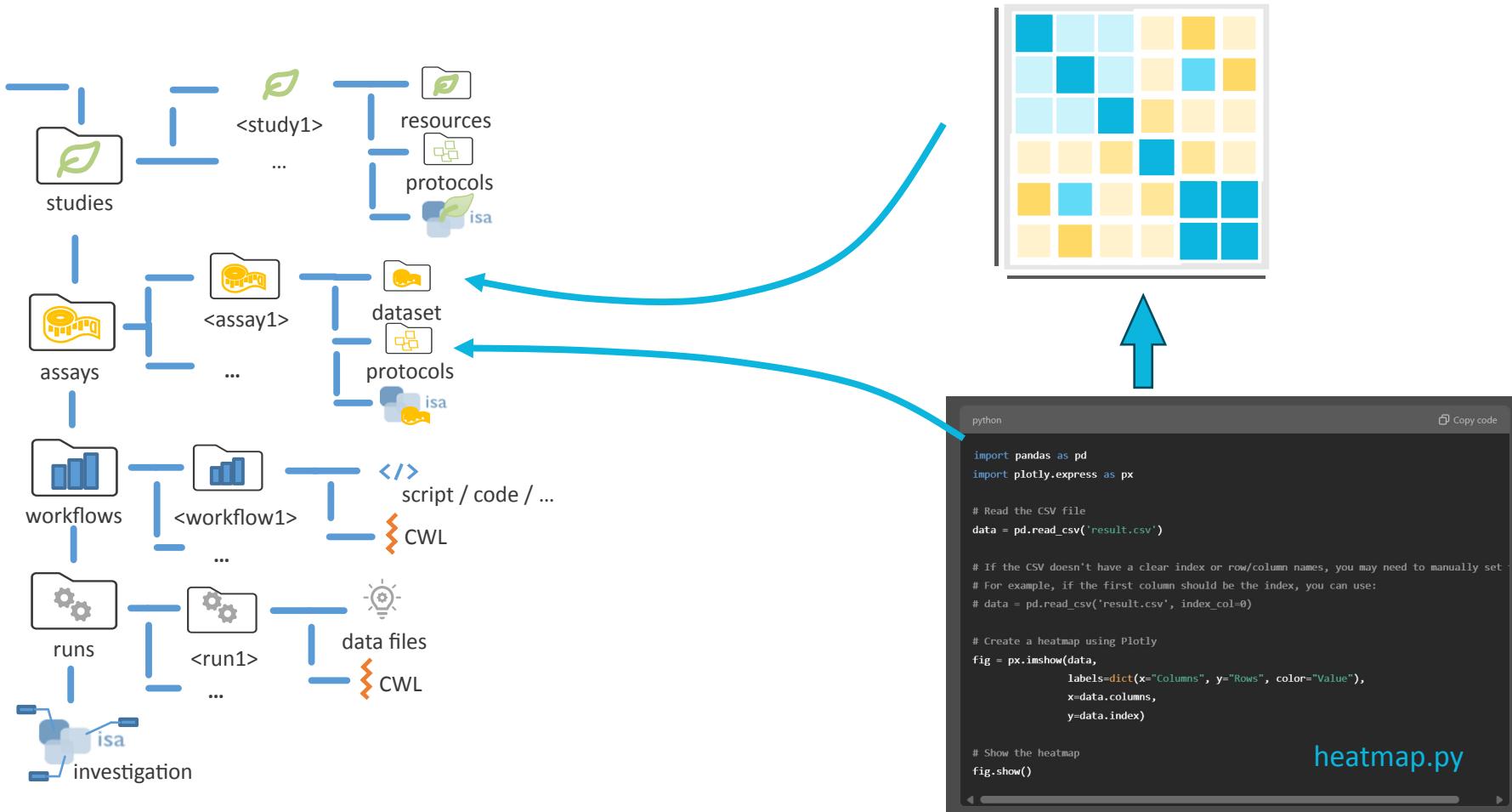
## Options to annotate the data analysis



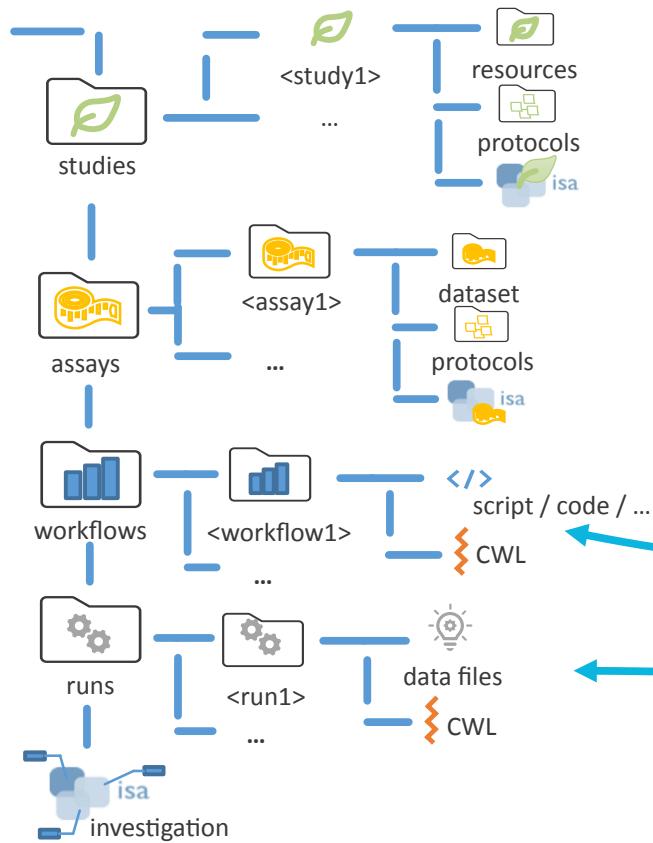
# A computational workflow is like a protocol



# Option I: Create a virtual assay



# Option II: Create a workflow and run



A screenshot of a code editor window titled "heatmap.py" containing the following Python script:

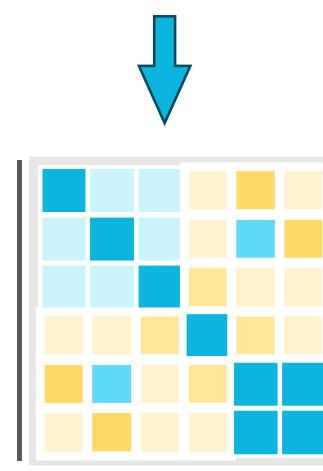
```
python
import pandas as pd
import plotly.express as px

# Read the CSV file
data = pd.read_csv('result.csv')

# If the CSV doesn't have a clear index or row/column names, you may need to manually set -
# For example, if the first column should be the index, you can use:
# data = pd.read_csv('result.csv', index_col=0)

# Create a heatmap using Plotly
fig = px.imshow(data,
                 labels=dict(x="Columns", y="Rows", color="Value"),
                 x=data.columns,
                 y=data.index)

# Show the heatmap
fig.show()
```



# Use CWL to wrap your workflow

CWL workflow document (\*.cwl)

```
graph LR; A["CWL workflow document (*.cwl)"] --> B["CWL job parameter (*.yaml)"]; B --> C["CWL runner"]; C --> D["output folder"]
```

1 → 2 → 3

```
#!/usr/bin/env cwl-runner

cwlVersion: v1.0
class: Workflow
inputs:
  tarball: File
  name_of_file_to_extract: string

outputs:
  compiled_class:
    type: File
    outputSource: compile/classfile

steps:
  untar:
    run: tar-param.cwl
    in:
      tarfile: tarball
      extractfile: name_of_file_to_extract
      out: [extracted_file]

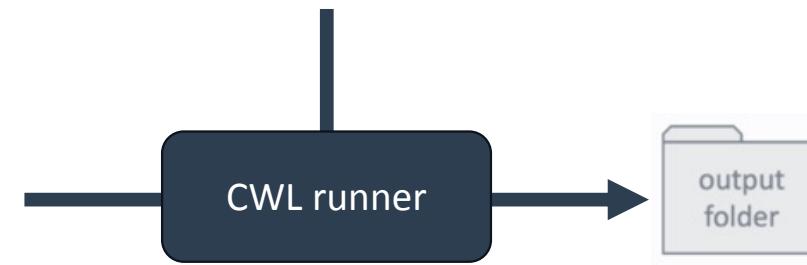
    compile:
      run: arguments.cwl
      in:
        src: untar/extracted_file
        out: [classfile]
```

CWL  
tool descriptors (\*.cwl)

CWL job parameter (\*.yaml)

```
job
yaml

file: fastq
param: 5
workflow: wf.cwl
output_folder:
  /temp
```



