RPTU Rheinland-Pfälzische Technische Universität Kaiserslautern Landau

TRR 175

Research-driven cultivation of contextualized data for plant biology

Project INF

David Zimmer

CSB COMPUTATIONAL SYSTEMS BIOLOGY

Rheinland-Pfälzische Technische Universität Kaiserslautern Landau

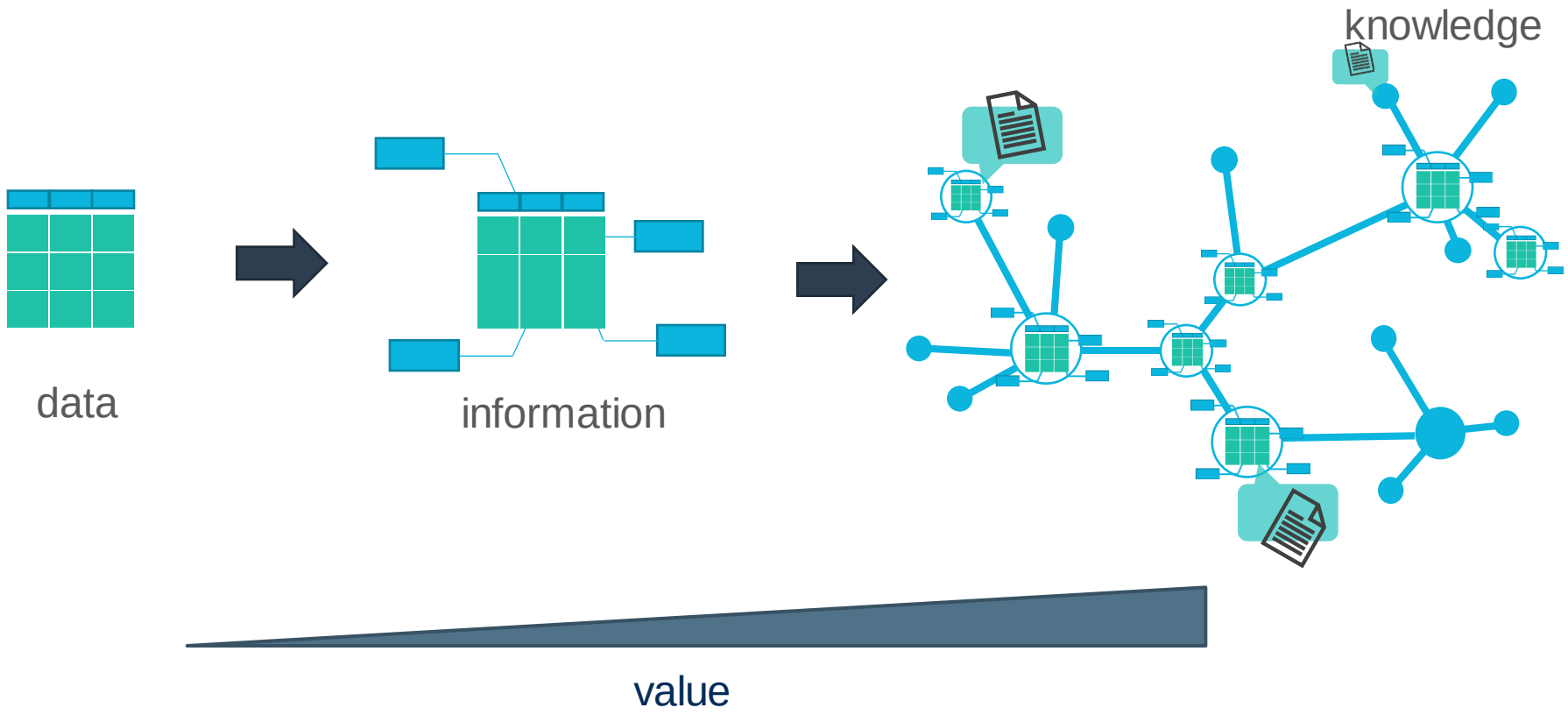
TRR 175

Motivation

David Zimmer

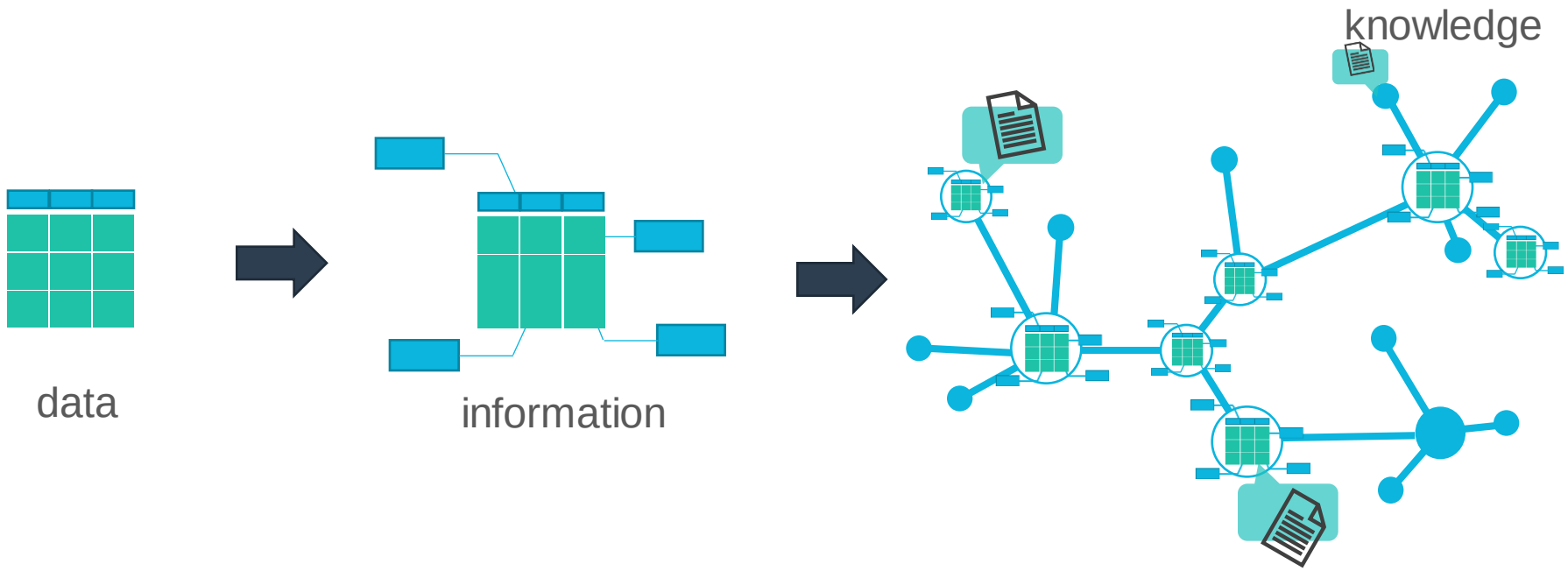
CSB
COMPUTATIONAL SYSTEMS BIOLOGY

Motivation



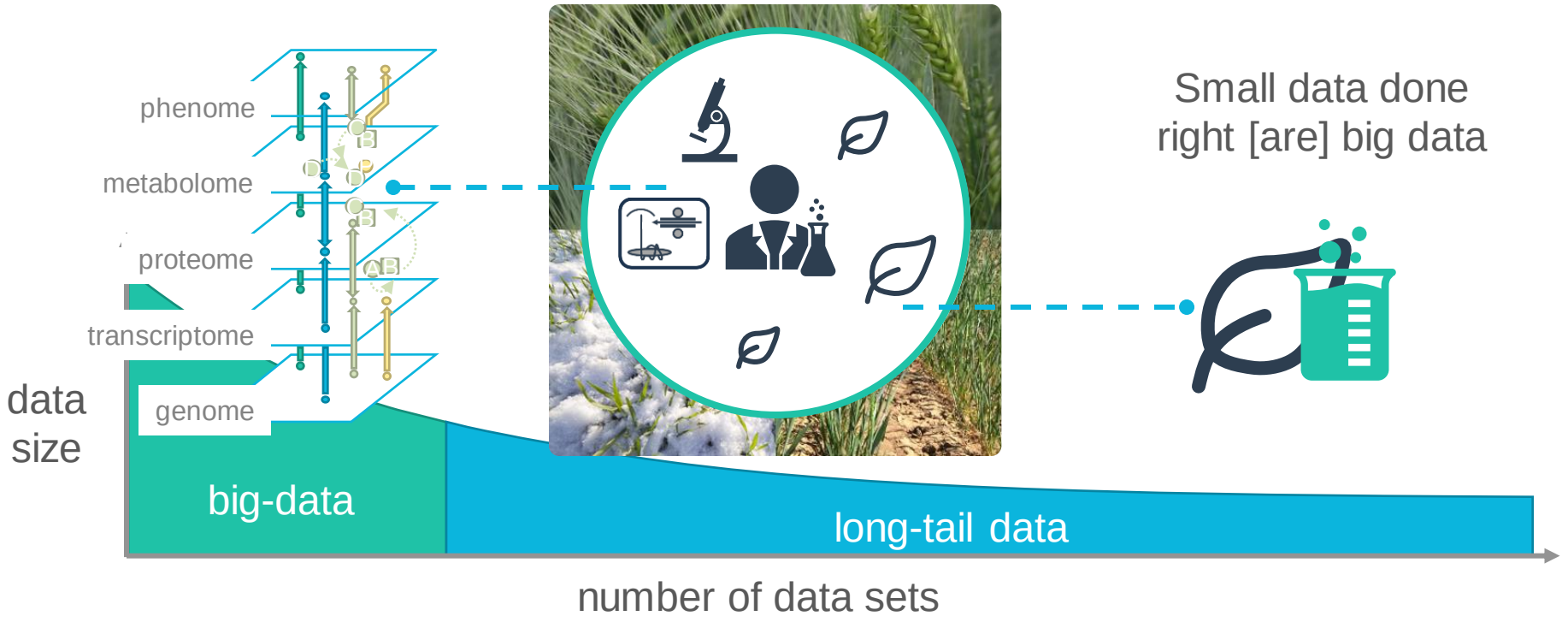
- Data: From primary product to first class citizen

Motivation



- Becoming FAIR will drive plant science

Motivation



- FAIR for everyone with plant research at center

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Objectives

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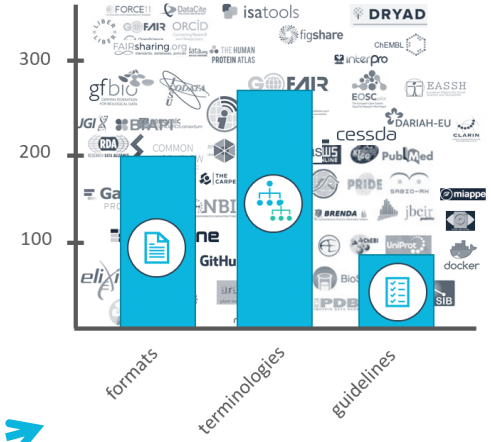
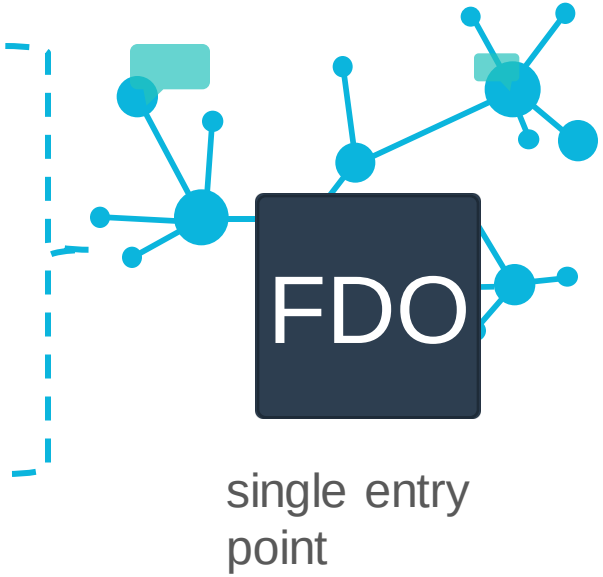
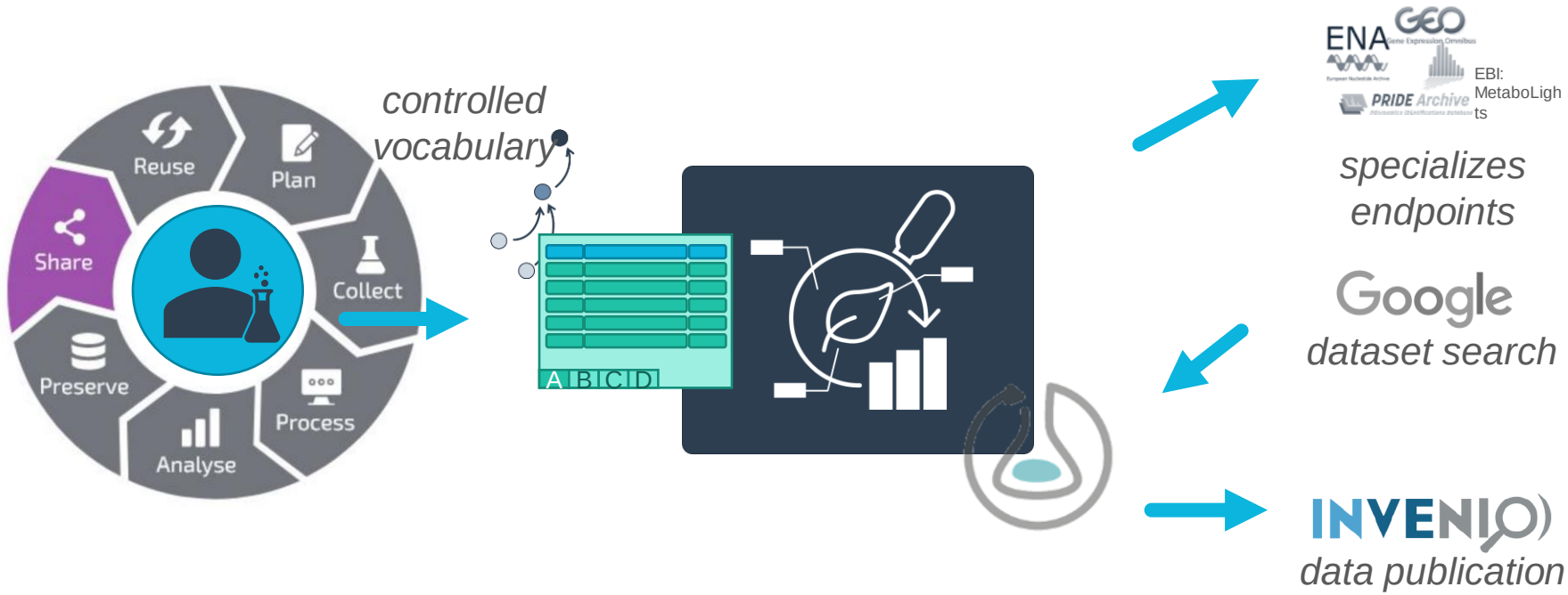
Objectives





- FAIR and easy: Simplifying RDM

Objectives



- FAIR and easy: Towards intuitive RDM

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State of the art

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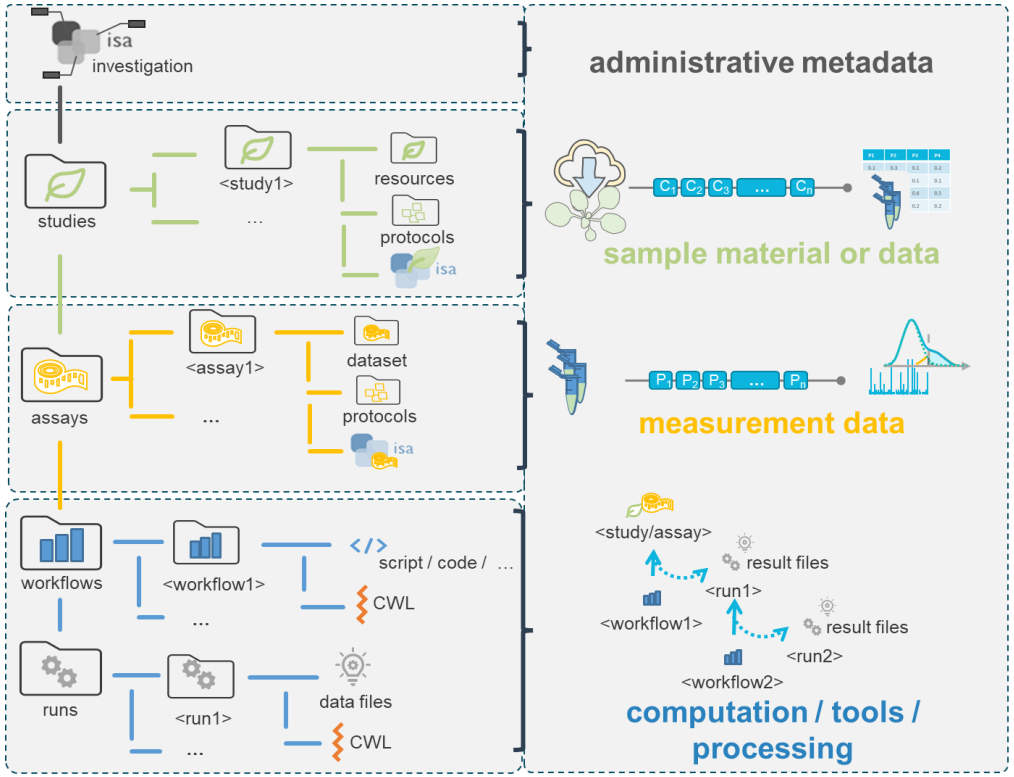
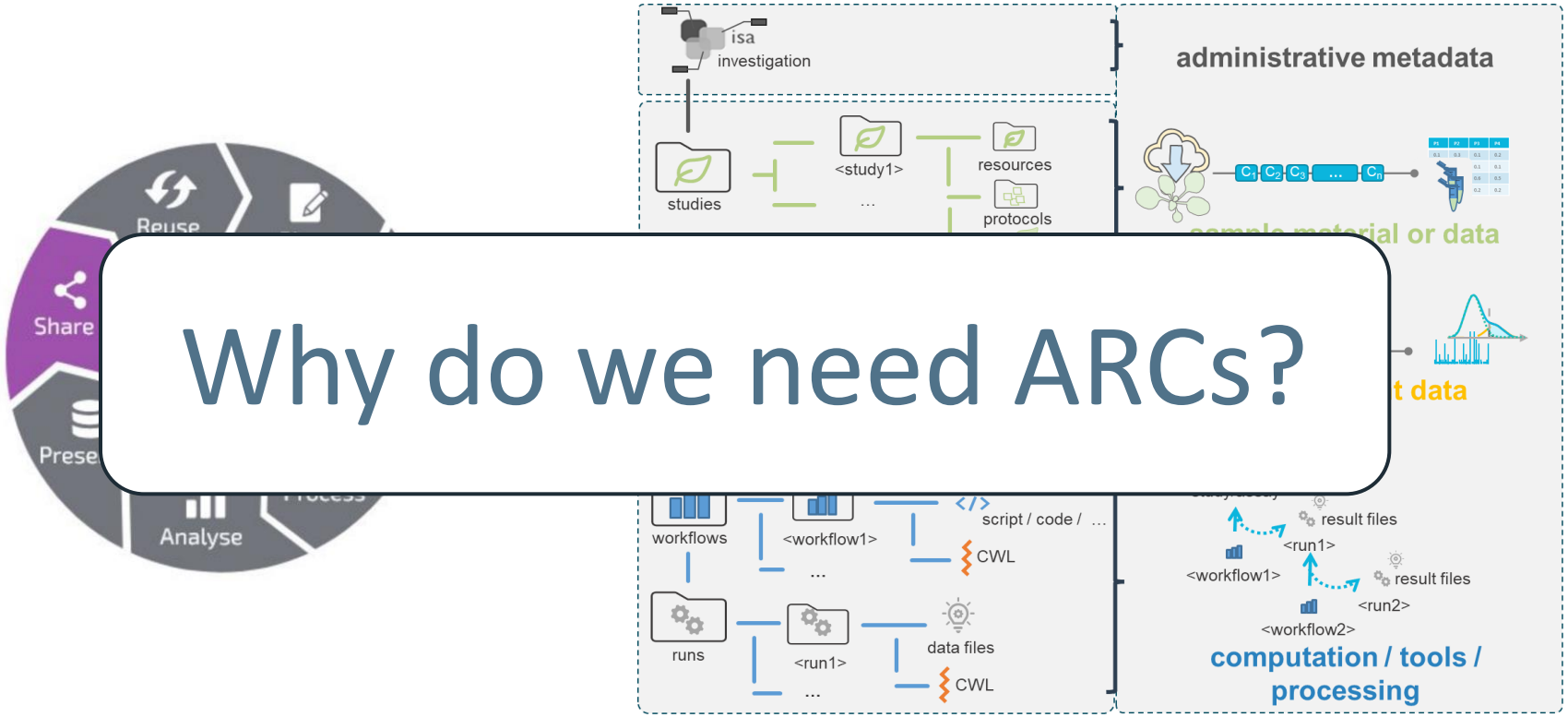
State of the art: ARC



- FAIR and easy: The Annotated Research Context

State of the art: ARC



- FAIR and easy: The Annotated Research Context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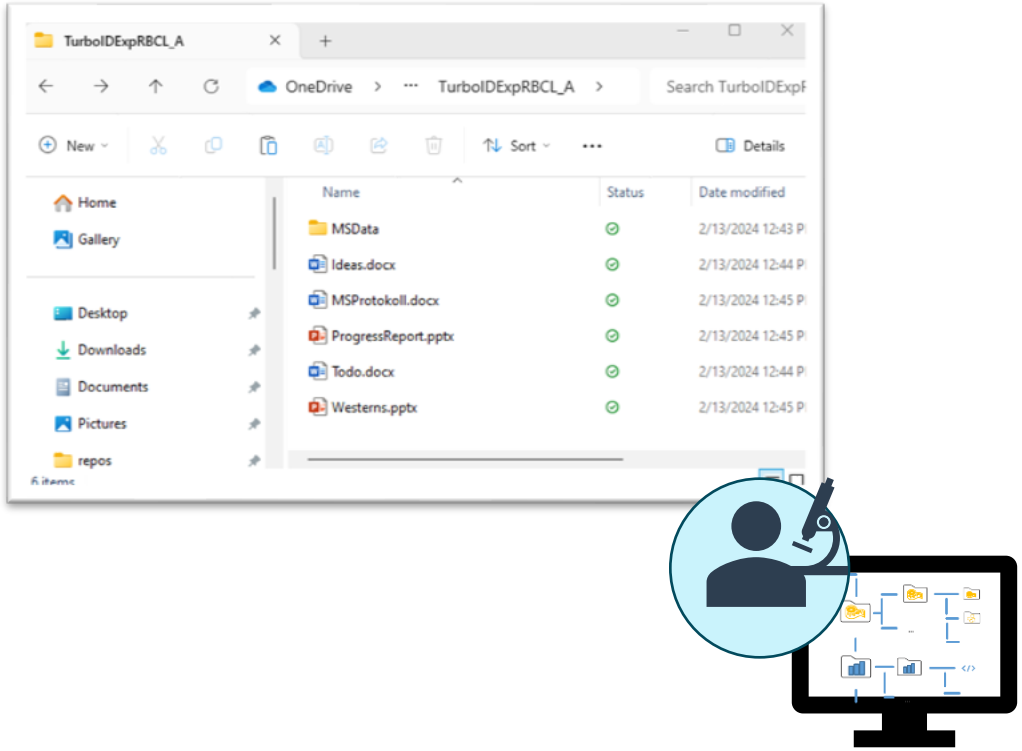
175

Legacy RDM

Researcher As data management solution:

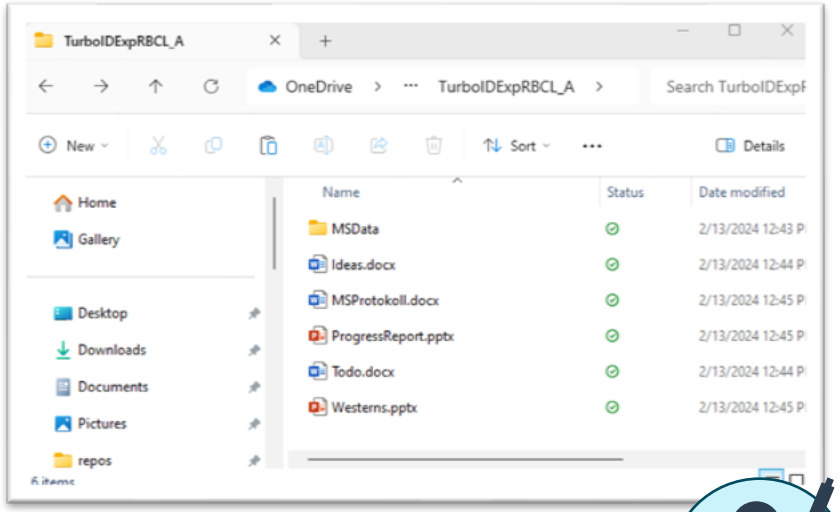


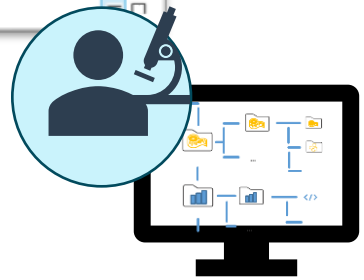
Researcher A

Until recently: Individual RDM solutions

Legacy RDM

Researcher As data management solution:





Researcher A

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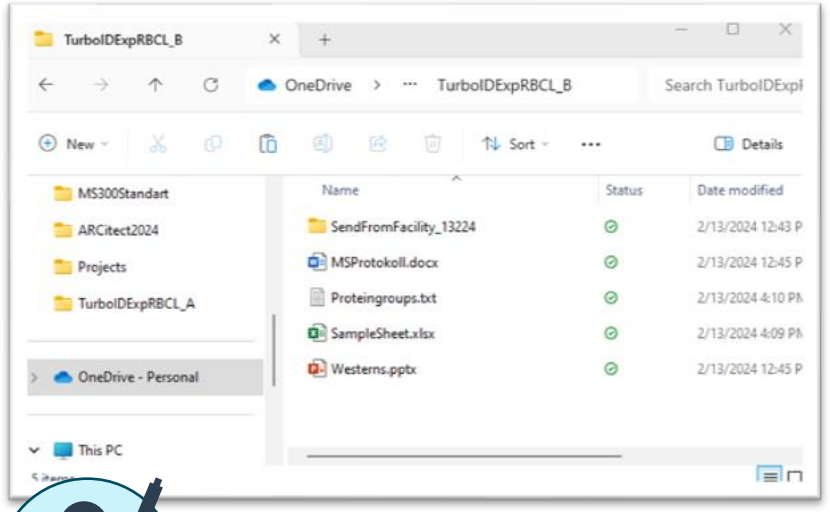

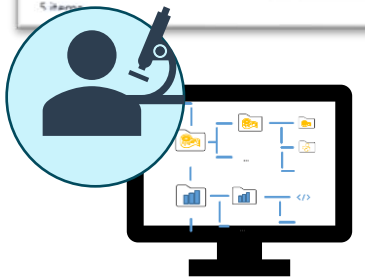

Researcher B

Until recently: Individual RDM solutions

Legacy RDM

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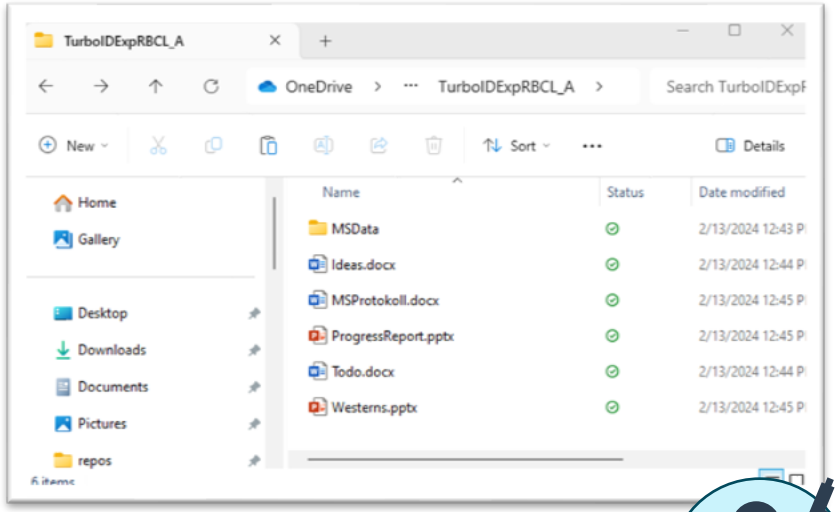

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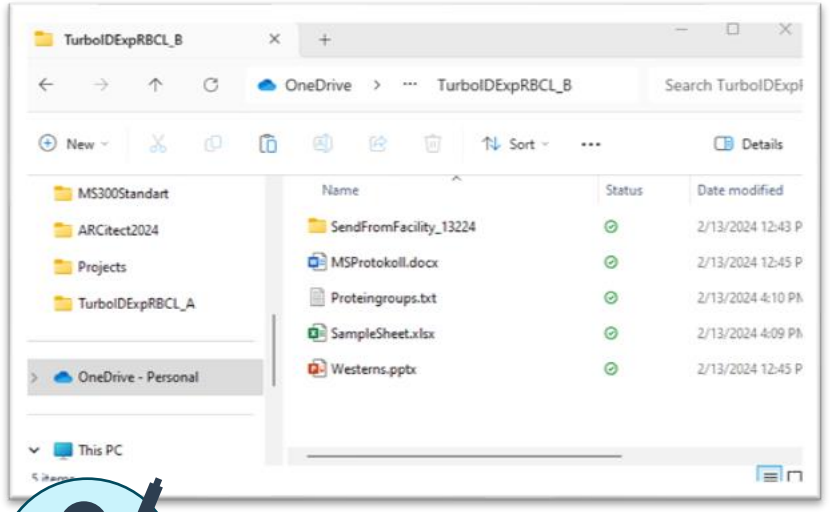
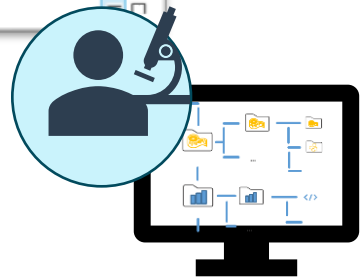
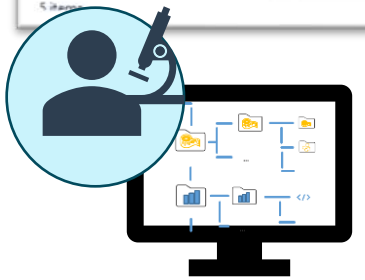




Researcher A

Collaboration

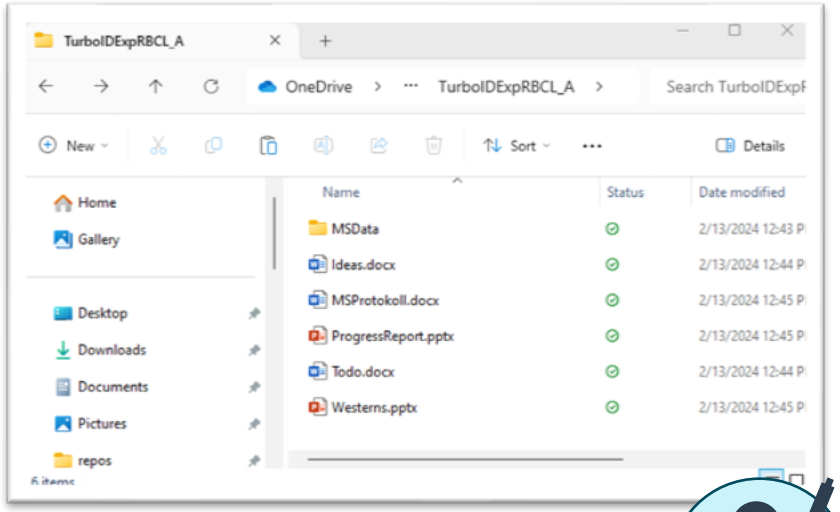


Researcher B

Until recently: Individual RDM solutions

Legacy RDM

Researcher As data management solution:



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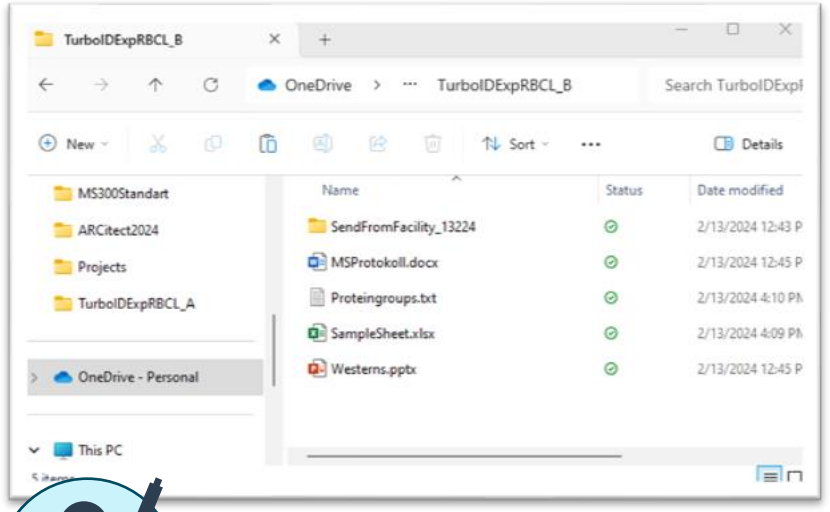
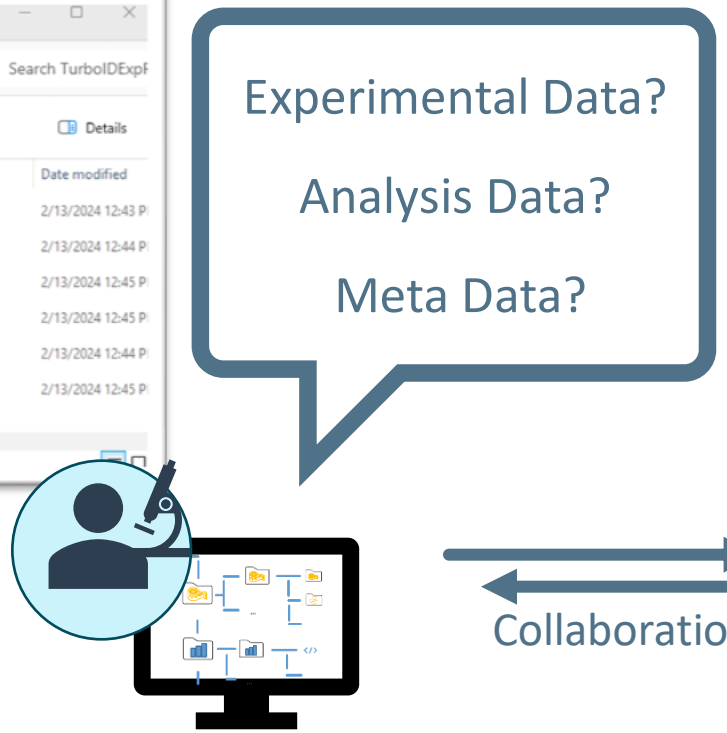
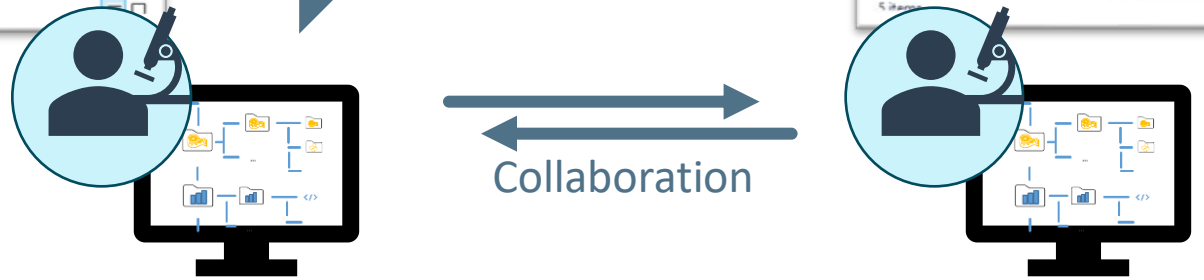