## Hands-on part 3: Data

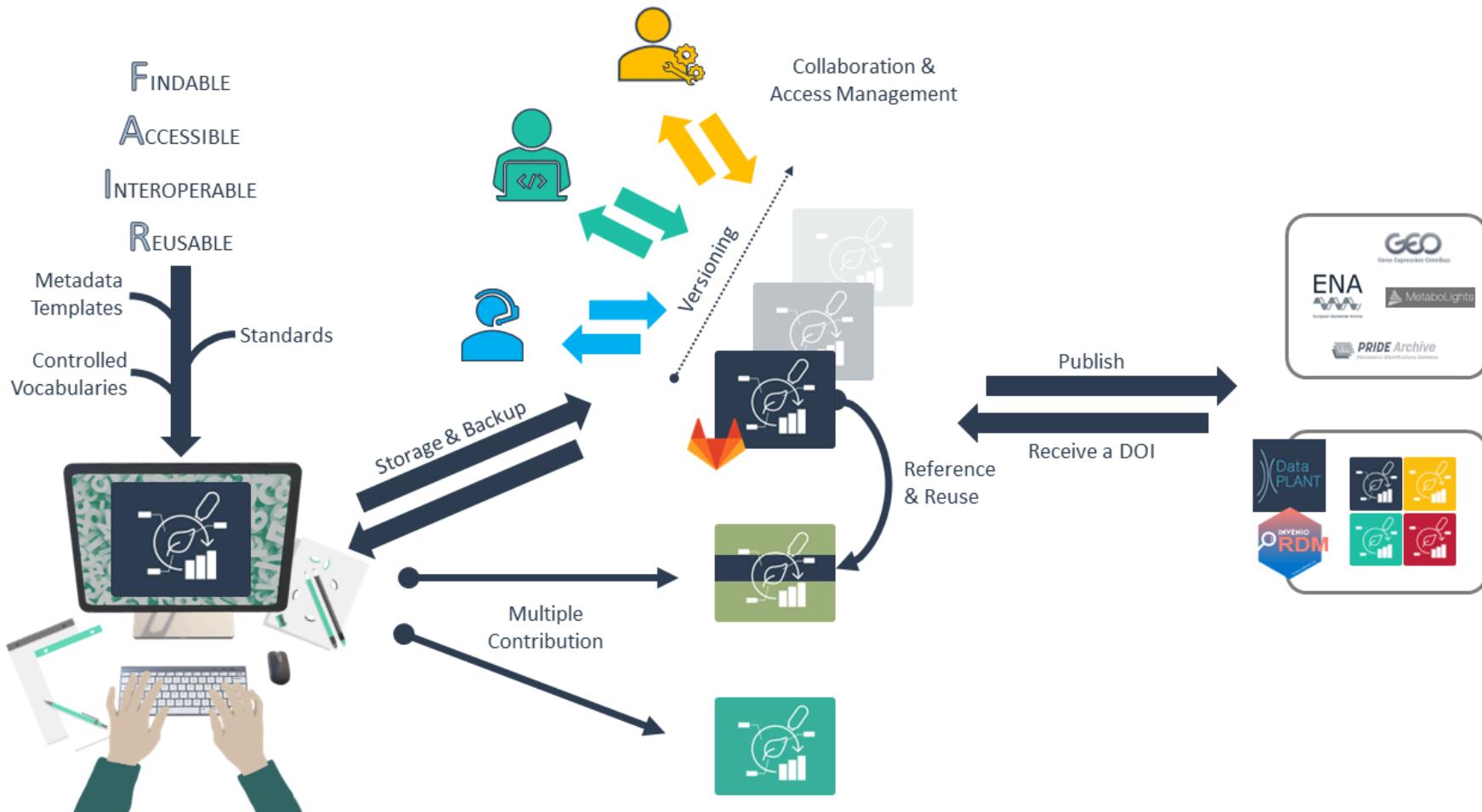
Continue the [Start Here](#) guide in the DataPLANT knowledge base.