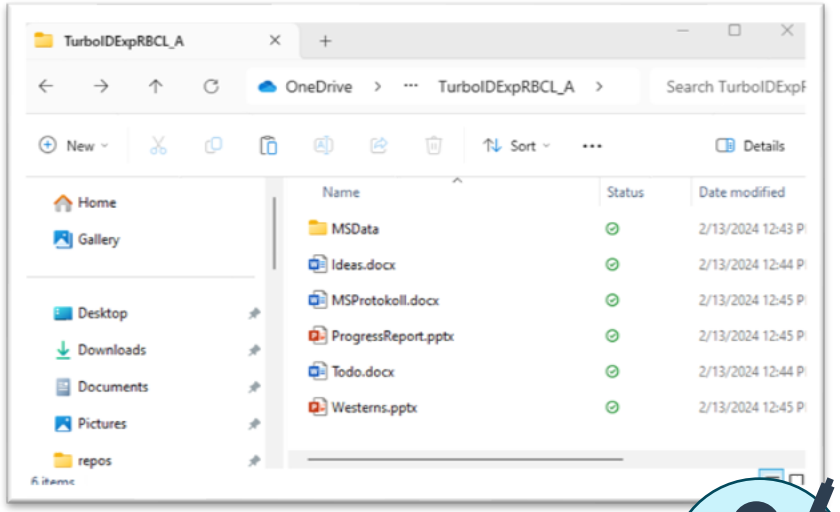
Researcher A

Researcher B

Until recently: Individual RDM solutions

Legacy RDM

Researcher As data management solution:



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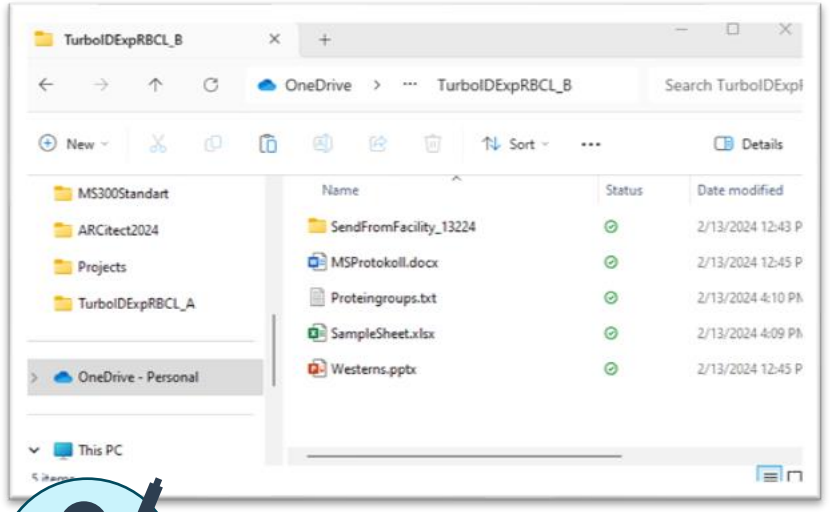
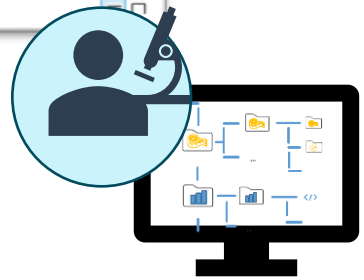


How do we exchange data?

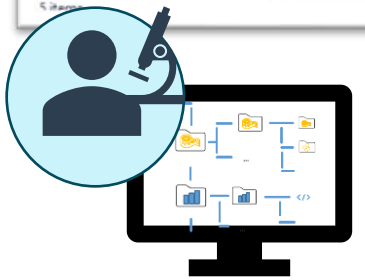
More Metadata?

Any Updates?



Researcher A

Collaboration

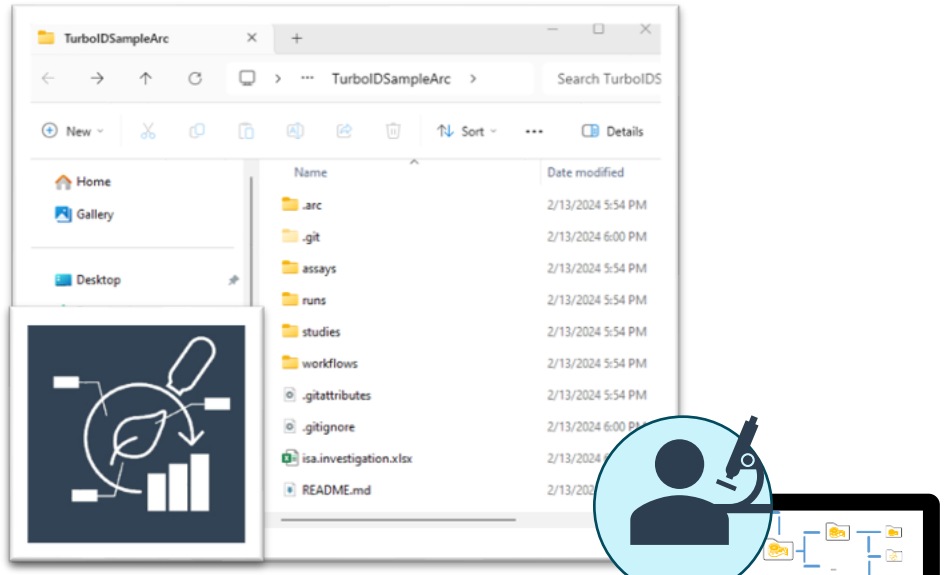


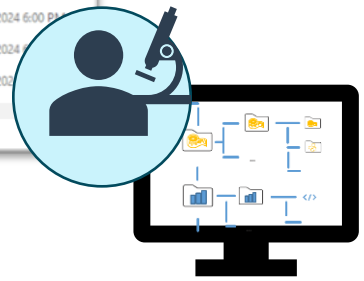
Researcher B

Until recently: Individual RDM solutions

State of the art: ARC

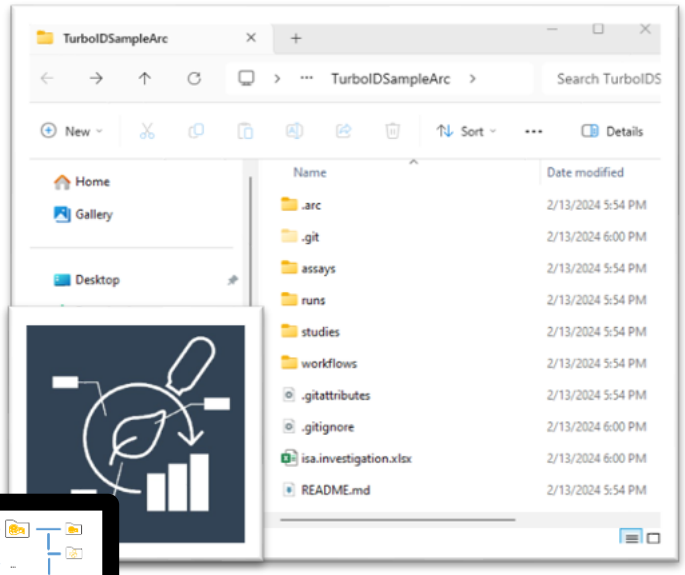
Researcher As data management solution:

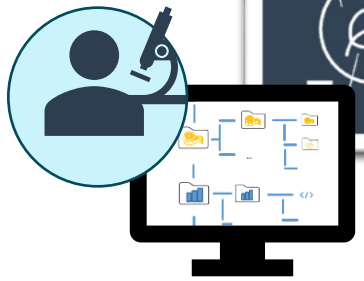




Researcher A

Researcher Bs data management solution:



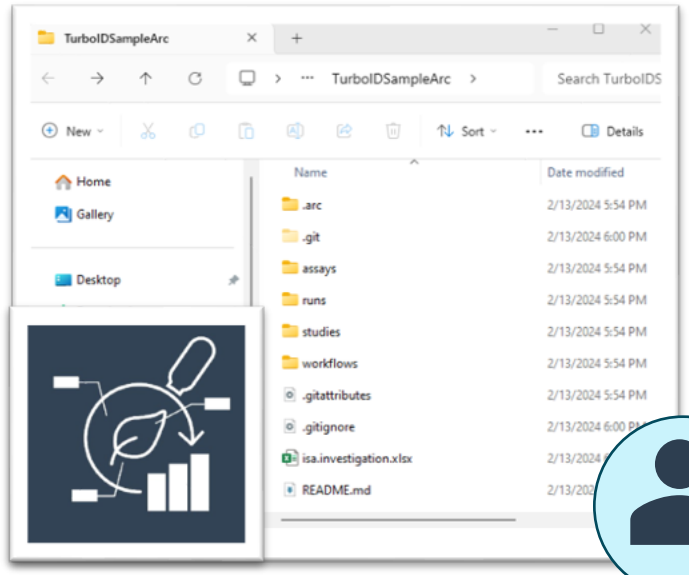


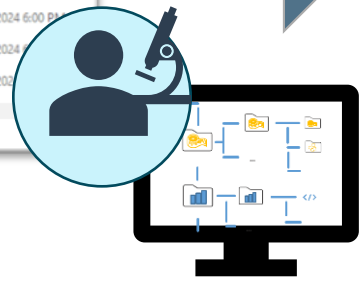
Researcher B

Now: ARCs as a single RDM entry point

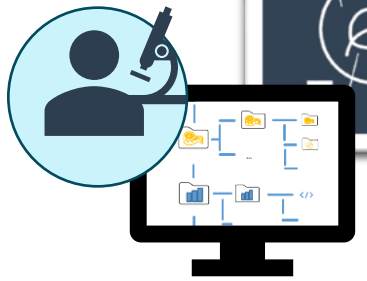
State of the art: ARC

Researcher As data management solution:



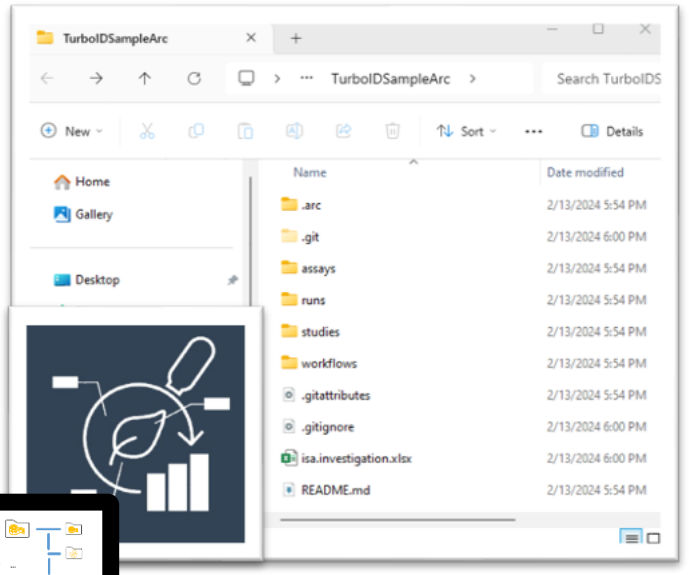


Researcher A



Researcher B

Researcher Bs data management solution:



Now: ARCs as a single RDM entry point

State of the art: ARC

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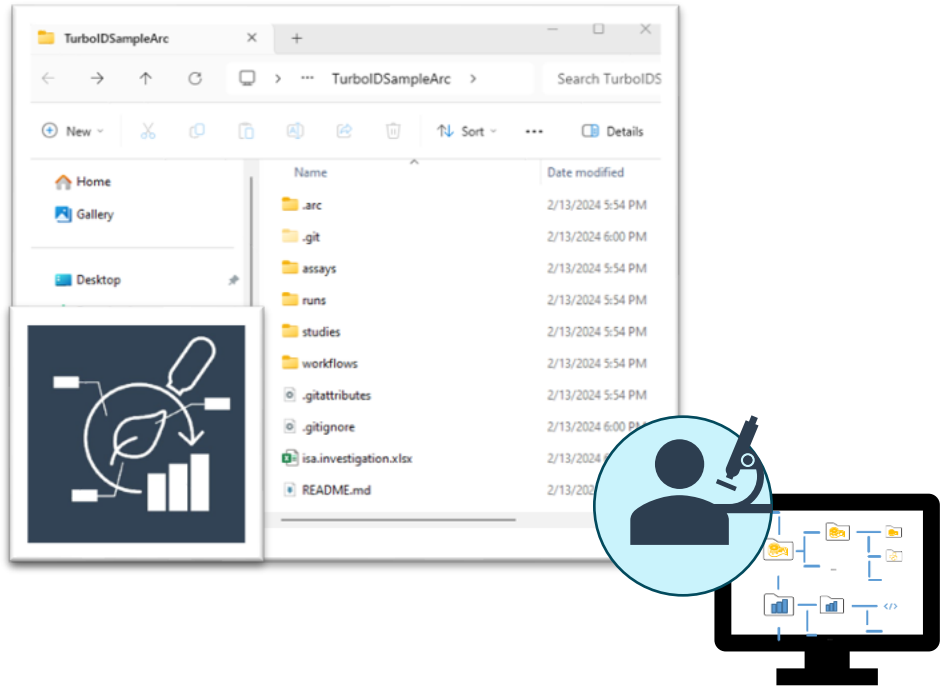
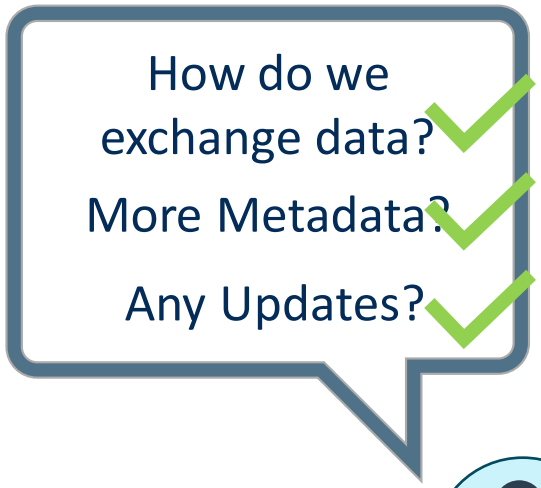


Researcher A



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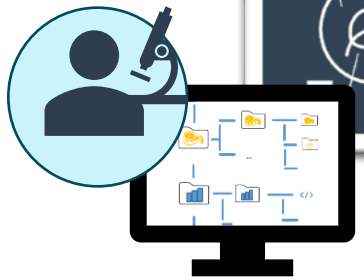
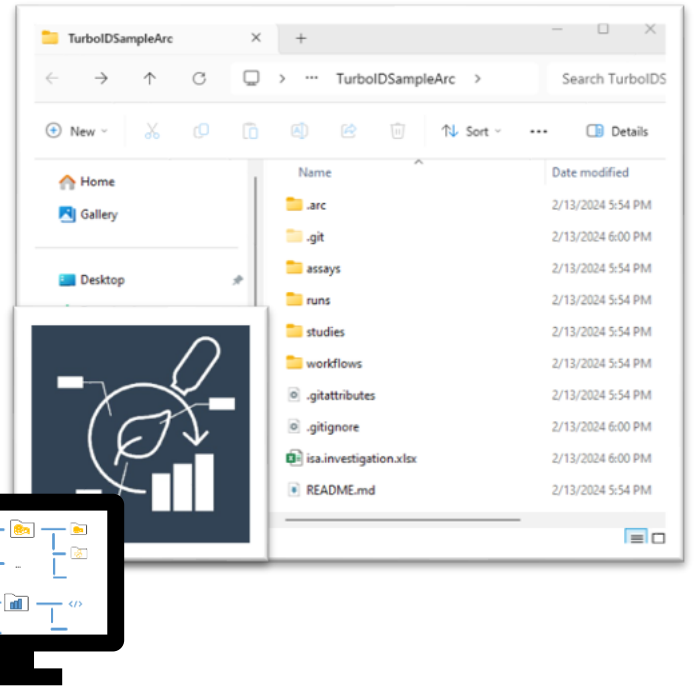
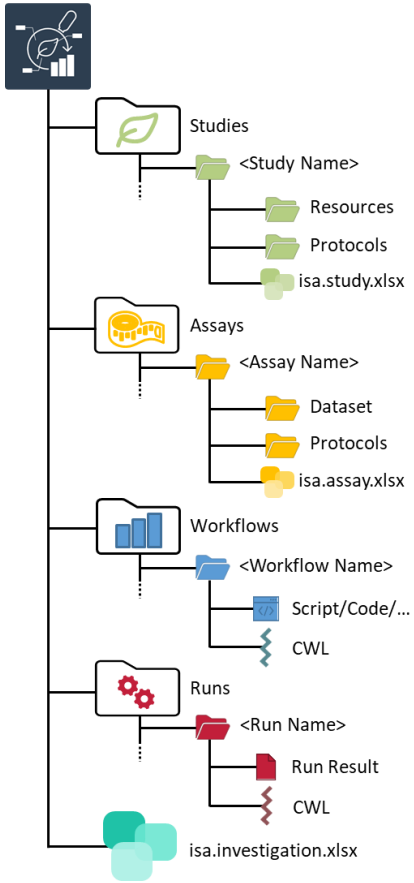


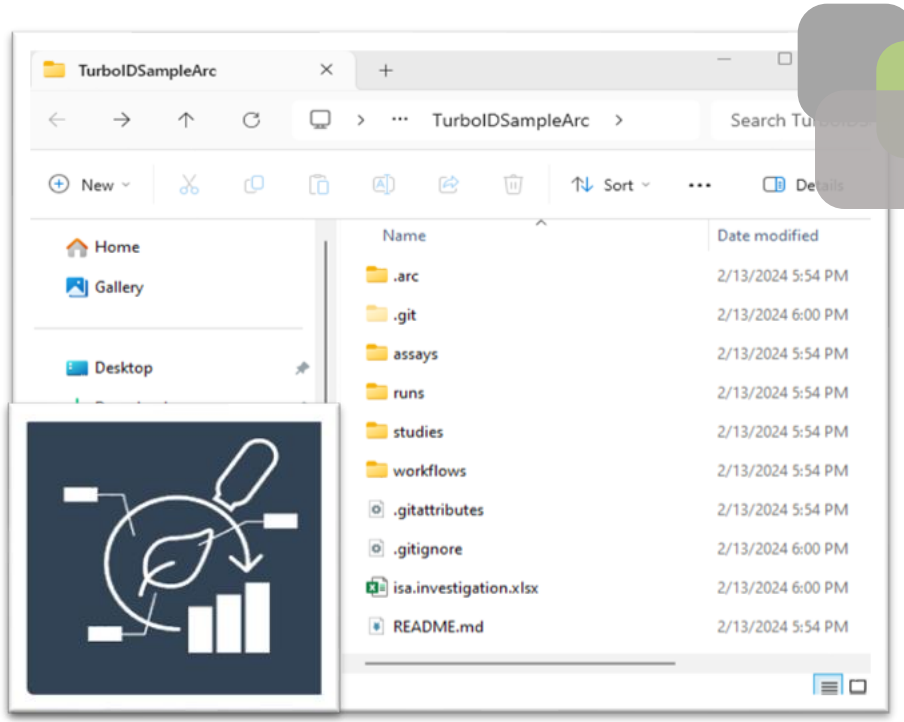


Researcher B

Now: ARCs as a single RDM entry point

State of the art: ARC





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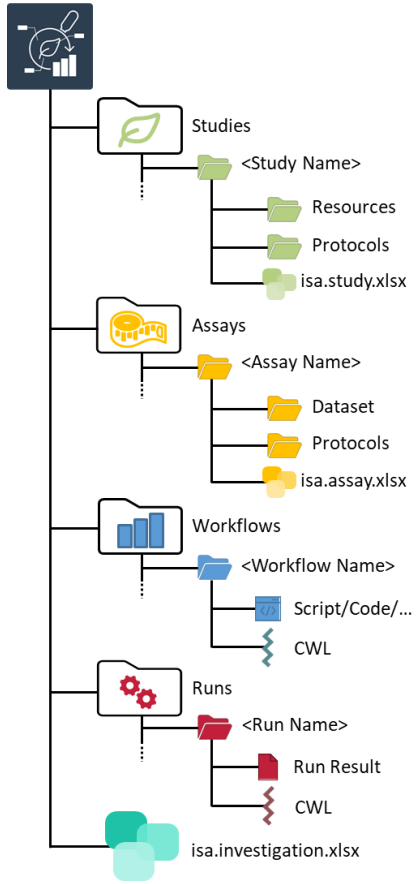
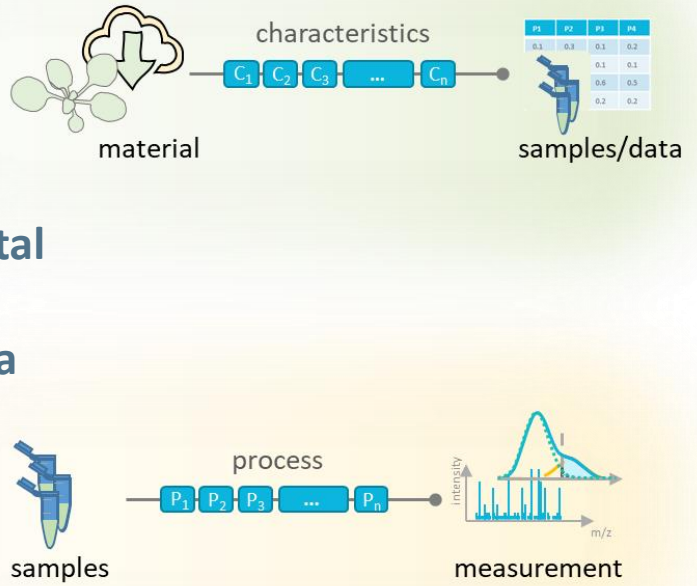
Important ARC Concepts: Structure

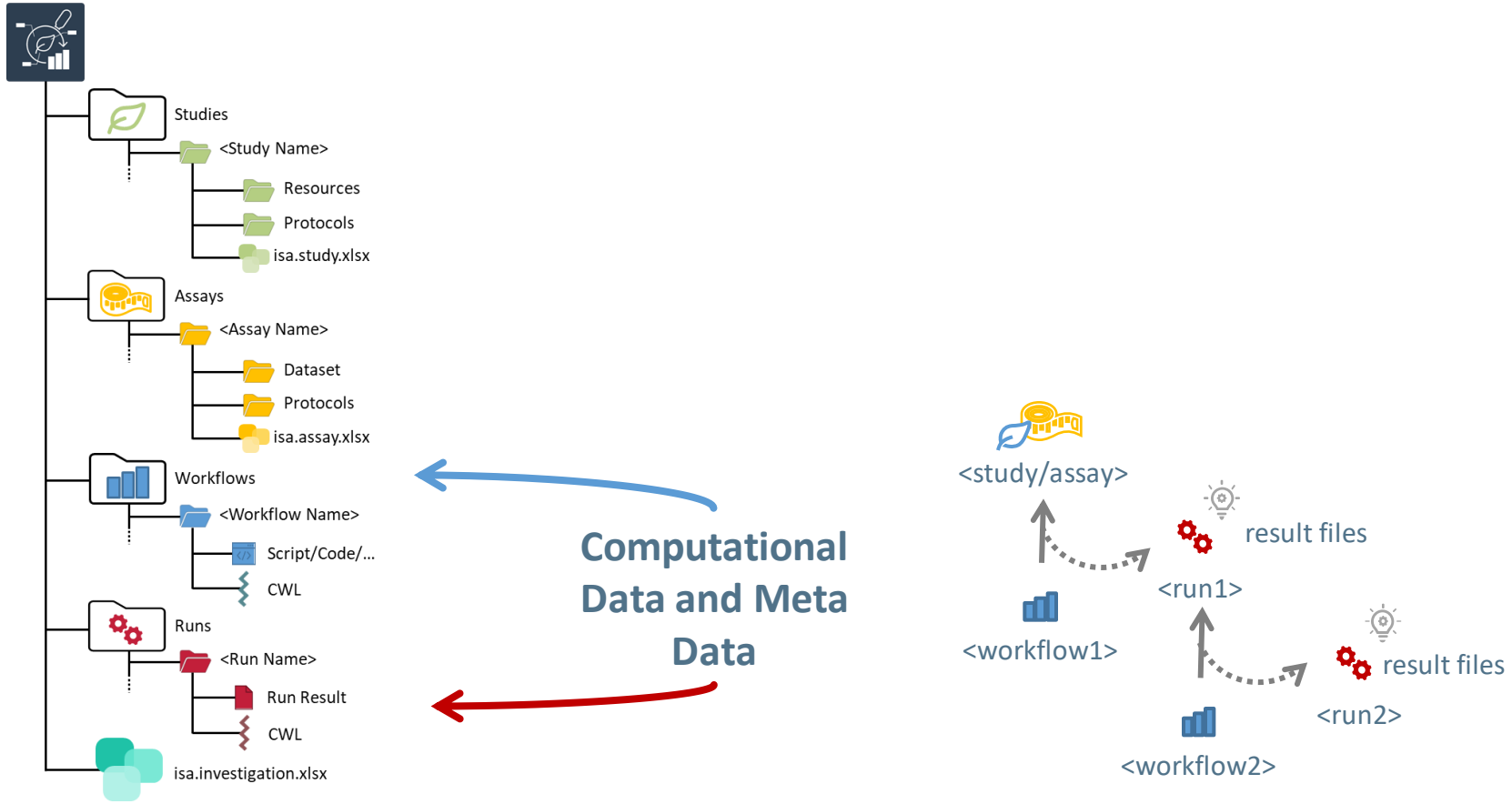
State of the art: ARC





Important ARC Concepts: Structure

State of the art: ARC



Important ARC Concepts: Structure

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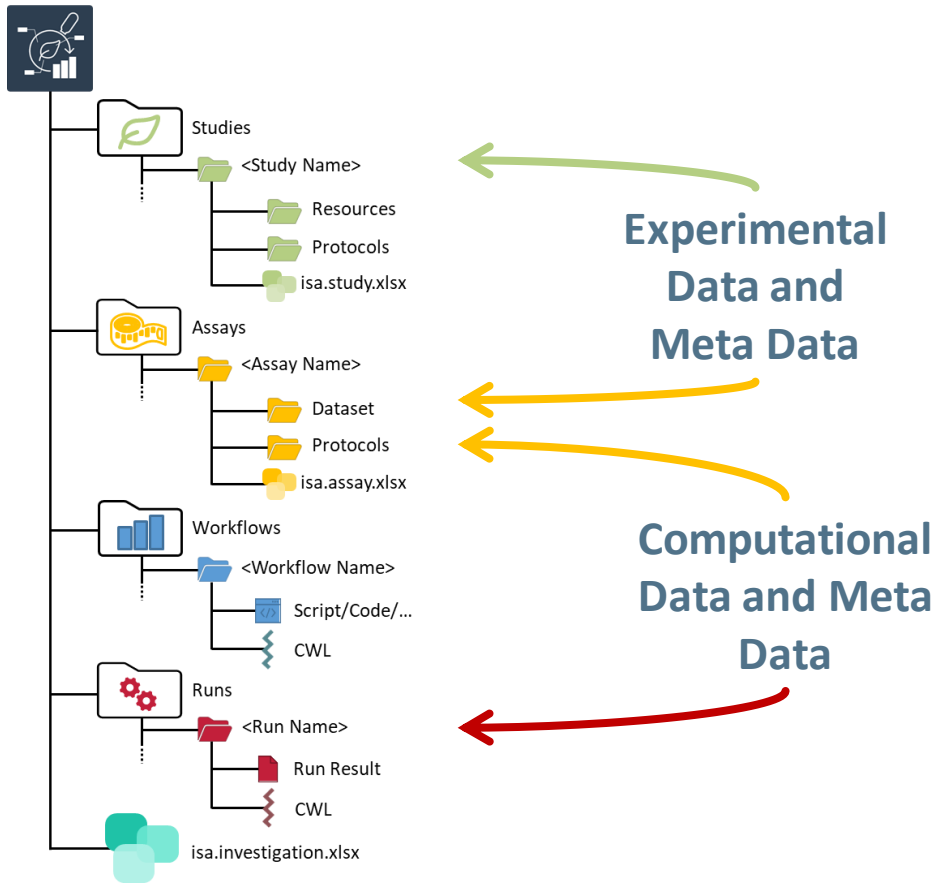
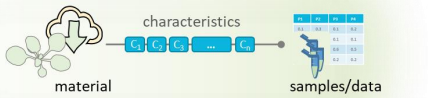
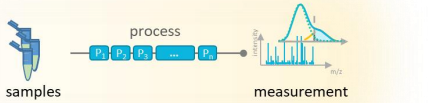
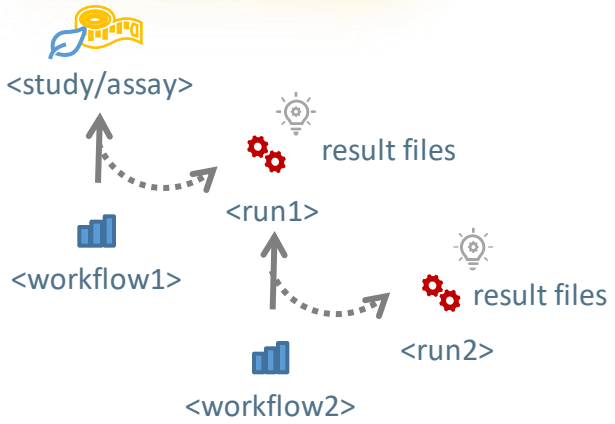