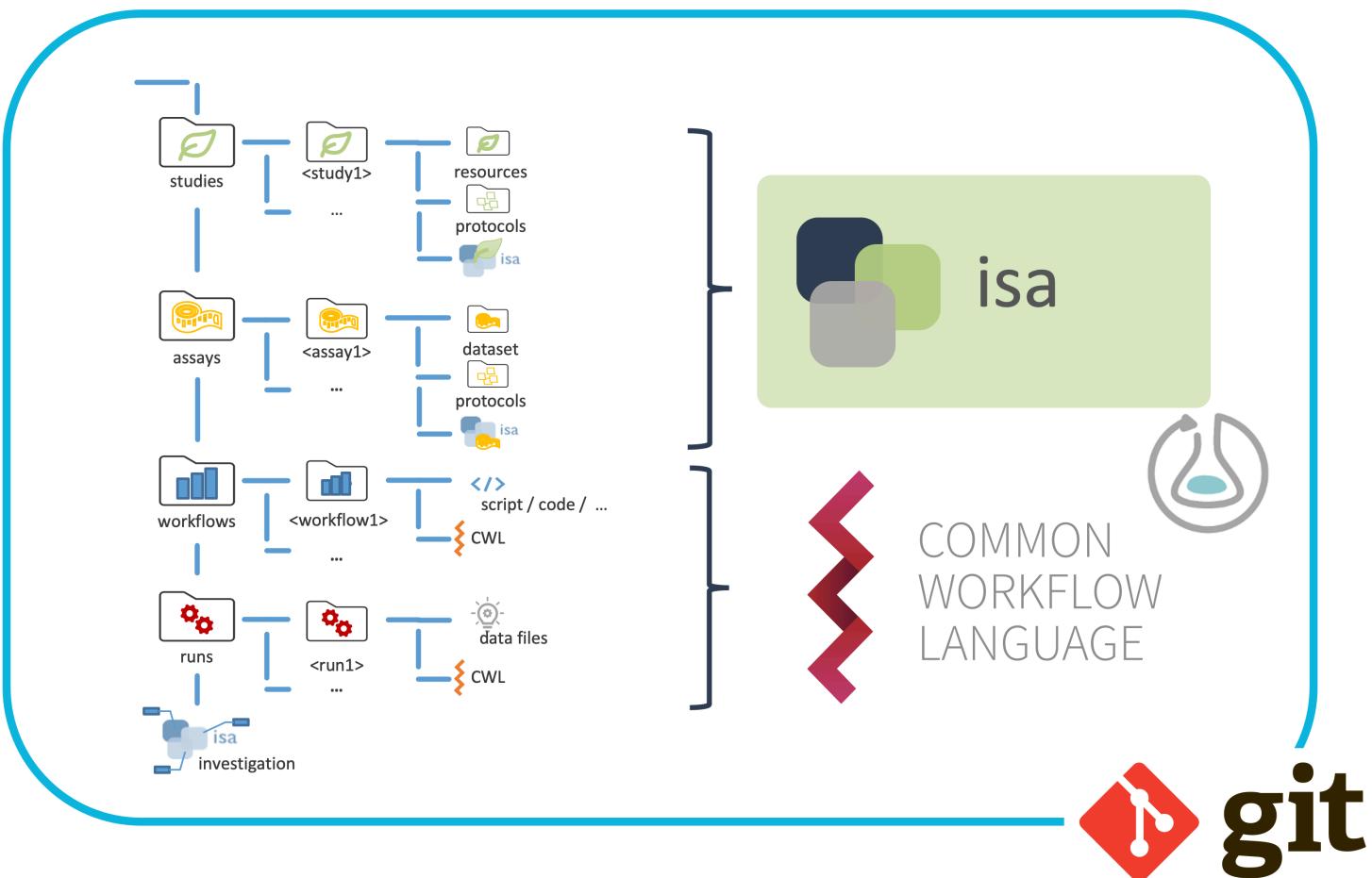
Until step **Data analysis**

# Hands-on part 4: DataHUB

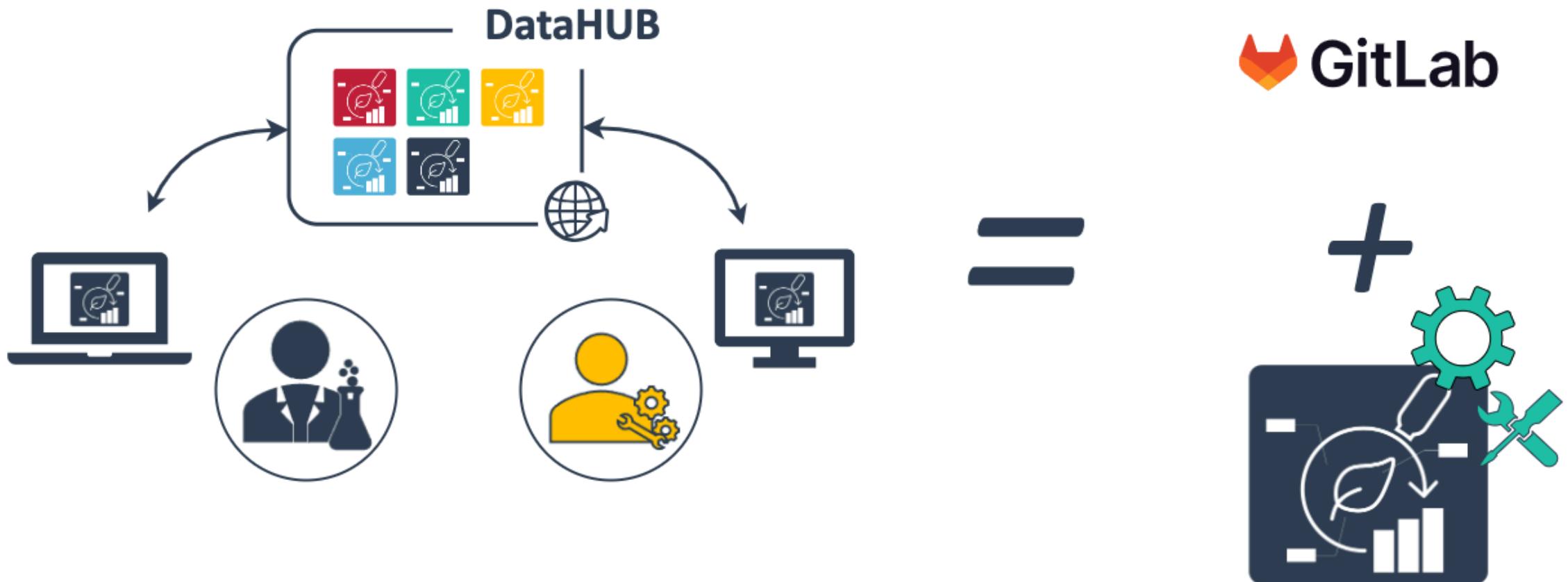
# DataHUB overview



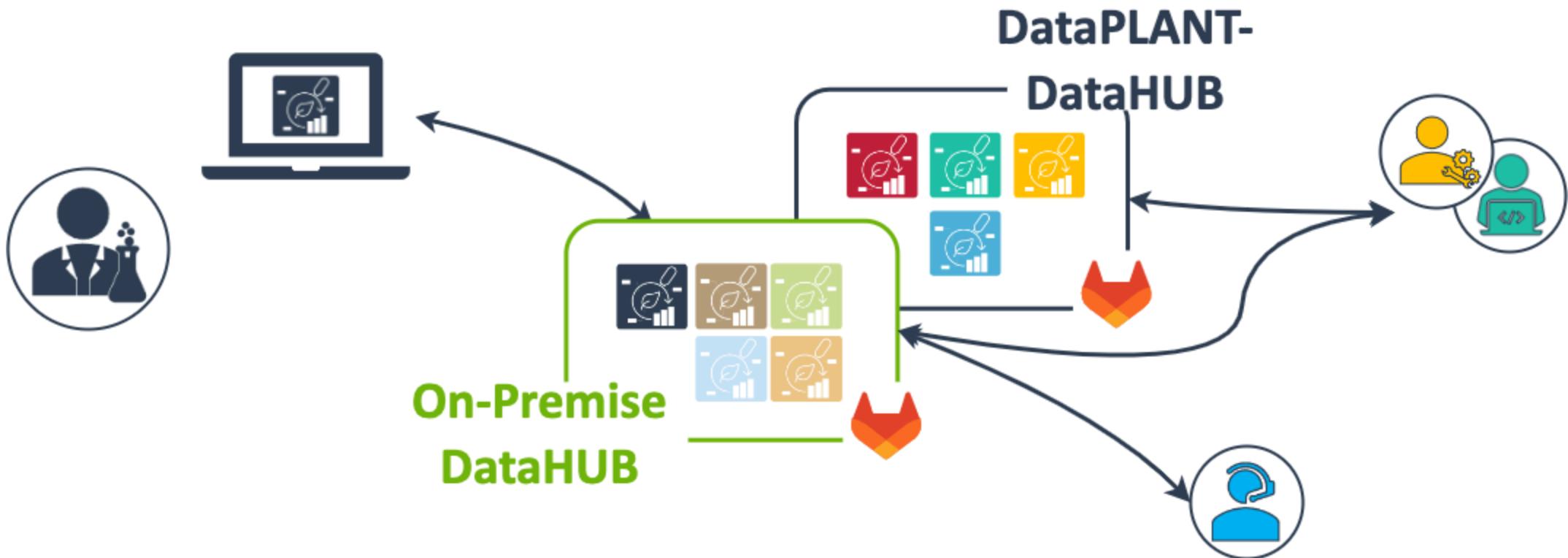
# ARC builds on standards + Git



# The DataPLANT DataHUB – a GitLab *Plus*

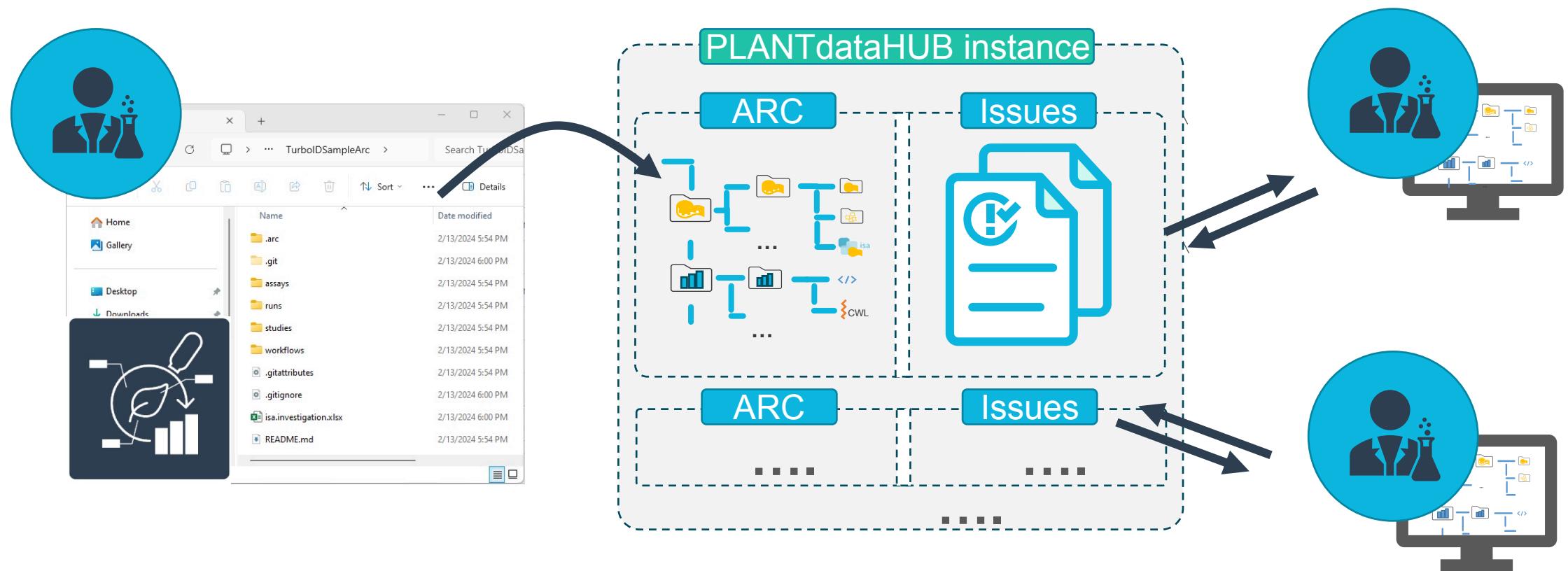