Experimental Data and Meta Data

Computational Data and Meta Data

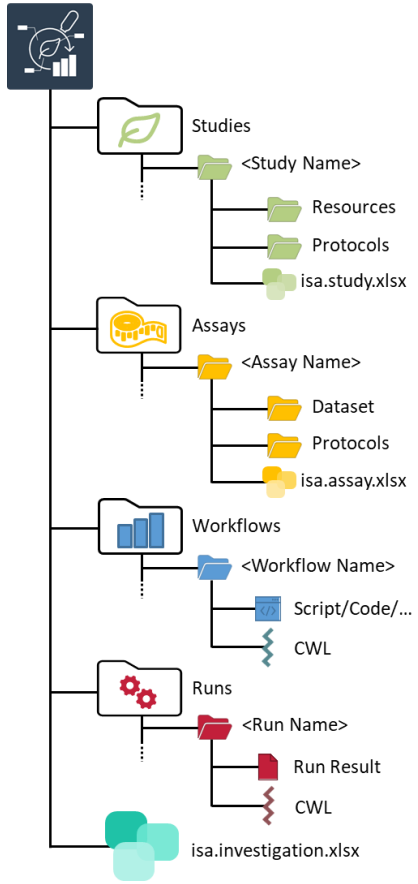


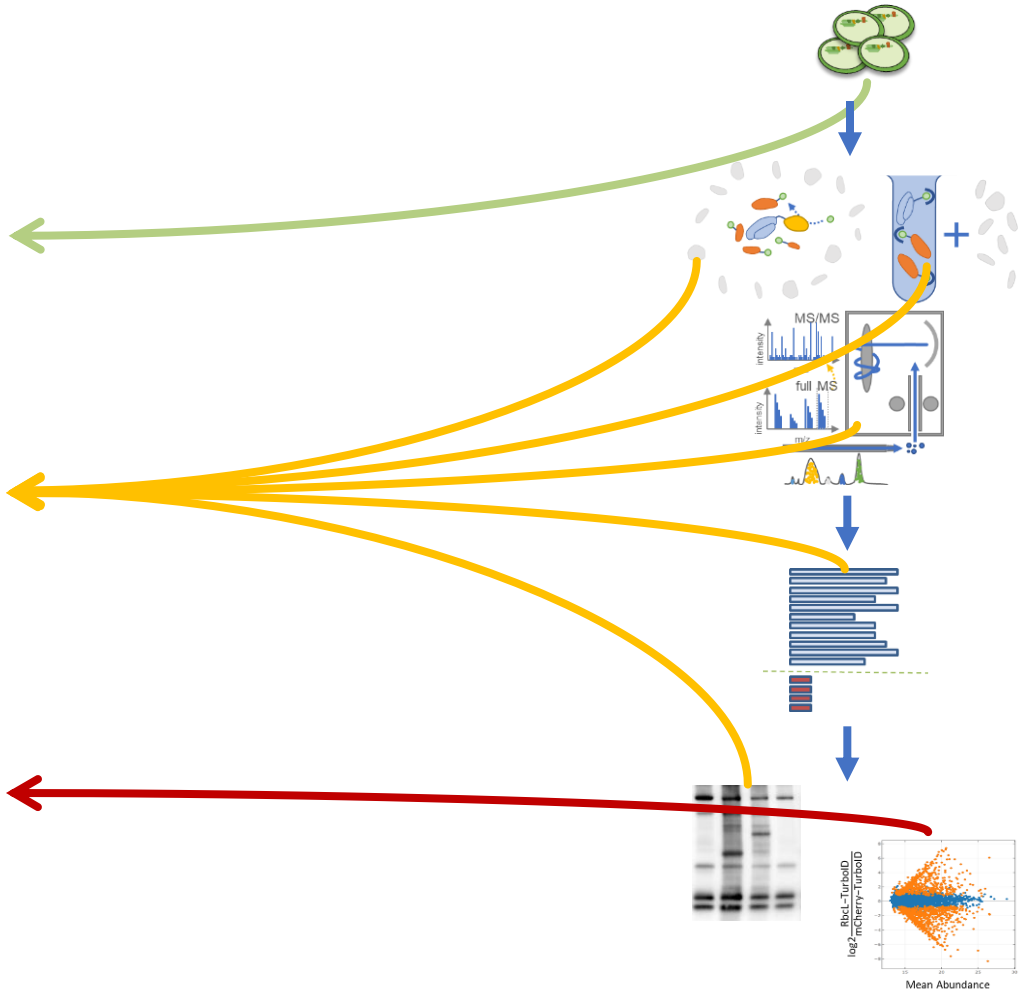




Important ARC Concepts: Structure

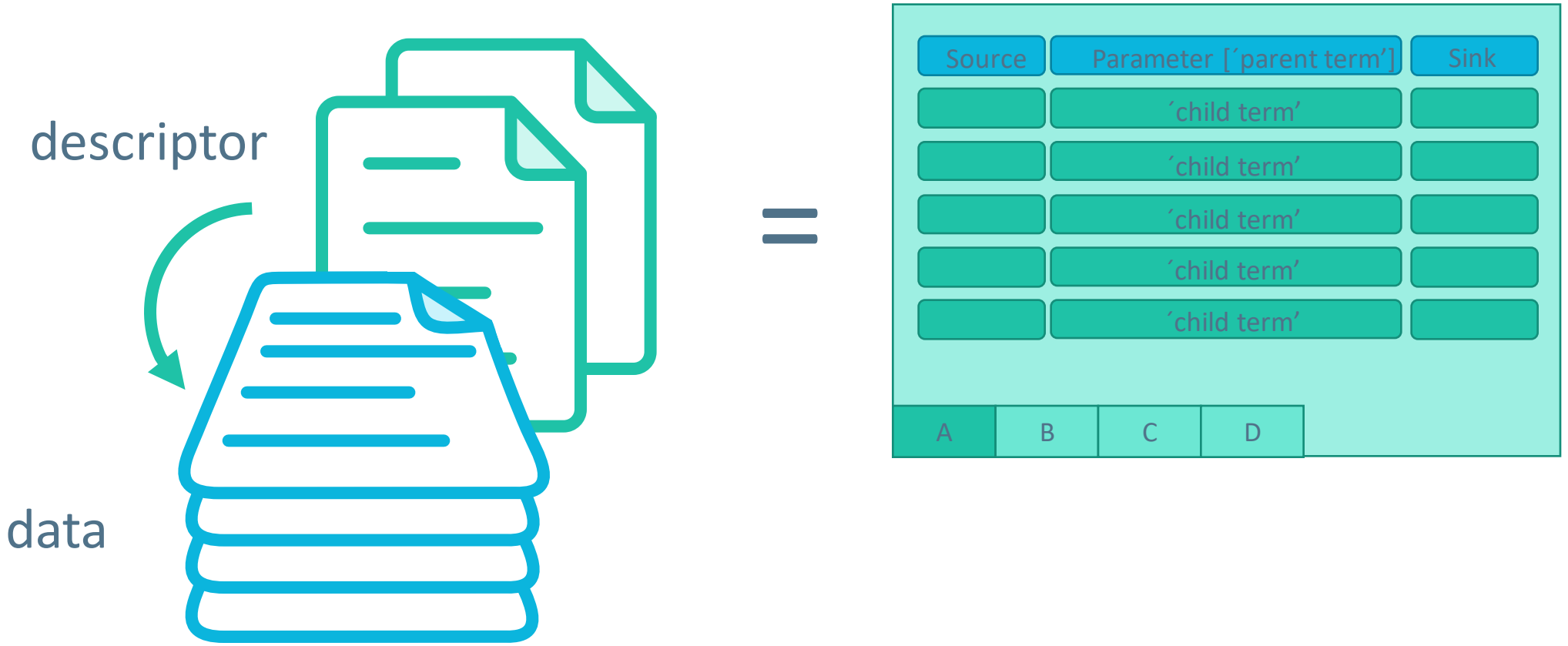
State of the art: ARC





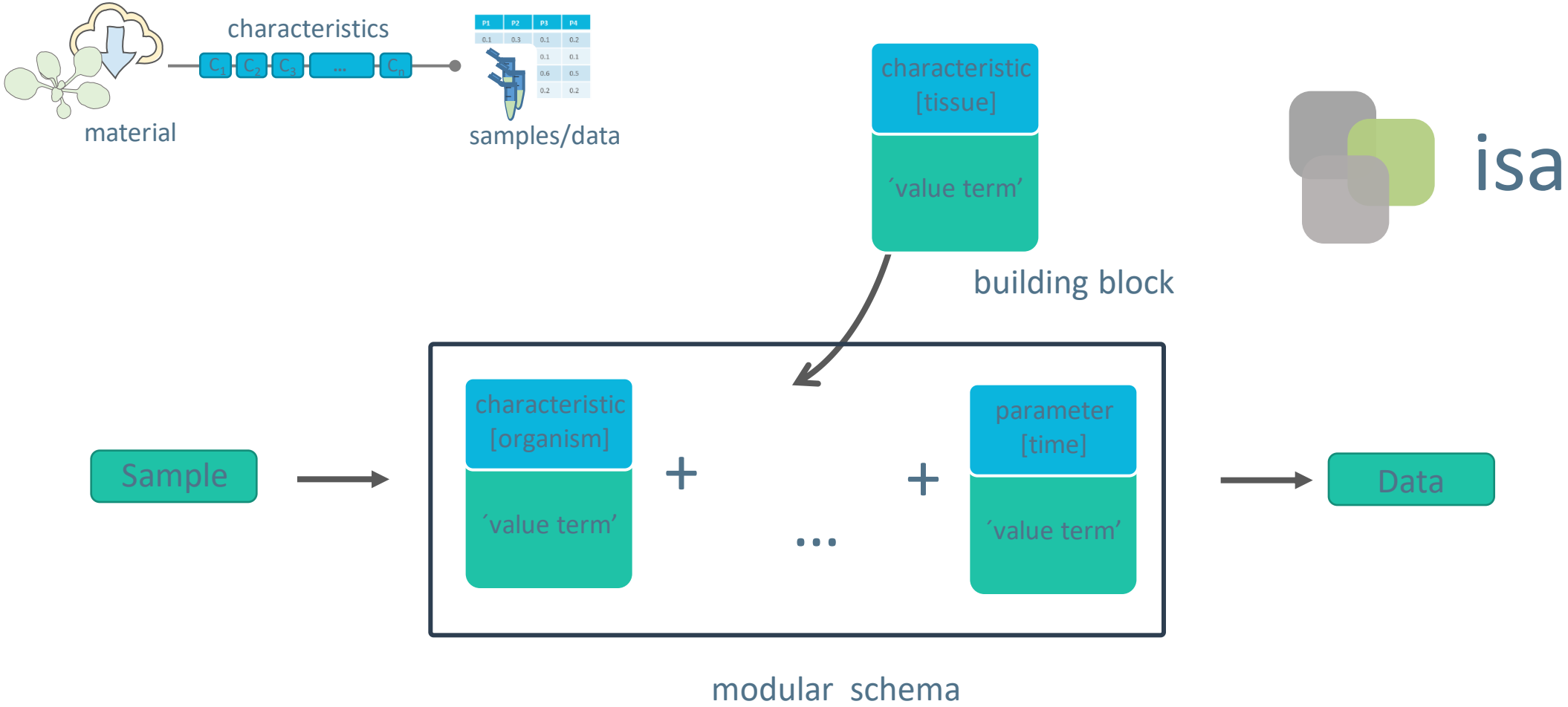
Important ARC Concepts: Structure

State of the art: Meta Data Annotation Principle



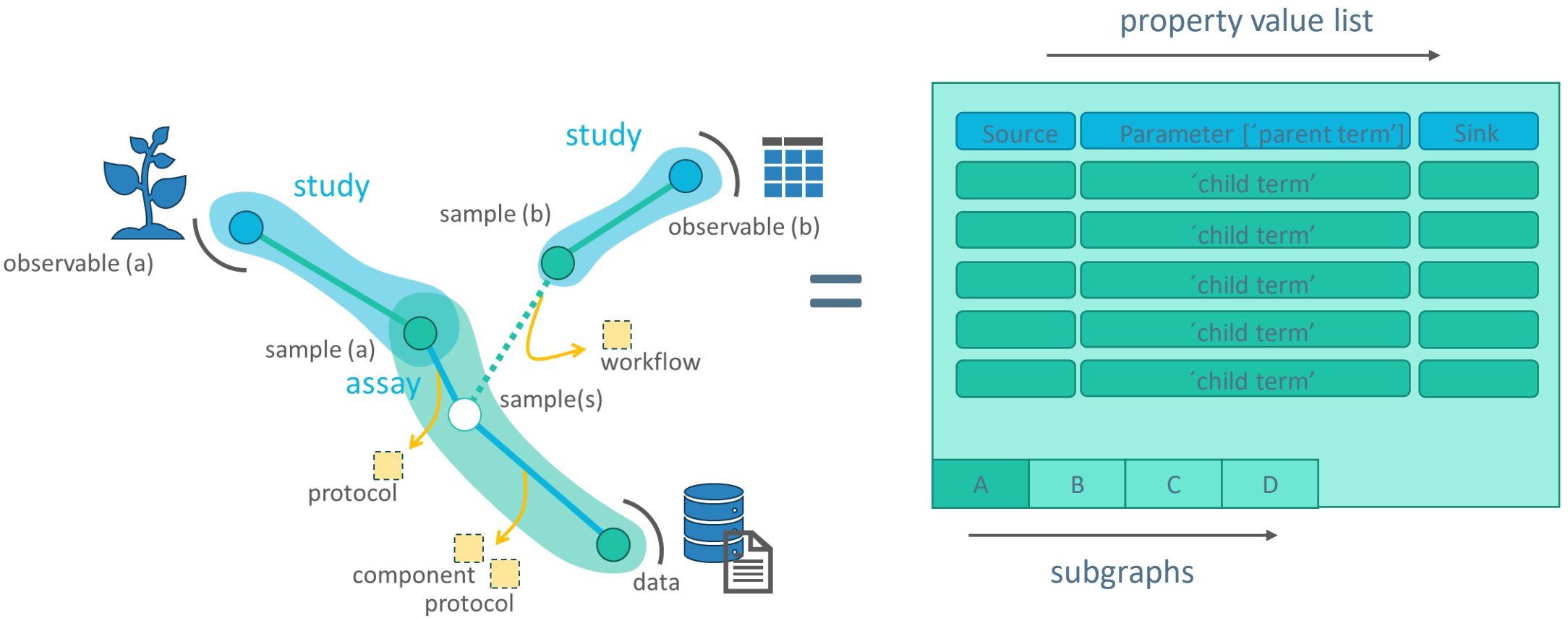
Important ARC Concepts: Meta Data Annotation

State of the art: Meta Data Annotation Principle



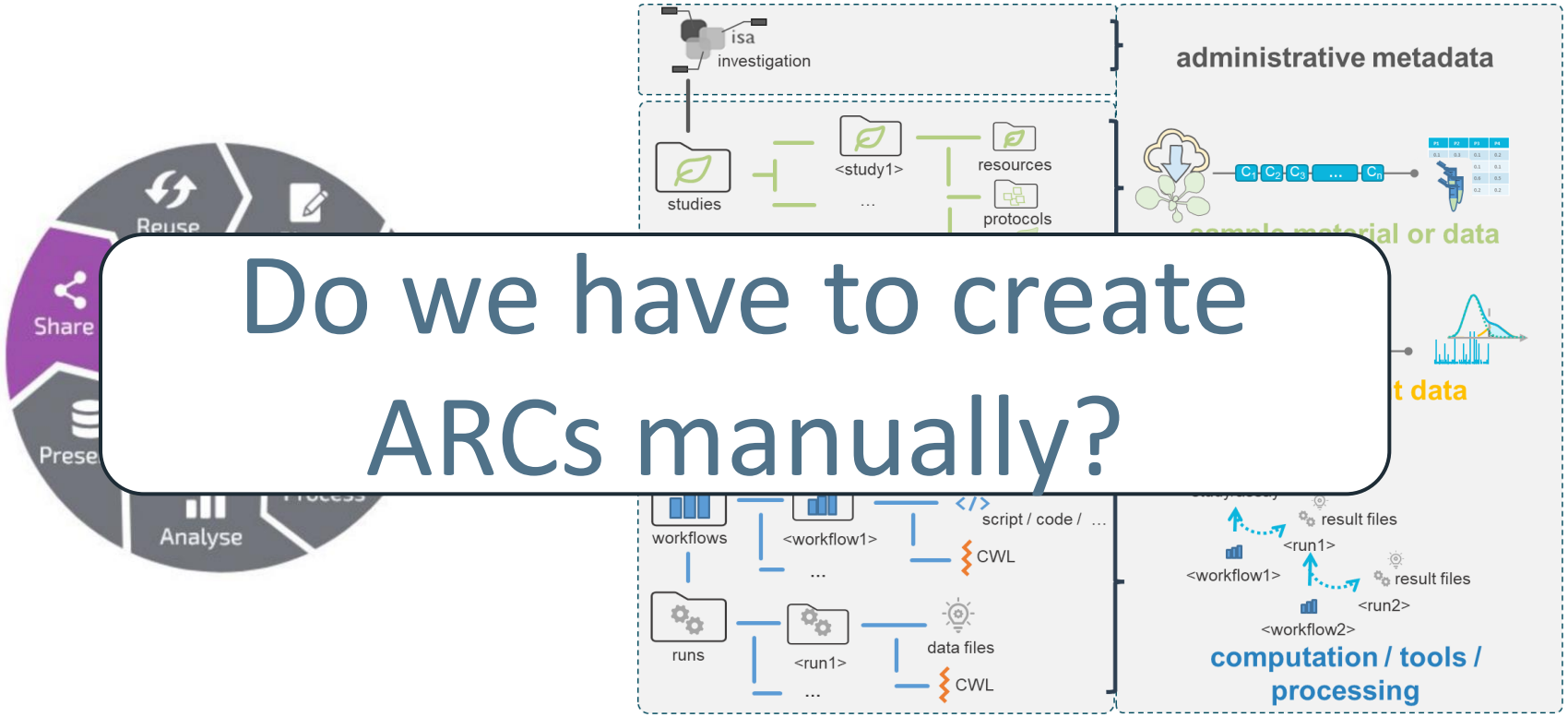
Important ARC Concepts: Meta Data Annotation

State of the art: Meta Data Annotation Principle



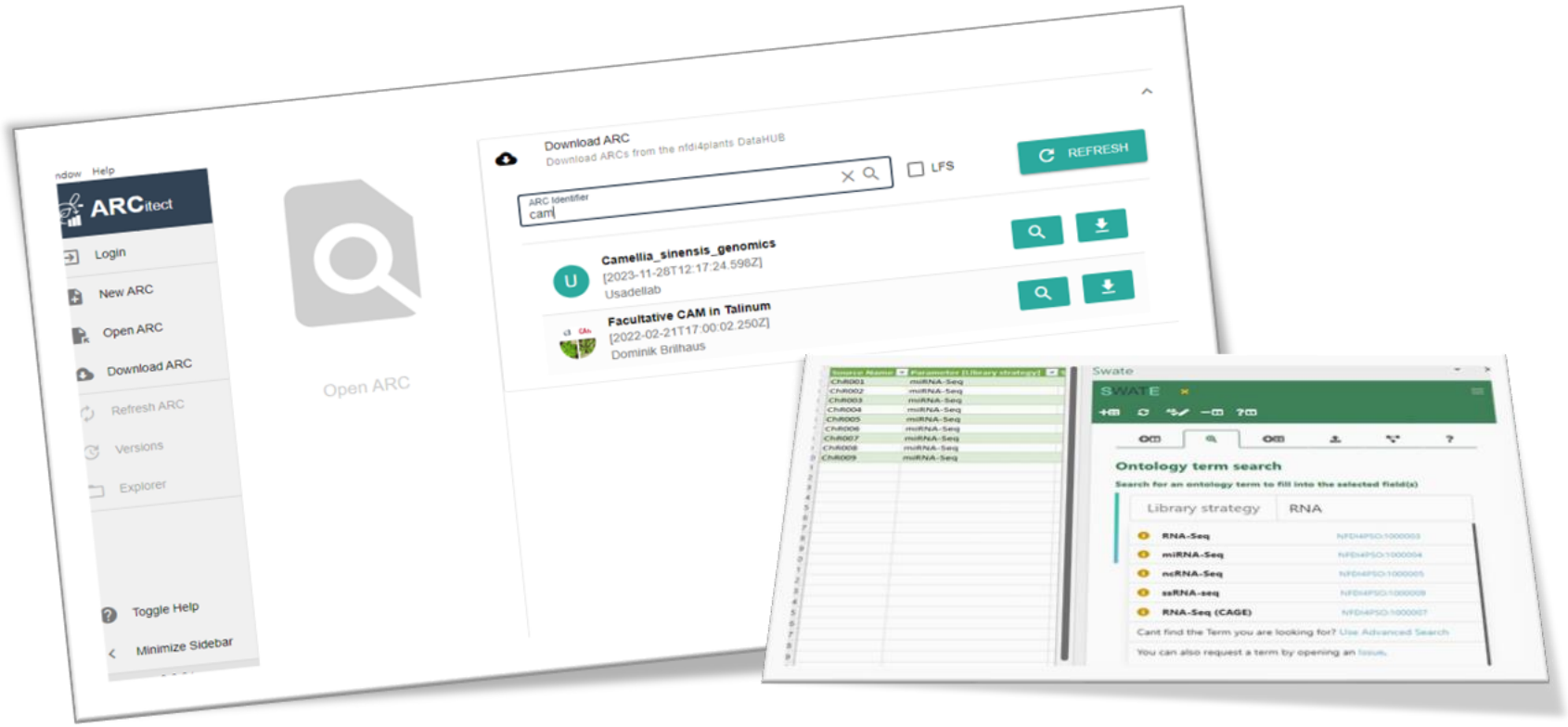
Important ARC Concepts: Meta Data Annotation

State of the art: ARC



- FAIR and easy: The Annotated Research Context

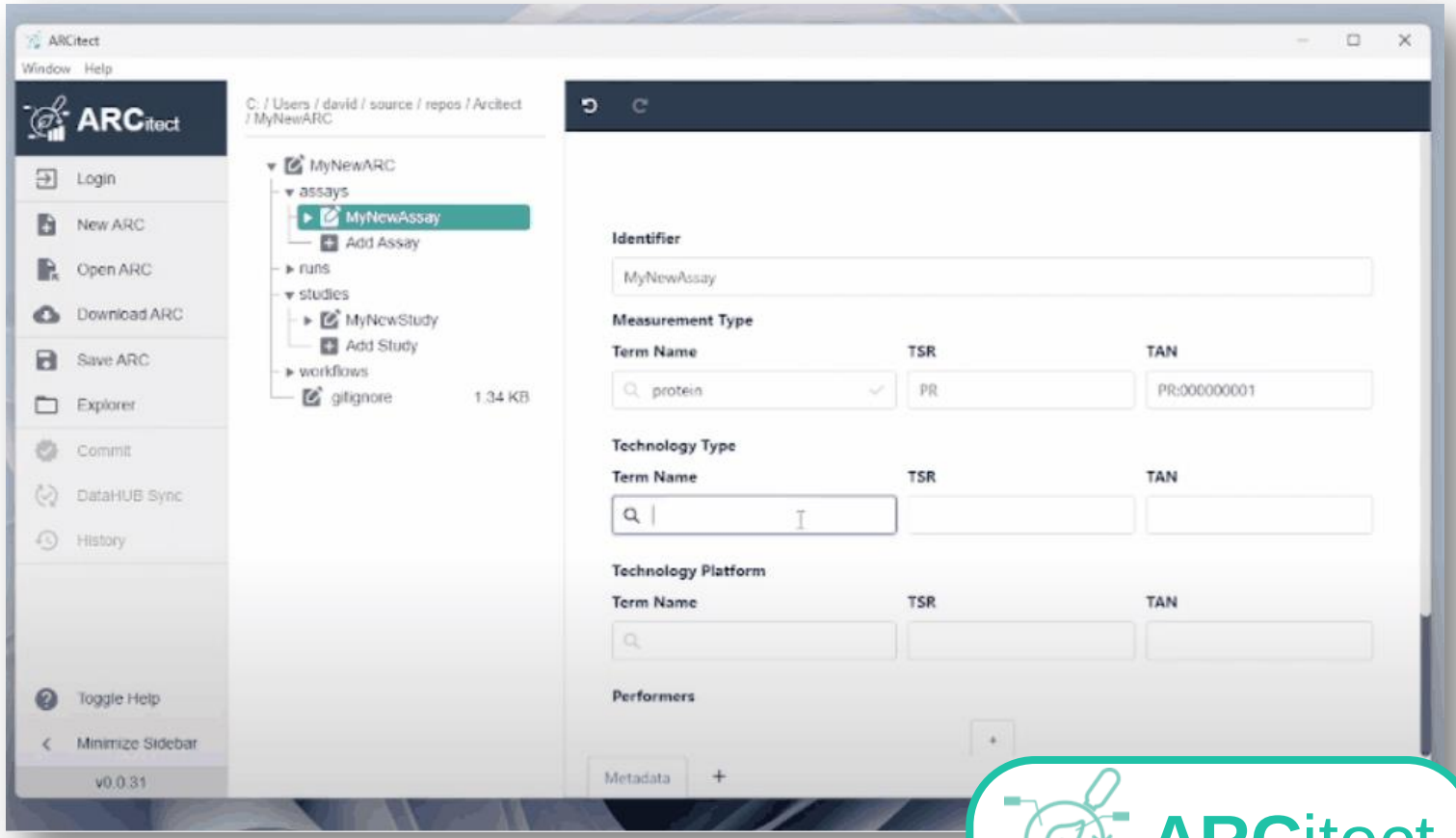
State of the art: Tooling



- Growing technical-digital assistance: From ARCommander and SWATE to ARCitect

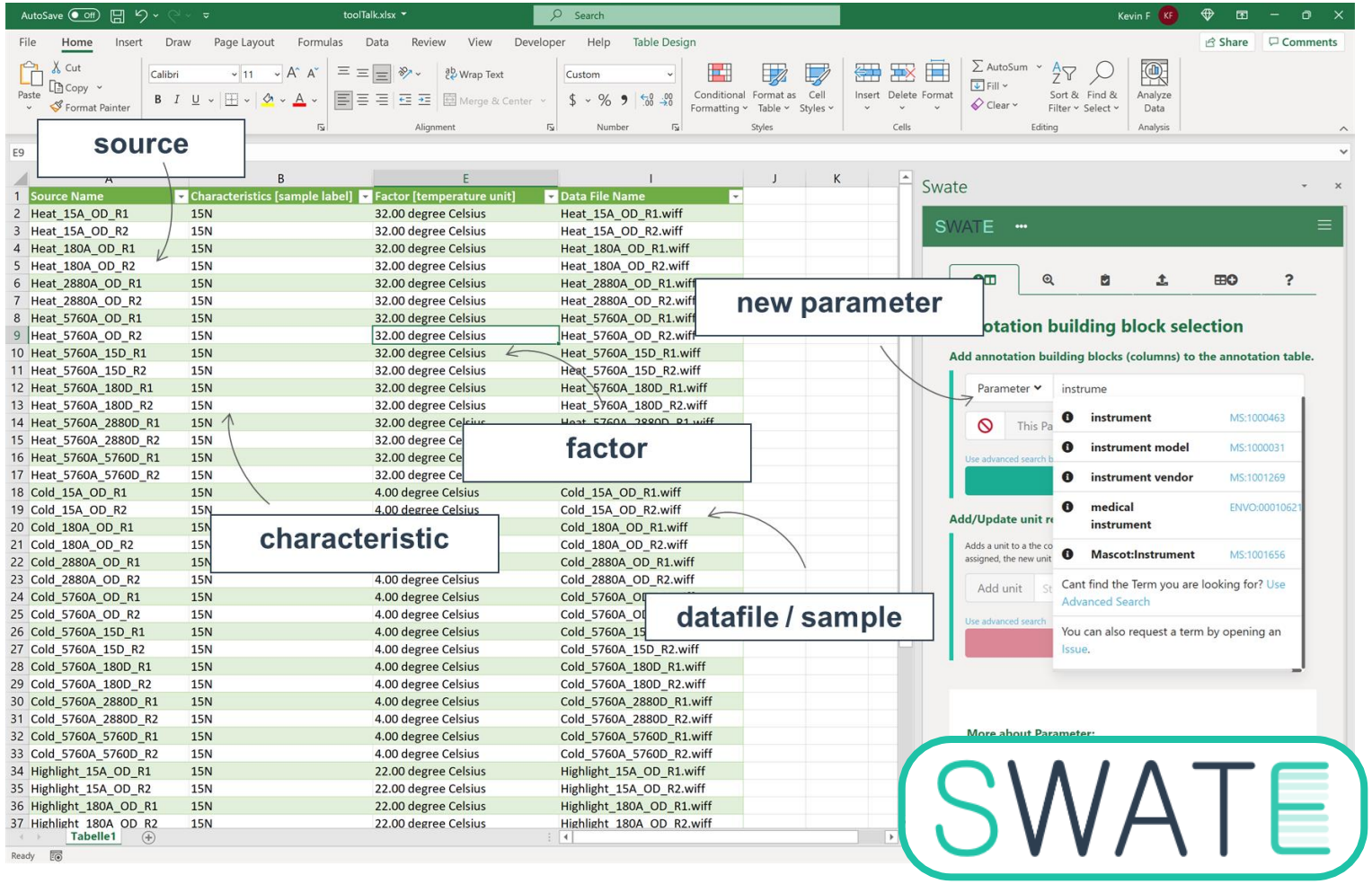
State of the art: The ARCitect

- The **ARCitect** offers a simple **Graphical User interface** to create and manage **ARCs**
- Deployed as an Electron App, the **ARCitect** is available on **Windows, Linux and Mac**



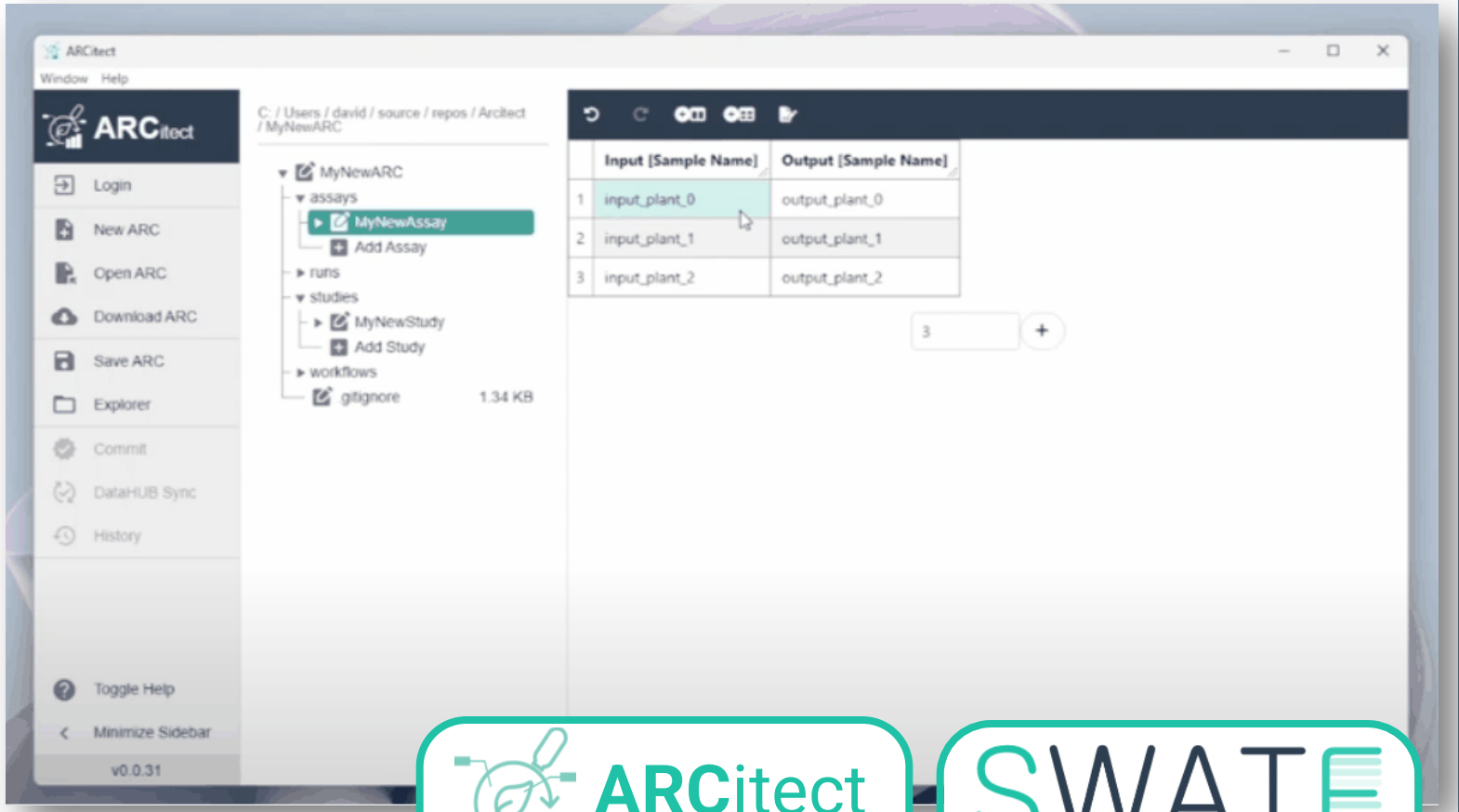
State of the art: SWATE

- The **SWATE Tool** eases annotation in line with **ISA standards**
- SWATE is available on **web** and **desktop** platforms, as an independent tool or as a **plugin-based application**

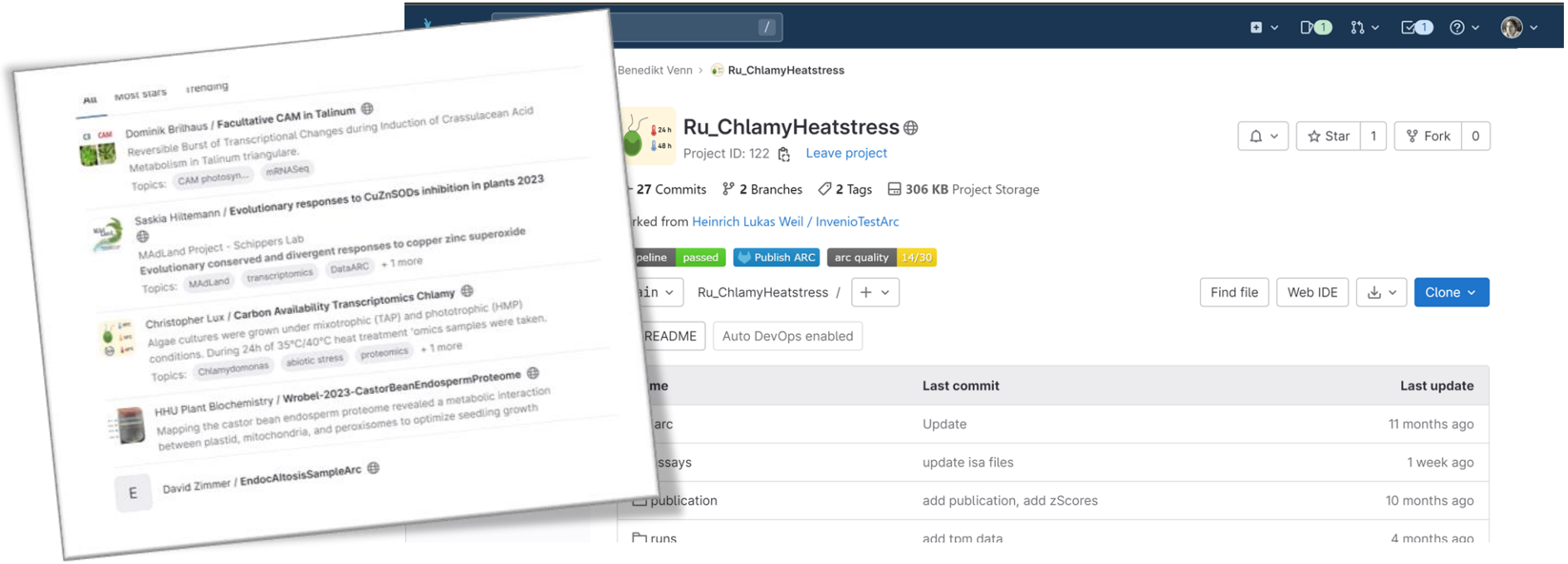


State of the art: ARCitect + SWATE

- The **SWATE Tool** eases annotation in line with **ISA standards**
- SWATE is available on **web** and **desktop** platforms, as an independent tool or as a **plugin-based application**



State of the art: PLANTdataHUB



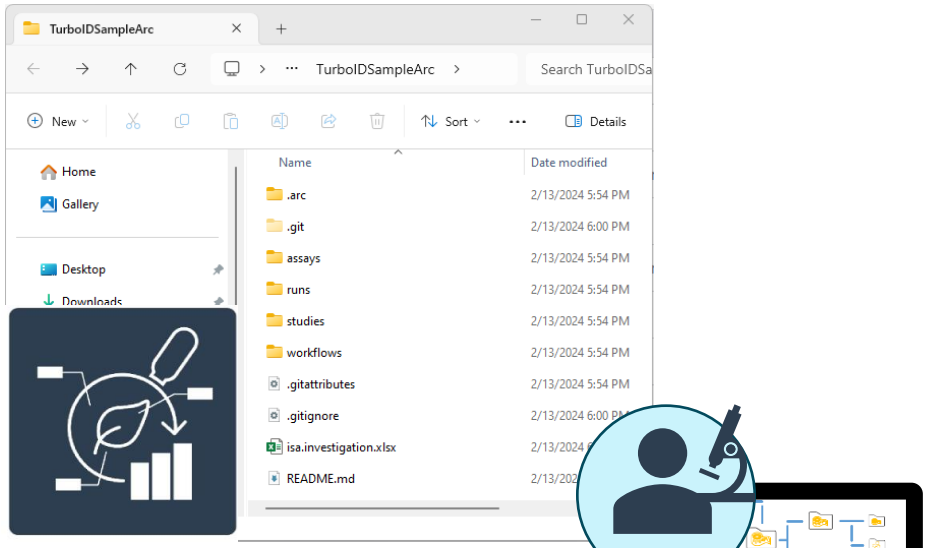
The Plant Journal **2023** https://doi.org/10.1111/tpj.16474

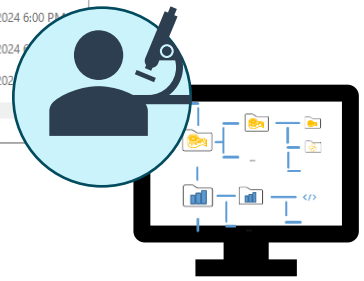
- Growing a PLANTdataHUB

Z01
A04
A05
B02
B03
B06
B08
C02
C06
C07
D02

Now: ARCs as a single RDM entry point

Researcher As data management solution:
Annotated Research Context (ARC)