# On-premise DataHUBs

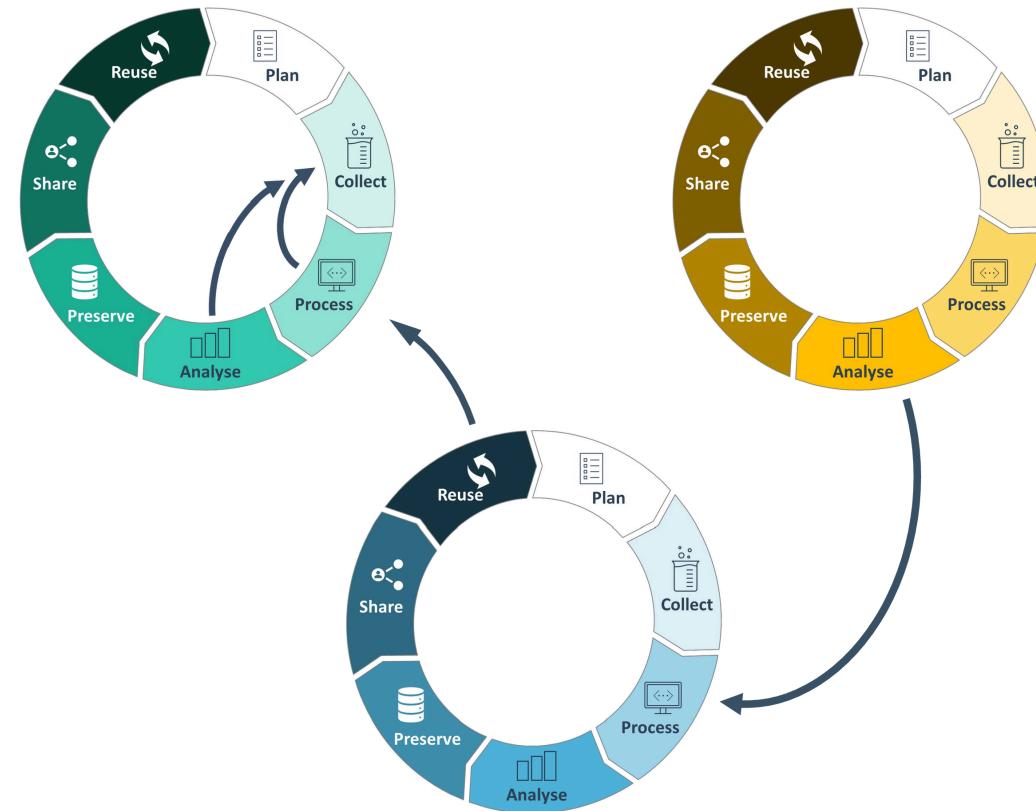


ARC services are available as on-premise option

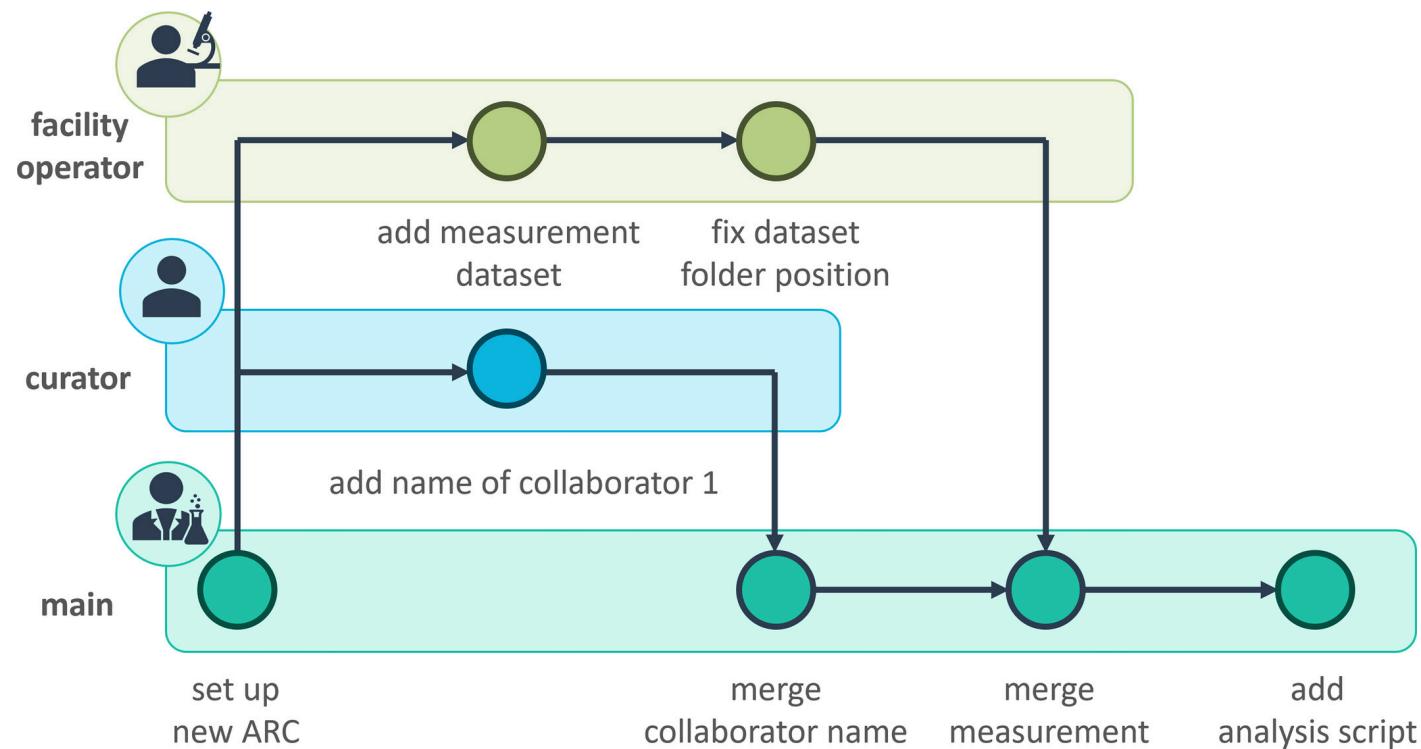
# Using the DataHUB to collaborate



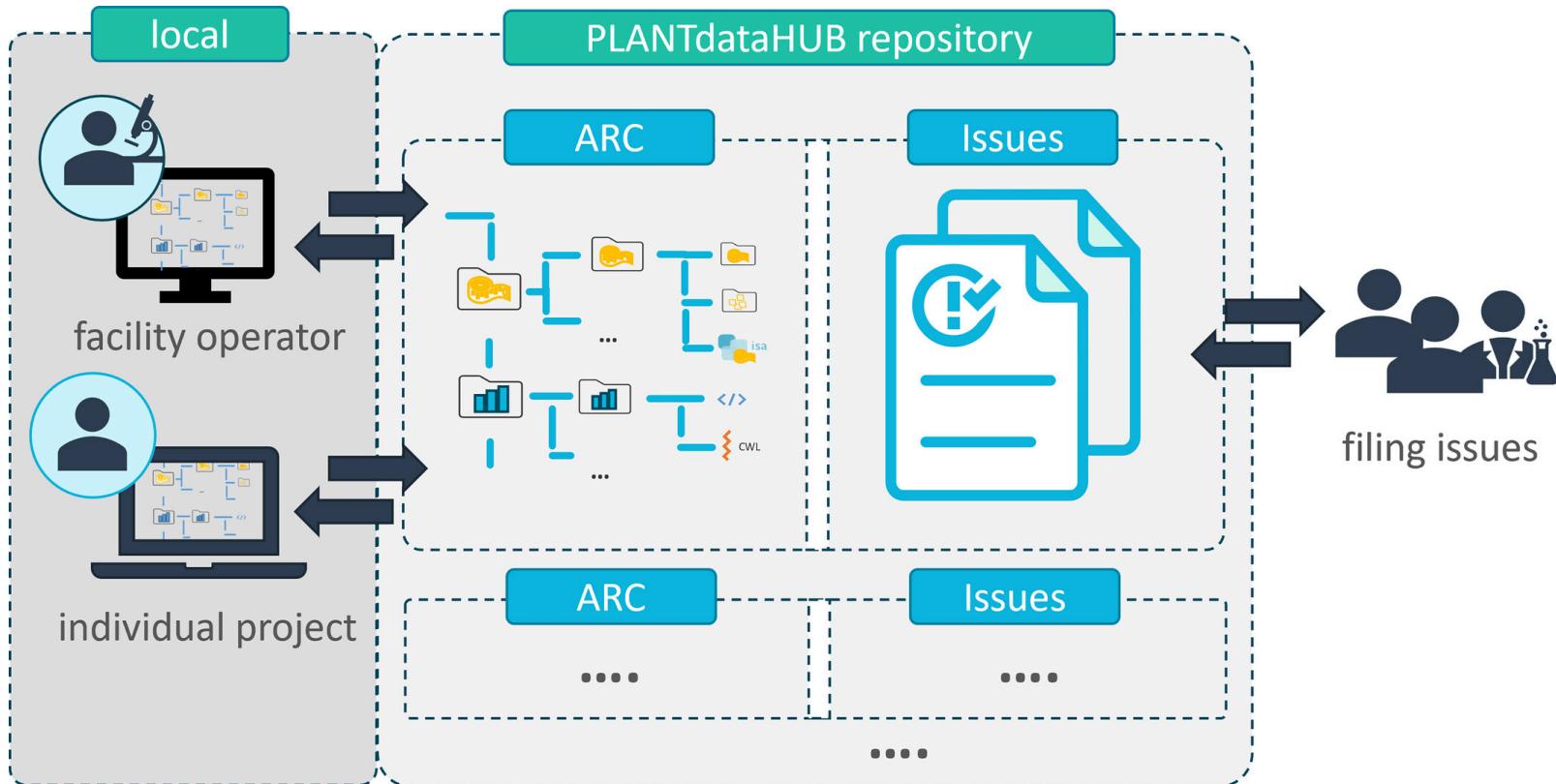
# The Research Data Lifecycle *is mutable*



# Mutable data life cycle



# Project management



# ARCs come with their own wiki space

- directly associated to your ARC
- same access rights as your ARC
- share meeting minutes or ideas with collaboration partners
- keep ARC clean of files that are not considered "research data"

The screenshot shows a DataHub interface for an ARC named 'Demo\_ARC'. The sidebar on the left contains links for Project (Demo\_ARC), Pinned, Manage, Plan, Issues (0), Issue boards, Milestones, Wiki (which is currently selected), Code, Build, Secure, and Help. The main content area has a header 'Home' and a message about CQC pipelines. It includes sections for 'Home' (last edited by Demo User just now), 'Meeting Schedule' (with a list of dates: 2024-06-12 Kick-off, 2024-06-27 Proposal discussion, 2024-07-04 Discuss RNA-seq pipeline), and 'Ideas and drafts' (Golden Gate protocol).

## Hands-on part 4: DataHUB

Continue the [Start Here](#) guide in the DataPLANT knowledge base.



Until the final **complete** step

# DataHUB terminology and data sharing

# Choosing the proper role

When inviting new members to an ARC or group, you can choose between different levels.

## Permissions & Roles

Roles are assigned when adding a user to an ARC or to a group. This is a very simplified summary.

**Guest** – Can only see the ARC's wiki

**Reporter** – Can read, but not add or edit data

**Developer** – Reporter permissions + can read, add, and edit data

**Maintainer** – Developer permissions + can add new members

**Owner** – Maintainer + can delete ARC, manage memberships and permissions

 By default you are **Owner** of an ARC you create or upload to the DataHUB.

## Projects and Groups are not the same

- "Project" = ARC
- "Groups" = Group of users

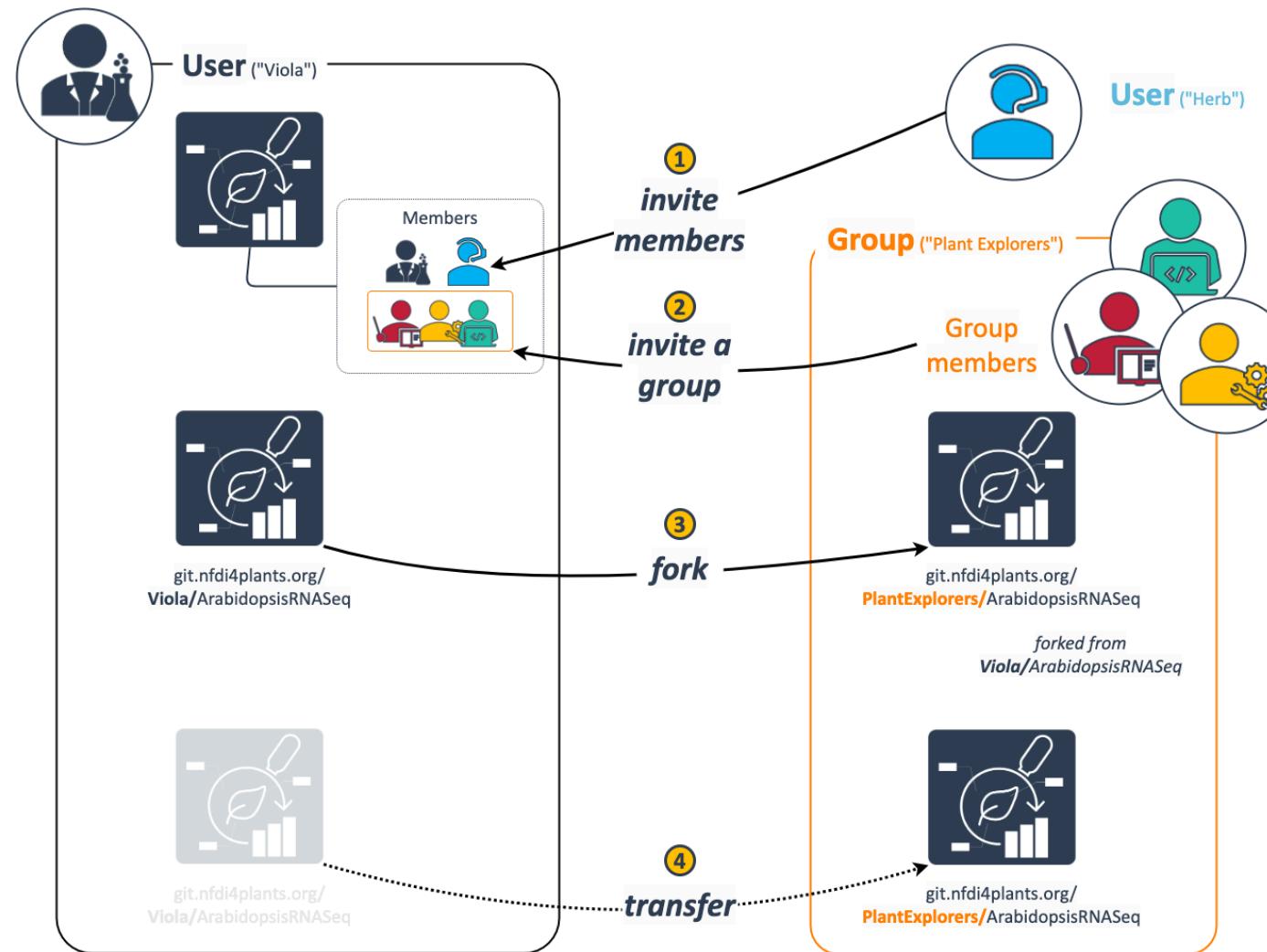
# Project = ARC

- In the DataHUB, ARCs are called "projects"; they are the same.
- An ARC can be shared with individual users (invited as "members") or a group.

## DataHUB Groups = Group of members (e.g. lab)

- A "Group" is a group of users with specific permissions
- A group can share ARCs
- A group can be invited to an ARC
- Groups can have subgroups

# Options to share an ARC via the DataHUB



# Namespaces

- Every user has a personal namespace, where they can upload or create new ARCs
- Every group and subgroup has its own namespace

Type	URL	Namespace	Name
A personal ARC	<a href="https://git.nfdi4plants.org/brilator/Facultative-CAM-in-Talinum">https://git.nfdi4plants.org/brilator/Facultative-CAM-in-Talinum</a>	brilator	Dominik Brilhaus
An group-shared ARC	<a href="https://git.nfdi4plants.org/hhu-plant-biochemistry/Samuilov-2018-BOU-PSP">https://git.nfdi4plants.org/hhu-plant-biochemistry/Samuilov-2018-BOU-PSP</a>	hhu-plant-biochemistry	HHU Plant Biochemistry

 **Personal** is not the same as **private**

# Visibility

The visibility of ARCs and groups can be managed individually for each ARC or group

## Visibility

The visibility of each ARC can be managed in the settings of the ARC



**Private** – ARC access must be granted explicitly to each user or group.



**Internal** – ARC can be accessed by any logged in user.



**Public** – ARC can be accessed without authentication.



By default every ARC and every group is set to **private**.

# ARC DataHUB members // ARC Investigation contacts

The screenshot shows the 'Project members' section of the DataHUB interface. It lists four members:

Account	Source	Max role	Expiration	Activity
Adriano Nunes-Nesi @nunesnesi	HHU Plant Biochemistry by Sebastian Triesch	Maintainer	Expiration date	User created: Jul 05, 2023 Access granted: Jul 10, 2023 Last activity: Aug 09, 2023
Andreas Weber @andreas.weber	HHU Plant Biochemistry by Sebastian Triesch	Maintainer	Expiration date	User created: Mar 10, 2023 Access granted: Jul 31, 2023 Last activity: Sep 11, 2023
Dominik Brilhaus It's you @brilator	Direct member by Dominik Brilhaus	Owner	Expiration date	User created: Feb 21, 2022 Access granted: Dec 06, 2023 Last activity: Mar 26, 2024
Franziska Fichtner @franziska.fichtner	HHU Plant Biochemistry by Sebastian Triesch	Maintainer	Expiration date	User created: Aug 11, 2023 Access granted: Aug 11, 2023 Last activity: Aug 11, 2023

DataHUB: ARC members

[https://git.nfdi4plants.org/hhu-plant-biochemistry/Samuilov-2018-BOU-PSP/-/project\\_members](https://git.nfdi4plants.org/hhu-plant-biochemistry/Samuilov-2018-BOU-PSP/-/project_members)

The screenshot shows the 'Investigation Contacts' section of the ARCIctect interface. It lists ten contacts with their ORCID IDs and scores:

Contact	Score
Sladjana Samuilov <orcid>	4/10
Nadine Rademacher <orcid>	3/10
Samantha Flachbart <orcid>	3/10
Leila Arab <orcid>	3/10
Saleh Alfarraj <orcid>	3/10
Franziska Kuhnert <orcid>	3/10
Stanislav Kopriva <orcid>	3/10
Andreas P. M. Weber <orcid>	4/10
Tabea Mettler-Altmann <orcid>	3/10

ARCIctect: Investigation Contacts

Investigation contacts are not automatically invited as members to the ARC.