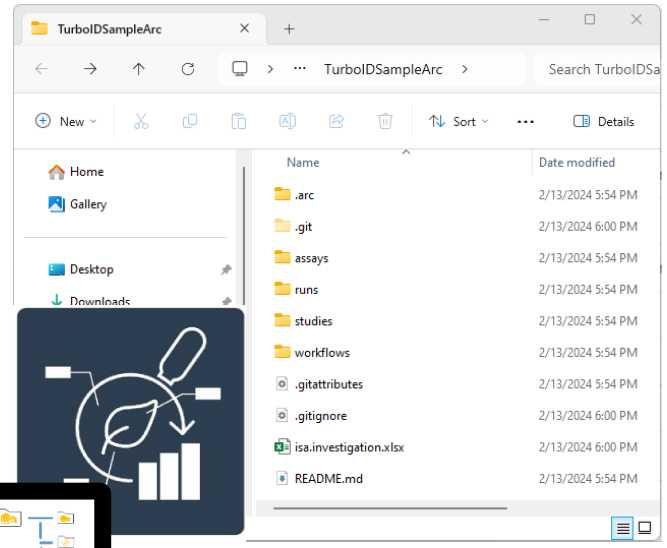


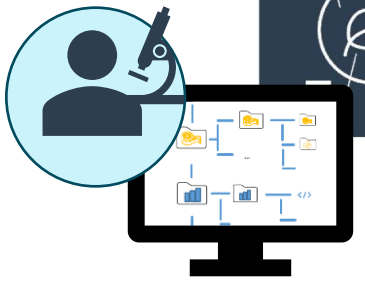


Researcher A

Collaboration

Researcher Bs data management solution:
Annotated Research Context (ARC)



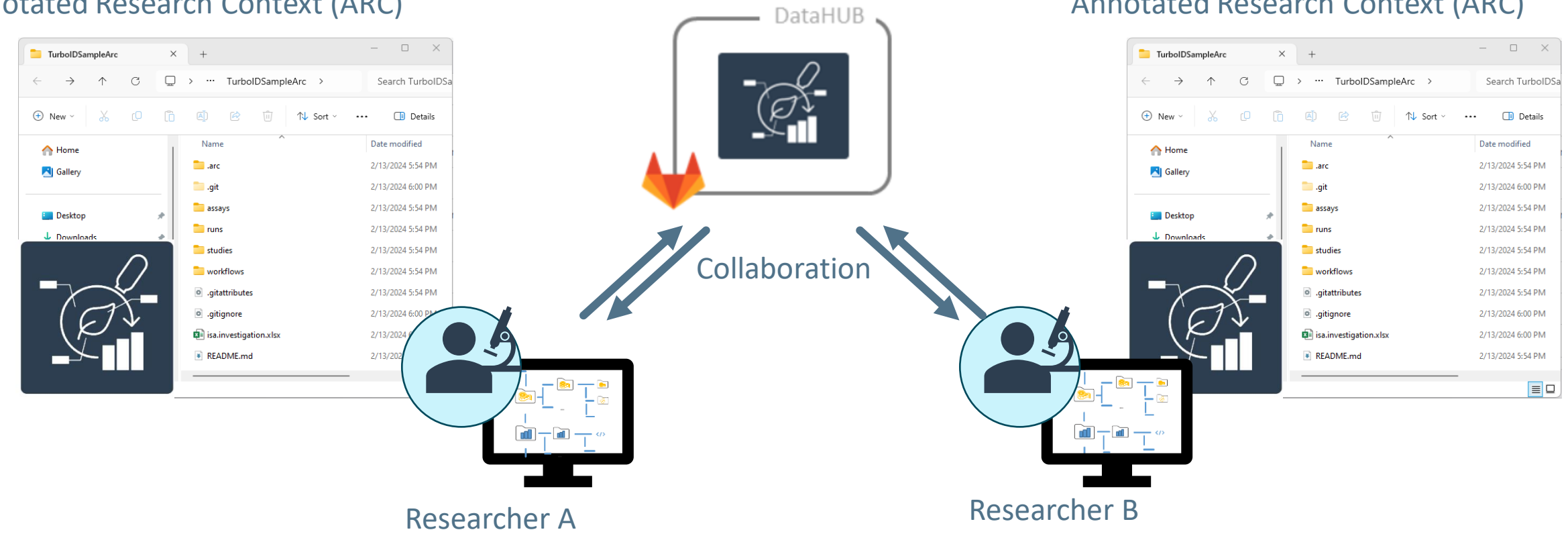


Researcher B

Now: Using the PLANTDataHUB to collaborate

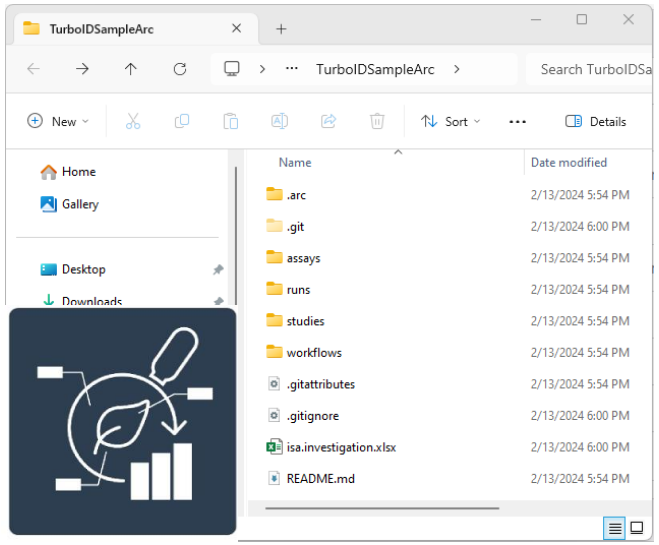
Researcher As data management solution:
Annotated Research Context (ARC)

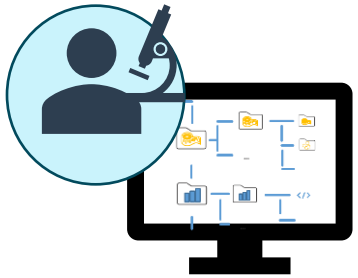
Researcher Bs data management solution:
Annotated Research Context (ARC)



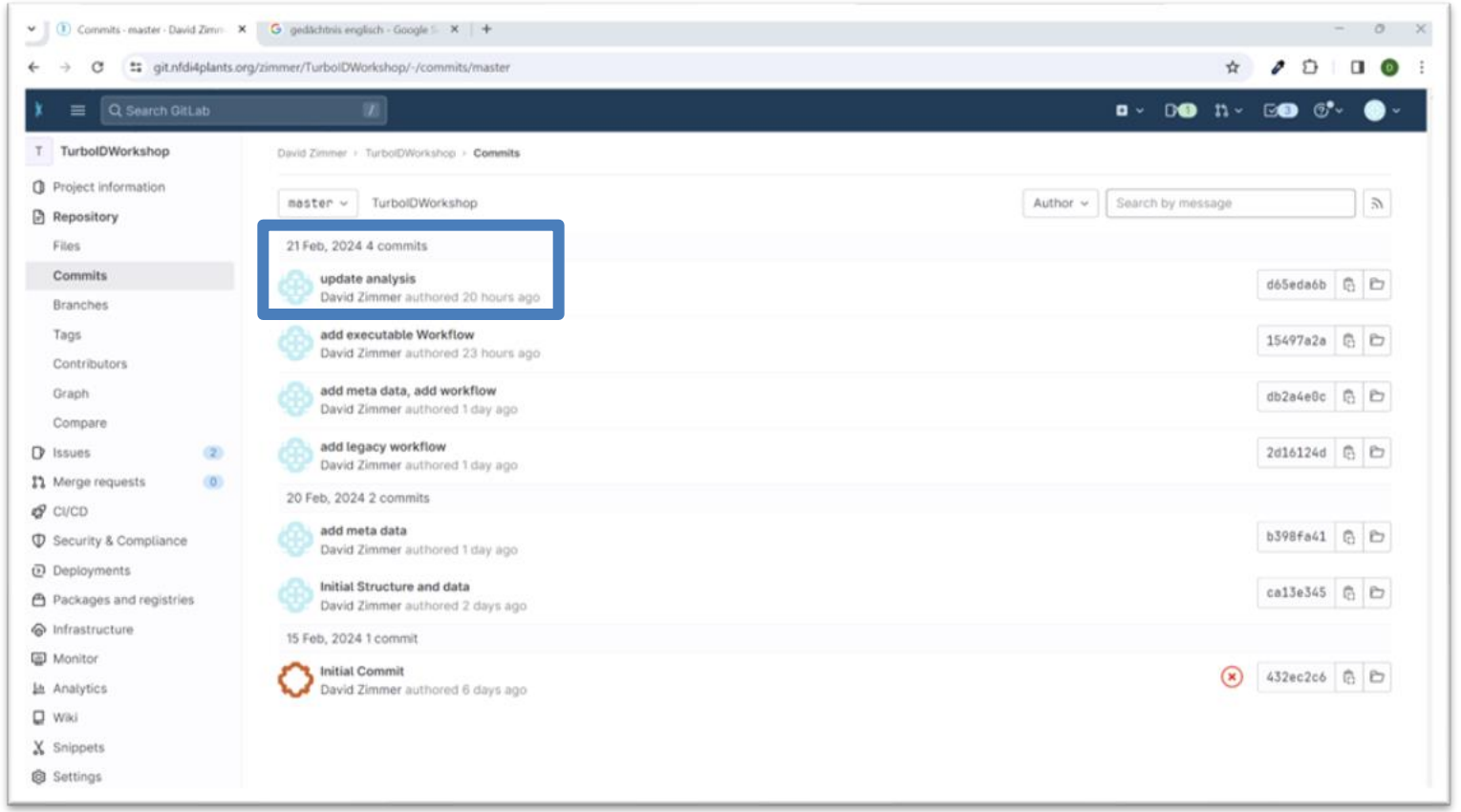
https://doi.org/10.1111/tpj.16474

Now: Using the PLANTDataHUB to collaborate

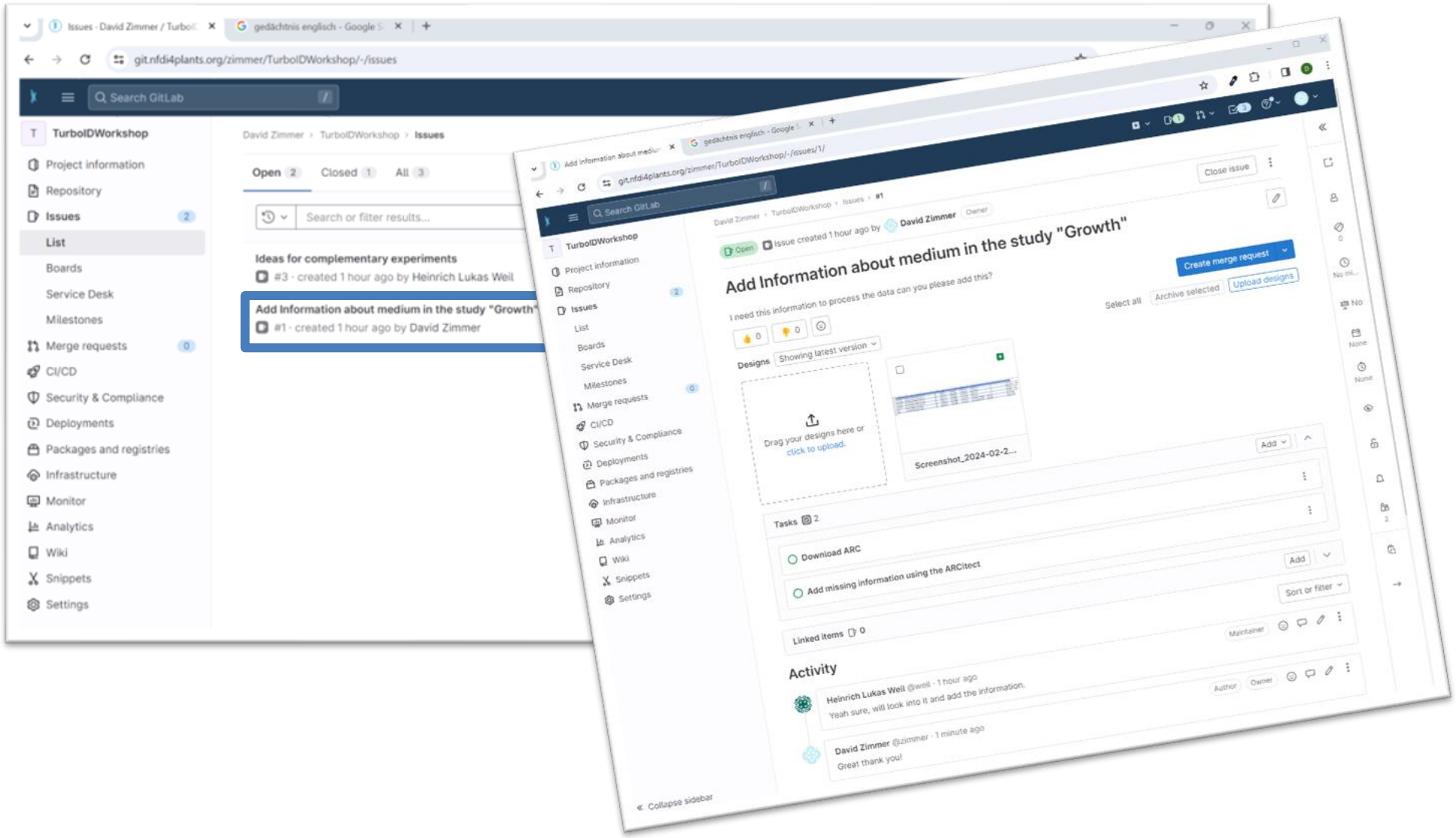


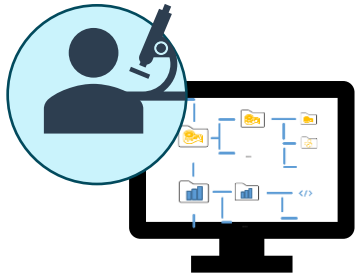


Researcher A

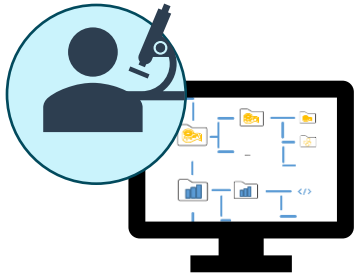


Now: Using the PLANTDataHUB to collaborate





Researcher B



Researcher C

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TRR 175

Work Plan

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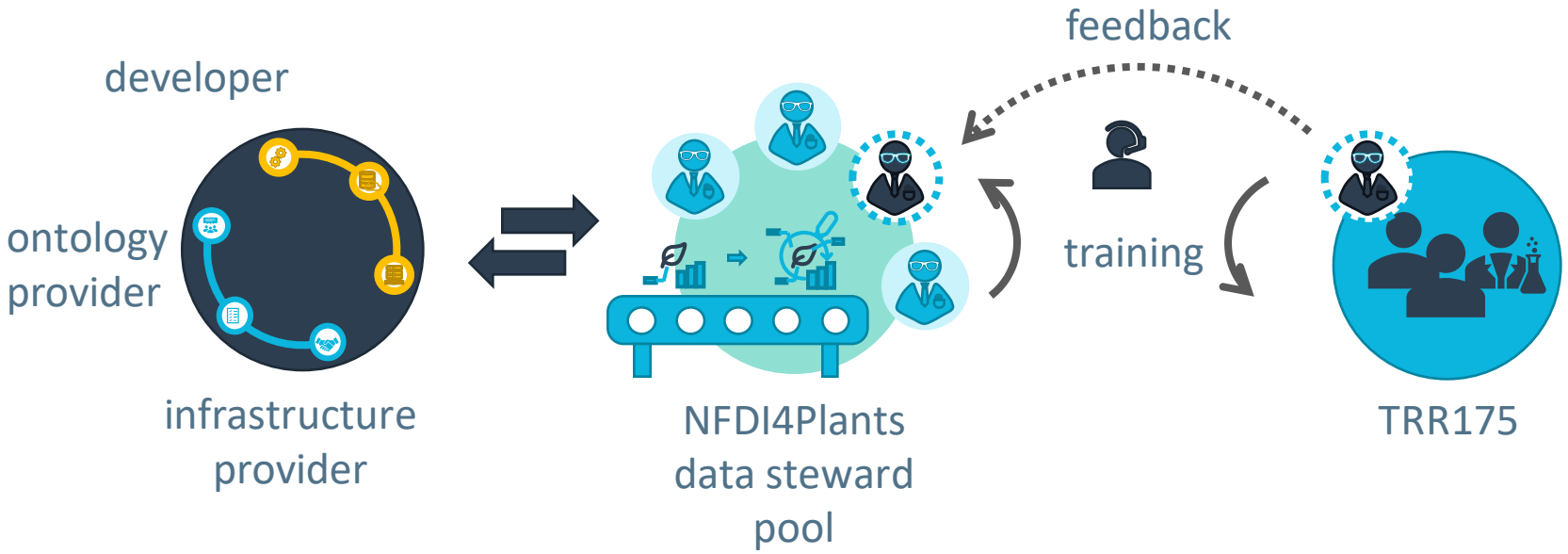
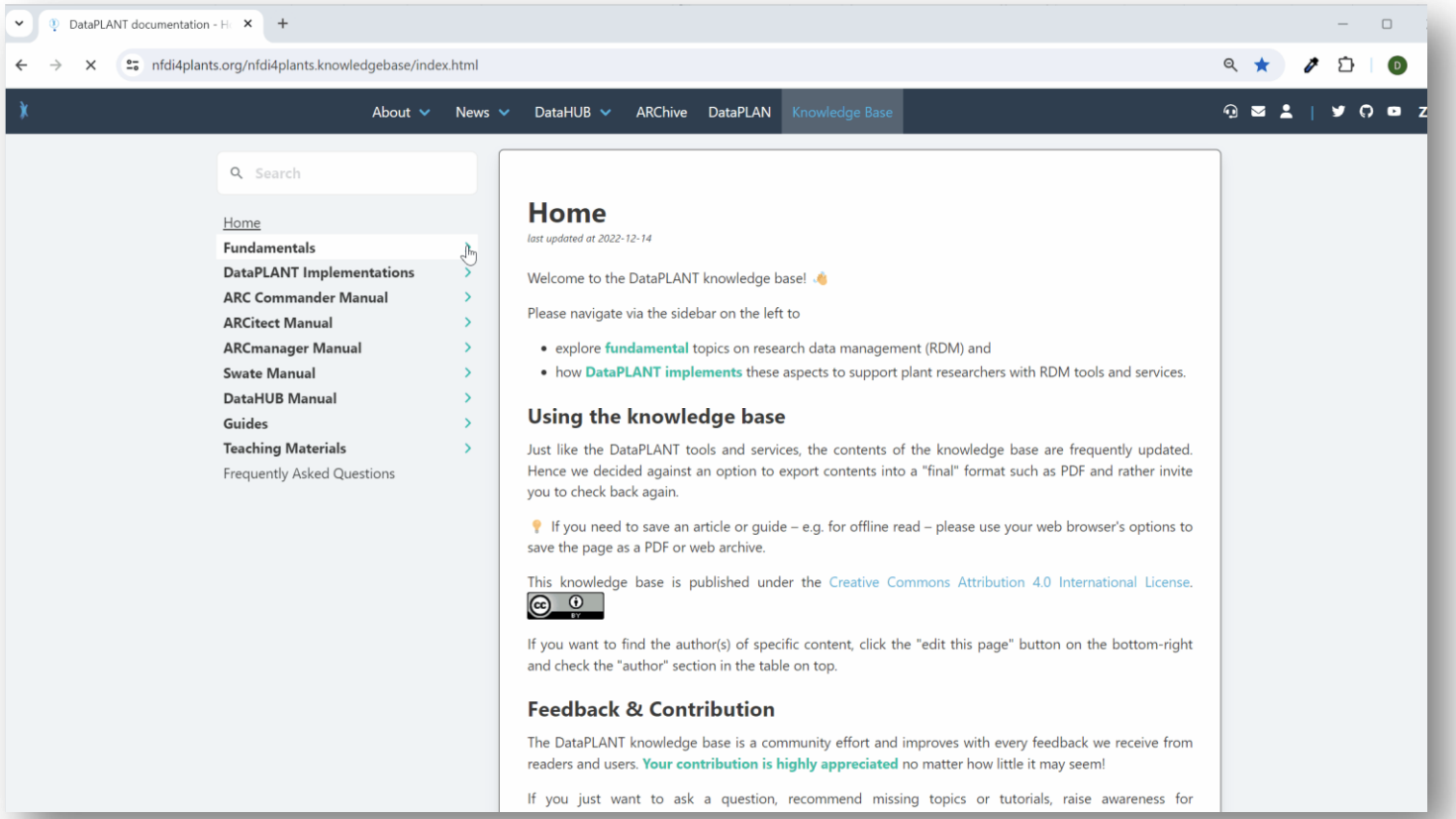
Work plan: Data Stewardship