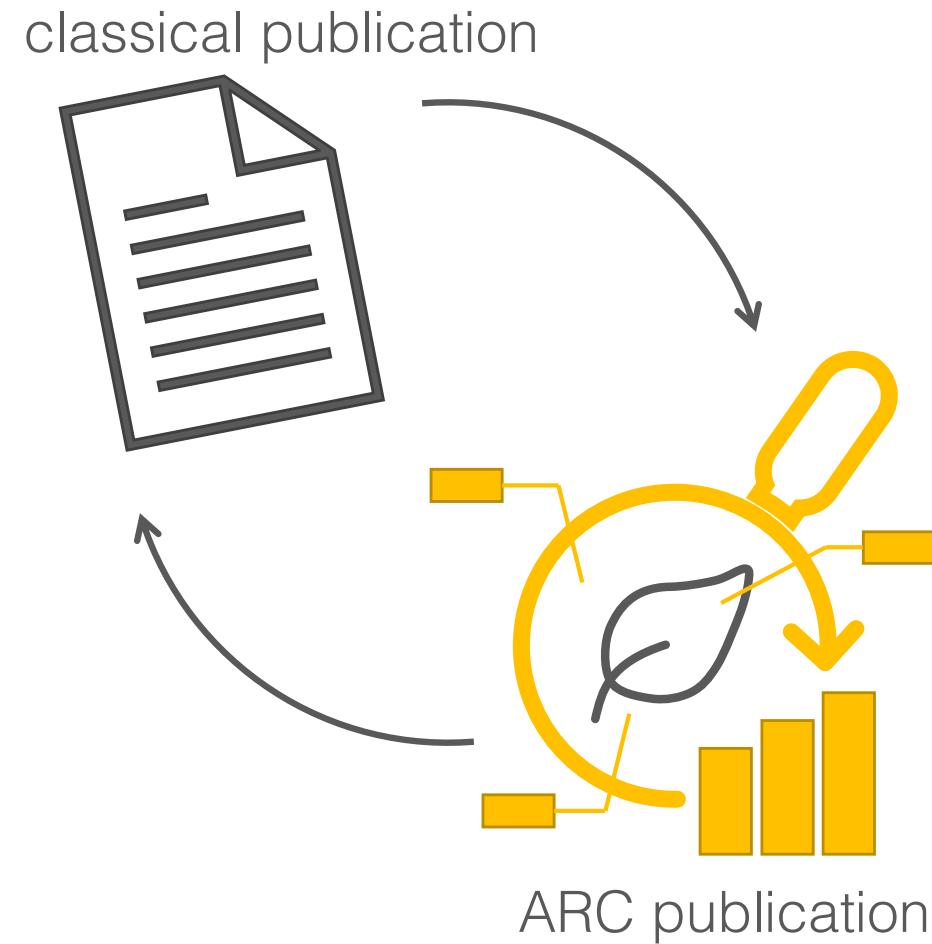
# Version control

Check out the **commit history** of your ARC via Repository (2) or directly via commits (7)

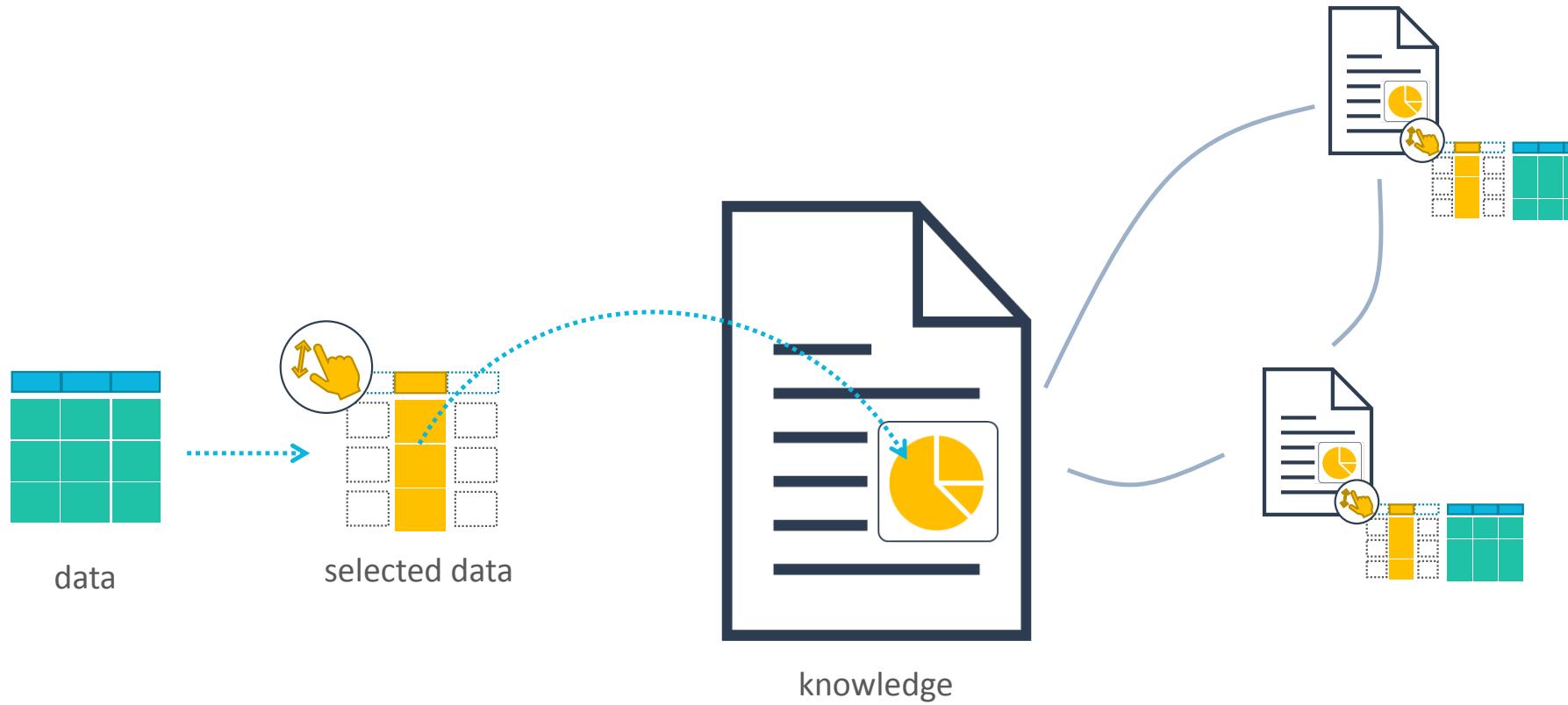
The screenshot shows the 'Demo User / Demo\_ARC' project interface. On the left, a sidebar lists project management options: Manage (1), Plan (2), Code (3), Build, Secure, Deploy, Operate, Monitor, Analyze, Settings (4), and Help. The main area displays the 'Demo\_ARC' repository (5). The repository header includes a search bar, file counts (13 files, 11 tests, 12 issues), and a 'Search or go to...' input field. The repository name 'Demo\_ARC' is shown with a lock icon and a commit count (7) in a yellow circle (7). Below the header is a navigation bar with 'main' branch, a '+' button, and tabs for History, Find file, Edit, and Code (selected). A commit list shows the first commit: 'arc init' by Demo User, 4 minutes ago, with a green checkmark and commit ID 7a8c9714. A table below lists project files: assays, runs, studies, workflows, .gitignore, and isa.investigation.xlsx, all last committed 4 minutes ago. To the right, the 'Project information' section shows a pipeline status (passed), a 'Publish ARC' button, and metrics: 1 Commit, 2 Branches, 0 Tags, 7 KiB Project Storage. It also lists Auto DevOps enabled and various integration options like Add README, LICENSE, CHANGELOG, CONTRIBUTING, Kubernetes cluster, Wiki, and Configure Integrations. The bottom right shows the project was created on July 13, 2024.

Name	Last commit	Last update
assays	arc init	4 minutes ago
runs	arc init	4 minutes ago
studies	arc init	4 minutes ago
workflows	arc init	4 minutes ago
.gitignore	arc init	4 minutes ago
isa.investigation.xlsx	arc init	4 minutes ago

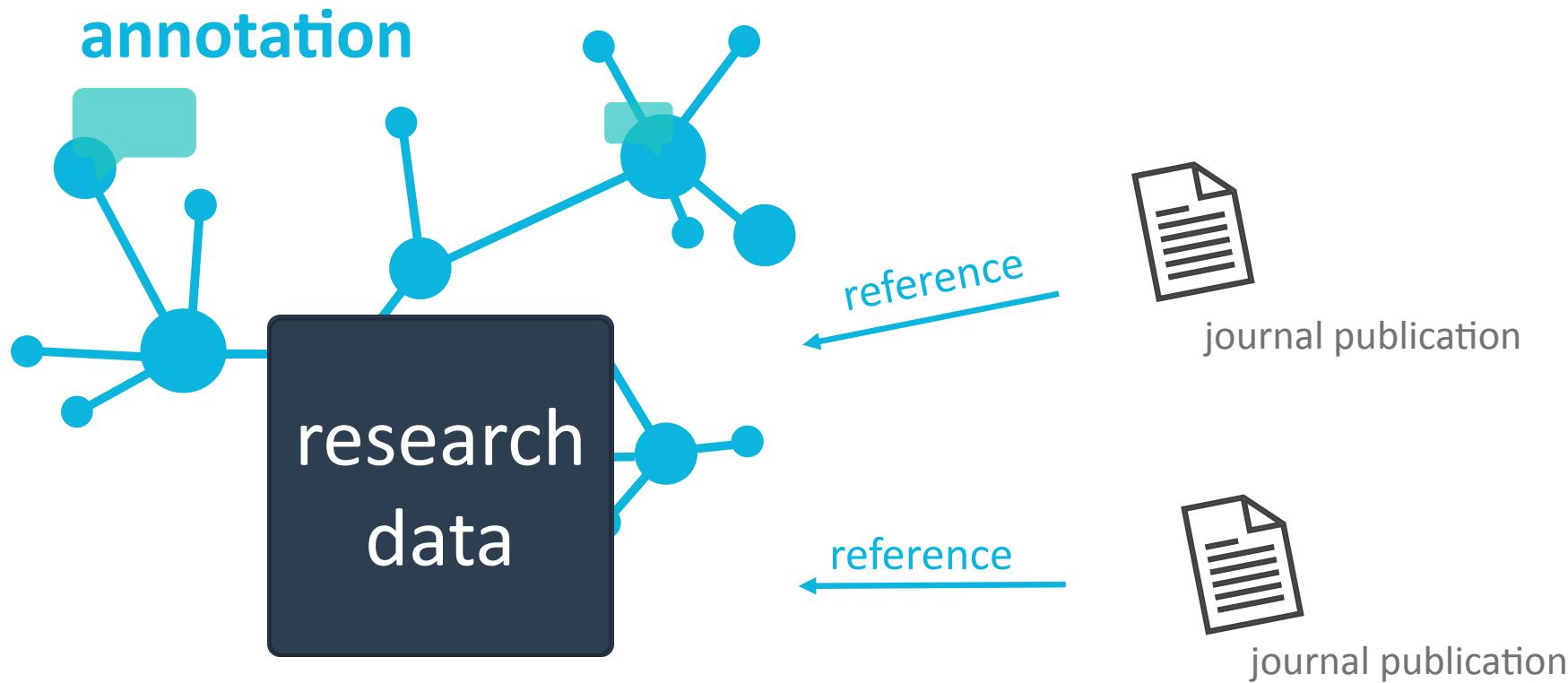
# Hands-on part 5: ARC data publication



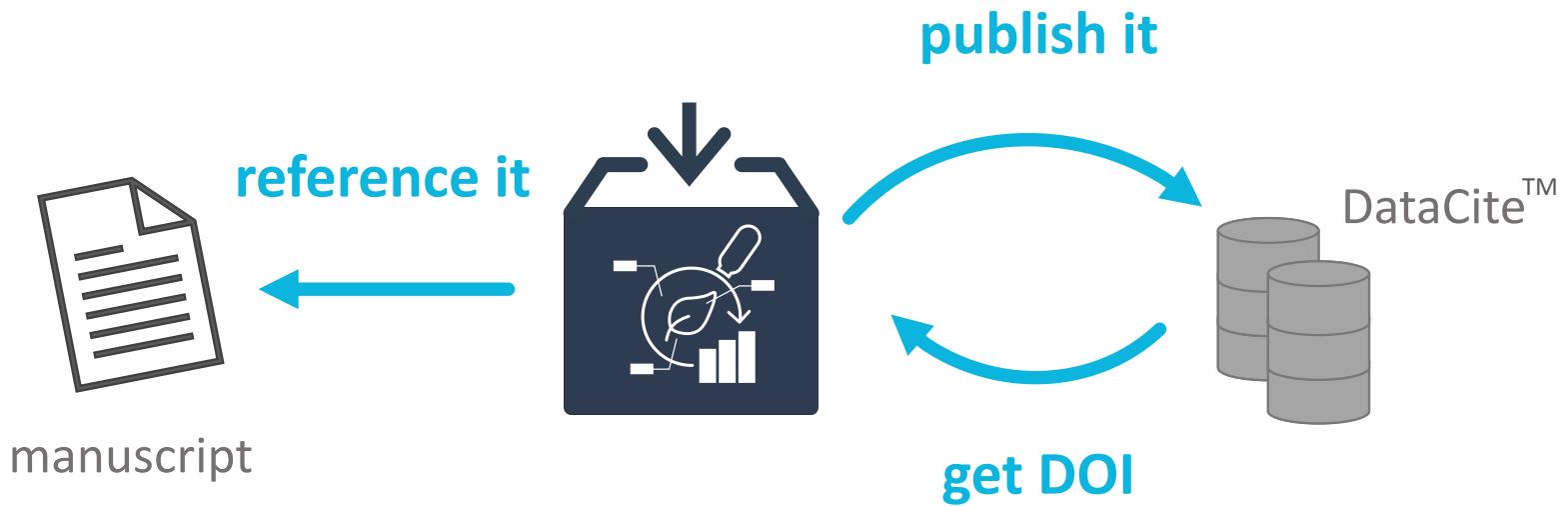
# Moving from paper to FAIR data publication



# Moving from paper to data publications



# Publish your ARC, get a DOI



# Publish your ARC with a few clicks

The screenshot shows a bioRxiv project page for 'Ru\_ChlamyHeatstress'. The project icon features a green cell with a鞭毛 (flagella) and a red thermometer icon. The project title is 'Ru\_ChlamyHeatstress' with a globe icon. Below it, 'Project ID: 122' and a copy icon are shown. To the right, there's a 'Star' button with '1' star. Key statistics are listed: 53 Commits, 1 Branch, 0 Tags, and 293.9 GB Project Storage. Topics include Chlamydomonas, abiotic stress, proteomics, and more. A descriptive text states: 'Algae cultures were grown mixotrophically (TAP). After 24h of 35°C/40°C the cells were shifted back to room temperature for 48h. 'omics samples were taken.' At the bottom, three numbered circles (1, 2, 3) point to buttons: 1 points to a 'pipeline' status bar (green 'passed'), 2 points to a 'Publish ARC' button with a heart icon, and 3 points to an 'arc quality' bar (yellow '301/301').

Ru\_ChlamyHeatstress

Project ID: 122

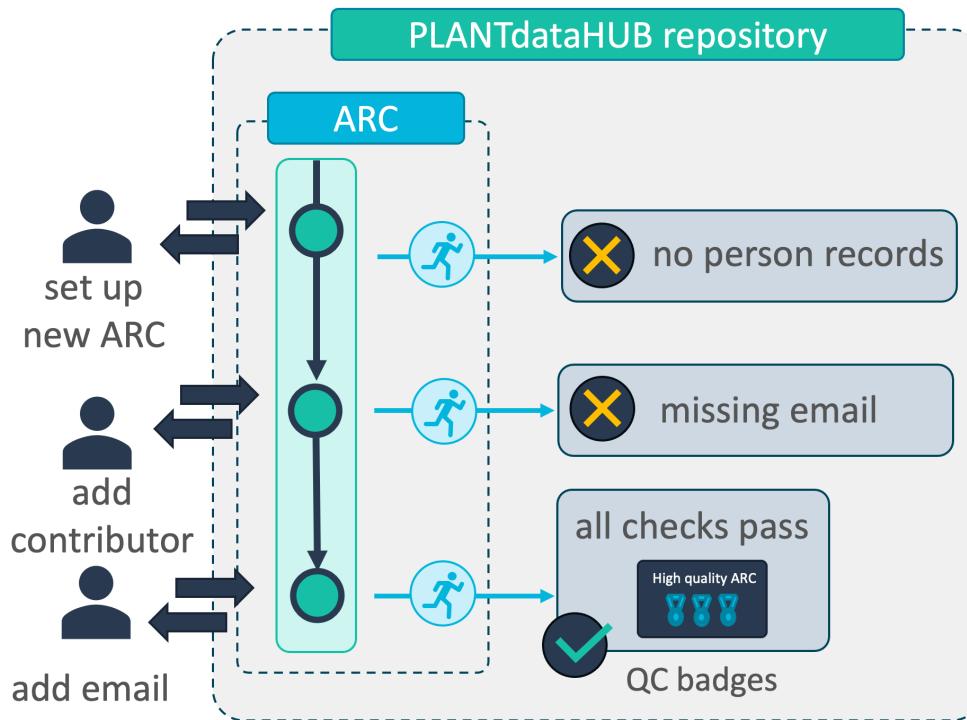
53 Commits 1 Branch 0 Tags 293.9 GB Project Storage

Topics: Chlamydomonas, abiotic stress, proteomics, + 1 more

Algae cultures were grown mixotrophically (TAP). After 24h of 35°C/40°C the cells were shifted back to room temperature for 48h. 'omics samples were taken.

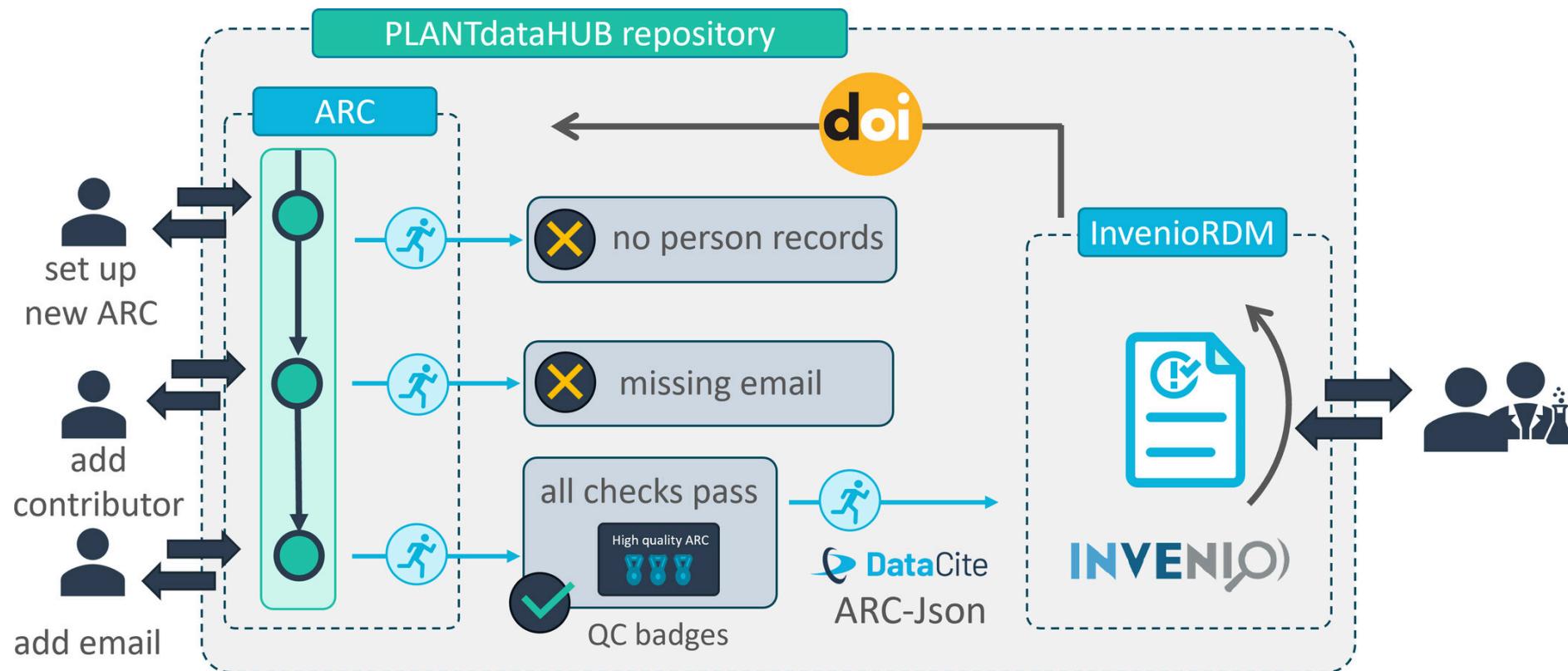
1 pipeline passed 2 Publish ARC 3 arc quality 301/301

# Validation



adapted from Weil, H.L., Schneider, K., et al. (2023), PLANTdataHUB: a collaborative platform for continuous FAIR data sharing in plant research. Plant J. <https://doi.org/10.1111/tpj.16474>

# Validate & publish



# Validation towards publication

# Receive a DOI

Published September 7, 2023 | Version v1

Dataset  Open

## Systems-wide investigation of responses to moderate and acute high temperatures in the green alga *Chlamydomonas reinhardtii*.

Zhang, Ningning<sup>1</sup>; Mattoon, Erin<sup>1</sup>; McHargue, Will<sup>1</sup> ; Venn, Benedict<sup>2</sup> ; Zimmer, David<sup>2</sup> ; Pecani, Kresti<sup>3</sup>; Jeong, Jooyeon<sup>1</sup>; Anderson, Cheyenne<sup>1</sup>; Chen, Chen<sup>4</sup>; Berry, Jeffrey<sup>1</sup>; Xia, Ming<sup>1</sup>; Tzeng, Shin-Cheng<sup>1</sup> ; Becker, Eric<sup>1</sup>; Pazouki, Leila<sup>1</sup>; Evans, Bradley<sup>1</sup>; Cross, Fred<sup>3</sup>; Cheng, Jianlin<sup>4</sup>; Czymmek, Kirk<sup>1</sup> ; Schröda, Michael<sup>5</sup> ; Mühlhaus, Timo<sup>2</sup> ; Zhang, Ru<sup>1</sup> 

Show affiliations

Style APA 

1

### Citation

Zhang, N., Mattoon, E., McHargue, W., Venn, B., Zimmer, D., Pecani, K., Jeong, J., Anderson, C., Chen, C., Berry, J., Xia, M., Tzeng, S.-C., Becker, E., Pazouki, L., Evans, B., Cross, F., Cheng, J., Czymmek, K., Schröda, M., ... Zhang, R. (2023). Systems-wide investigation of responses to moderate and acute high temperatures in the green alga *Chlamydomonas reinhardtii*. [Data set]. DataPLANT. <https://doi.org/10.60534/9e5jx-75d83>

2

### Details

#### DOI

DOI [10.60534/9e5jx-75d83](https://doi.org/10.60534/9e5jx-75d83)

#### Resource type

Dataset

#### Publisher

DataPLANT

#### Export

JSON

Export

### Description

hosted on: <https://git.nfdl4plants.org/projects/122>

### Files

arc-summary.md

[Data set] Systems-wide investigation of responses to moderate and acute high temperatures in the green alga *Chlamydomonas reinhardtii*.

#### File contents:

- root
  - isa.investigation.xlsx
  - README.md
  - runs

# Hands-on part 5: Data publication

1. ARC validation
2. (Towards) ARC publication

# Q&A and Wrap-up

# DataPLANT Resources – join the open source movement

DataPLANT Website: <https://nfdi4plants.org/>

Knowledge Base: <https://nfdi4plants.org/nfdi4plants.knowledgebase/>

DataHUB: <https://git.nfdi4plants.org>

GitHub: <https://github.com/nfdi4plants>

HelpDesk: <https://helpdesk.nfdi4plants.org>

 You can help us by raising issues, bugs, ideas...

 NEW! ARC website: <https://arc-rdm.org>

# Continuous support

Data managers in Düsseldorf, Cologne, Jülich and close by (CEPLAS, MibiNet, TRR341) offer support.

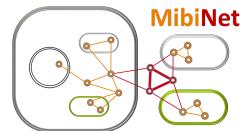
1. Slack Workspace for ad hoc support
2. Monthly user meeting (2nd Friday of the month)

→ [Details](#).



trr\_341

plant  
ecological  
genetics



# Five-Finger-Feedback



# Contributors

If not referenced otherwise, figures and slides presented here were created by members of DataPLANT (<https://nfdi4plants.org>).

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orcid: <https://orcid.org/0009-0000-4569-6126>