- Data Stewardship: active support and training of TRR members

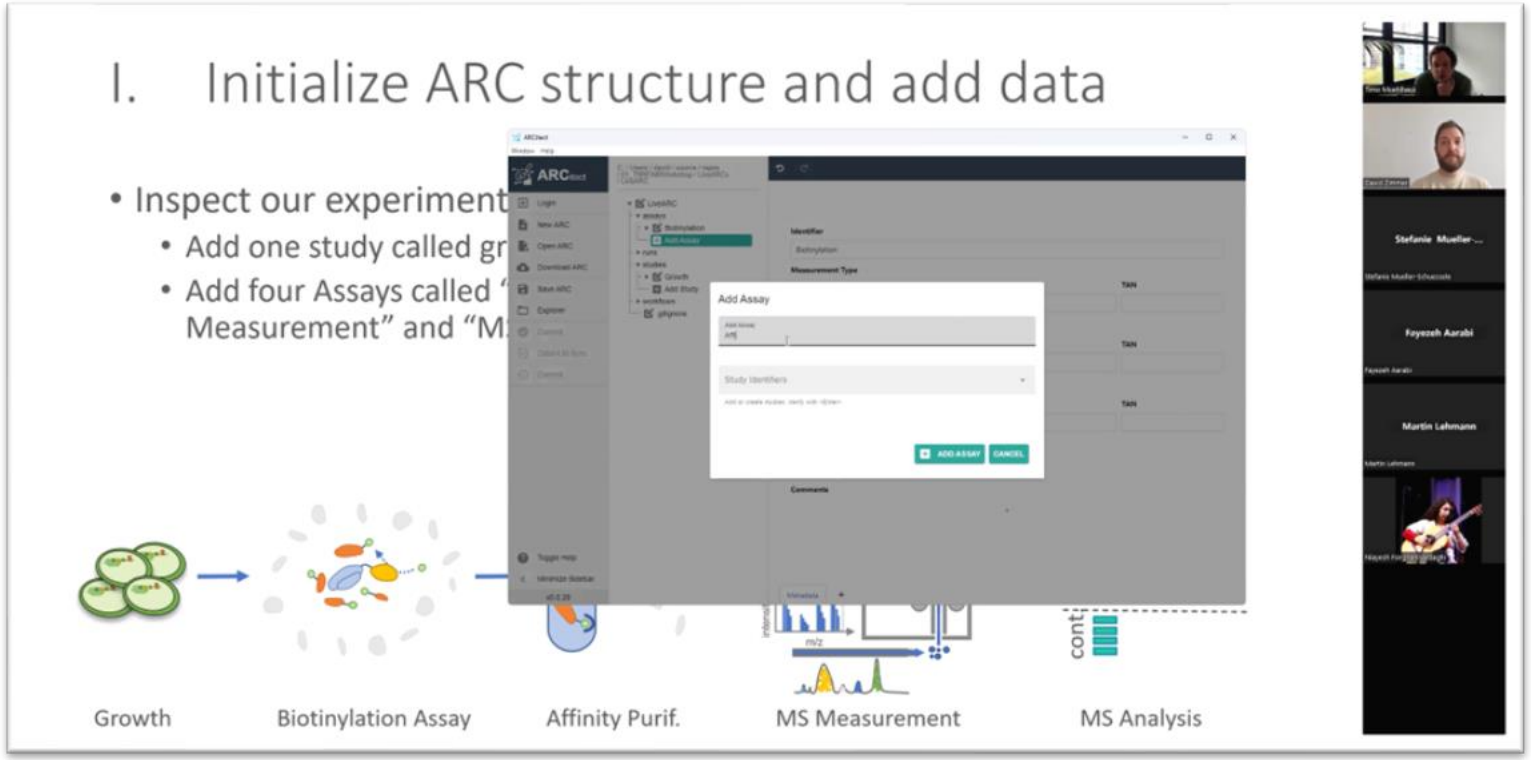
Work plan: Data Stewardship

- **Teaching material** will be continuous contributed to a **publicly available knowledgebase**
- Central **ARCitect** and **SWATE** functionalities are already documented with **video series (>30 videos)**



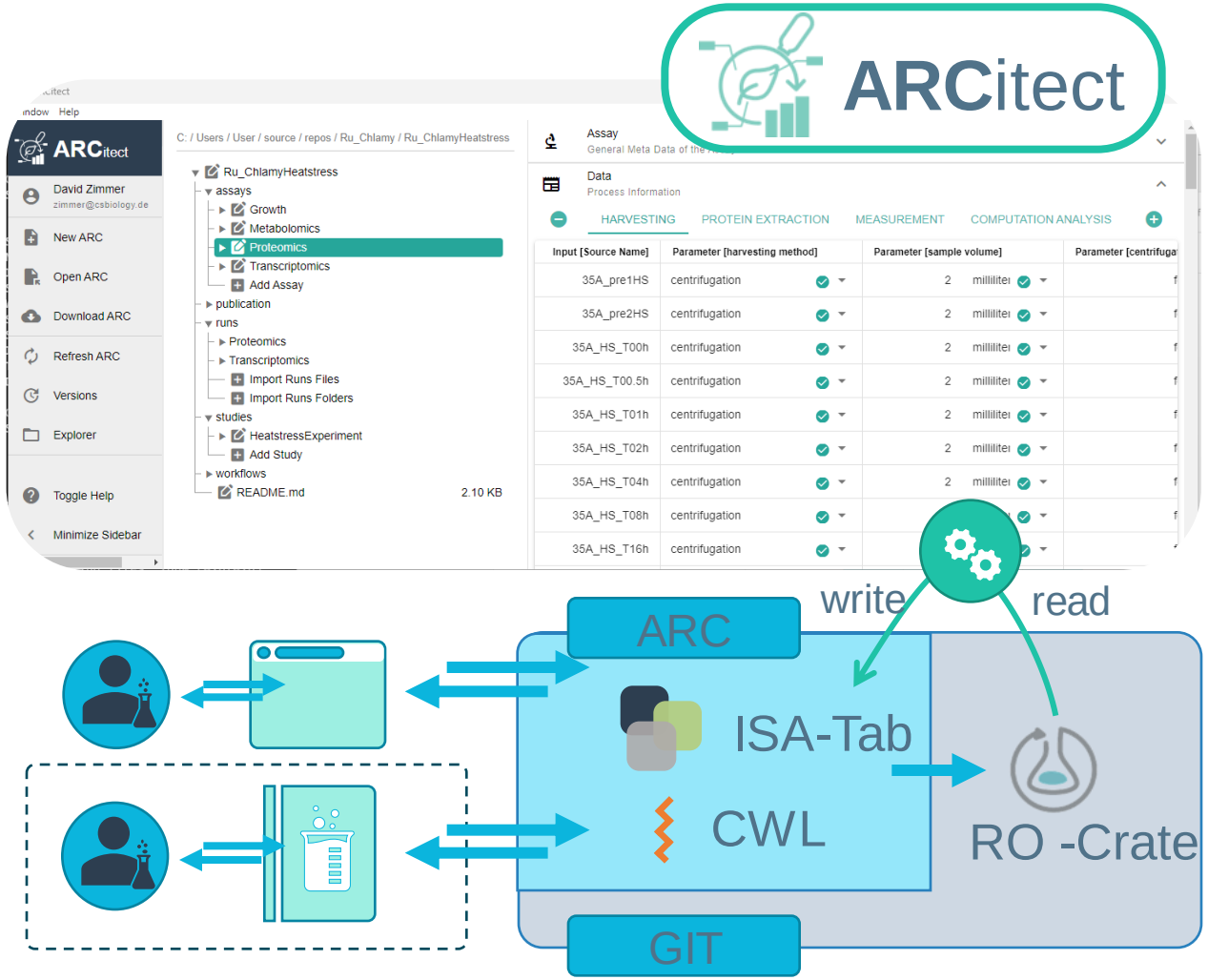
Work plan: Data Stewardship

- Data Stewardship: **active support** and **training** of TRR members
- Research data management **workshops** will be held online as well as on site.



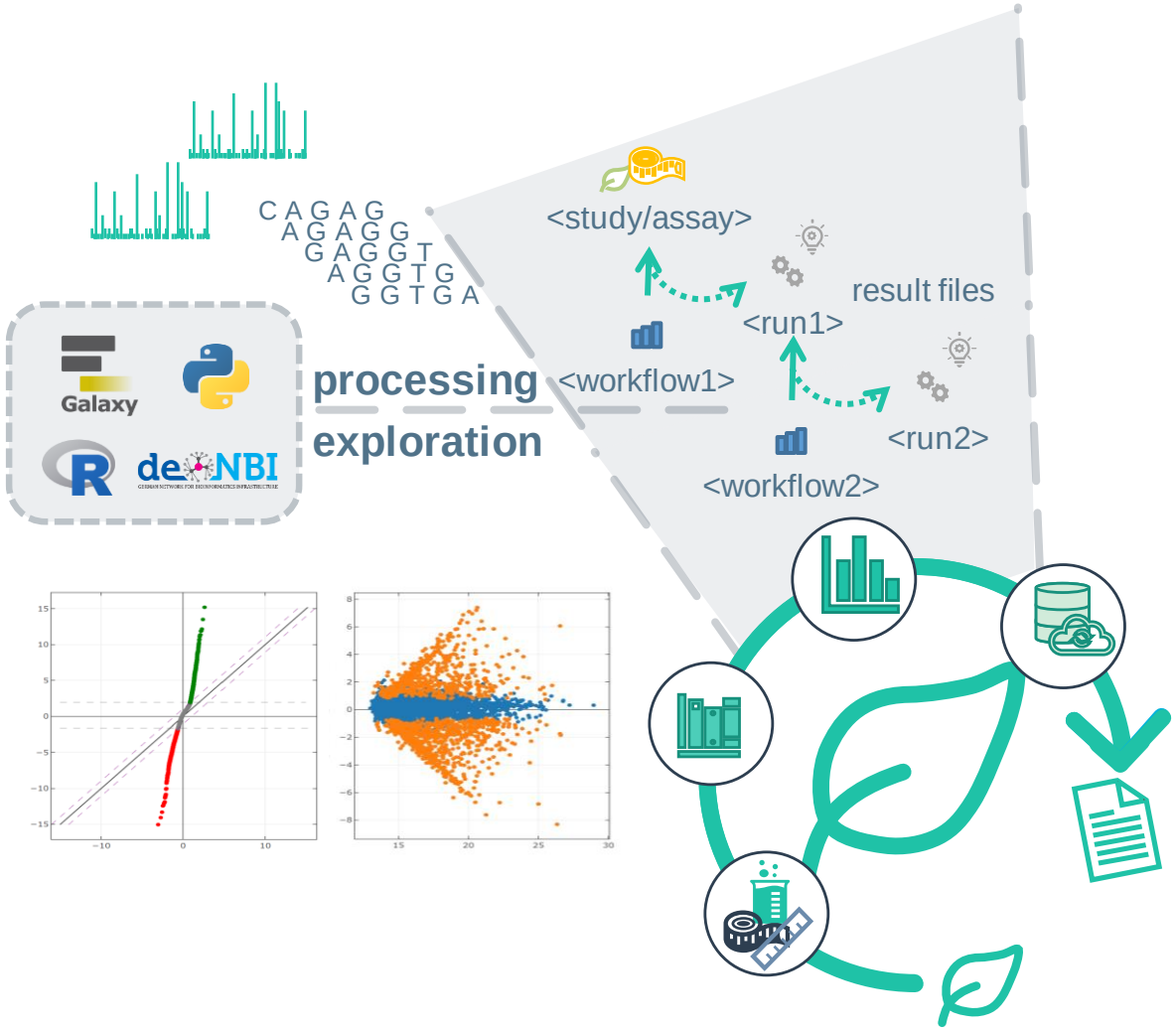
Work plan: Tooling

- **ARCitect** will integrate **SWATE ISA annotation** capabilities with **GIT** functionalities
- Extension of the **ARCitect** with **Electronic Lab Book** capabilities



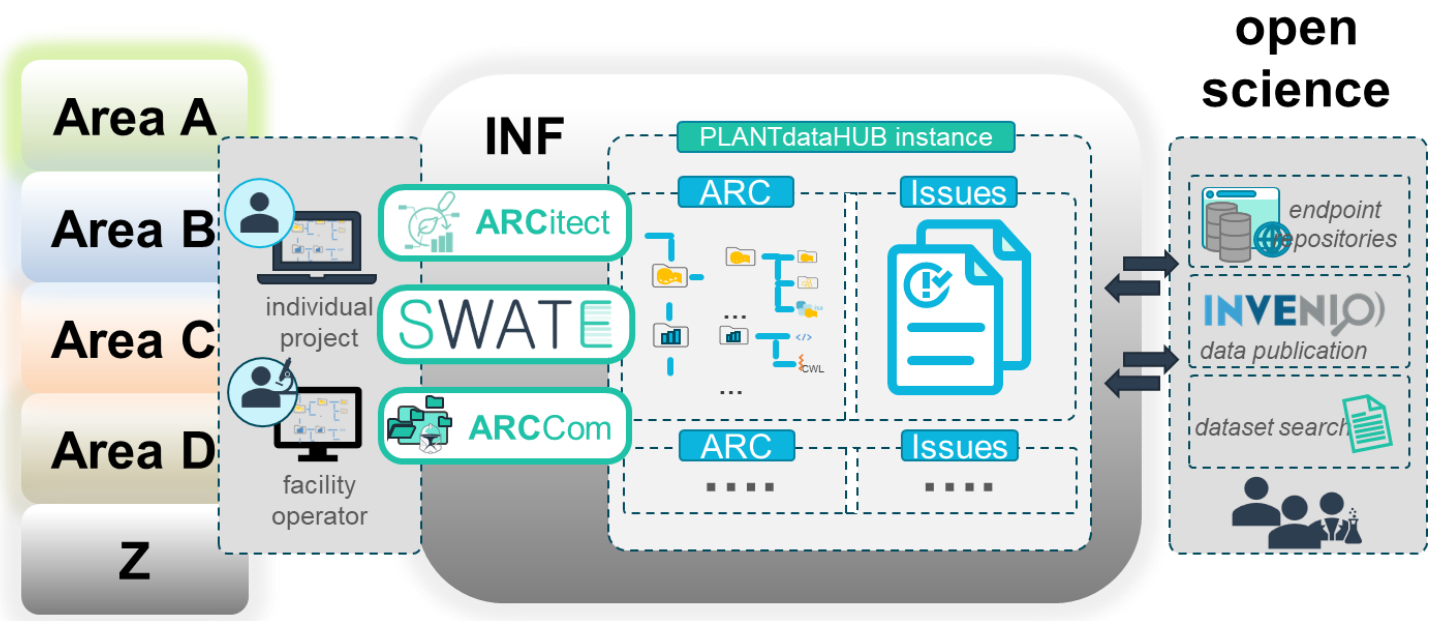
Work plan: FAIR computational workflows

- Utilization of ARCs provides a standardized framework for reusing **FAIR** computational workflows
- Data **processing** and **data exploration** workflows will be developed



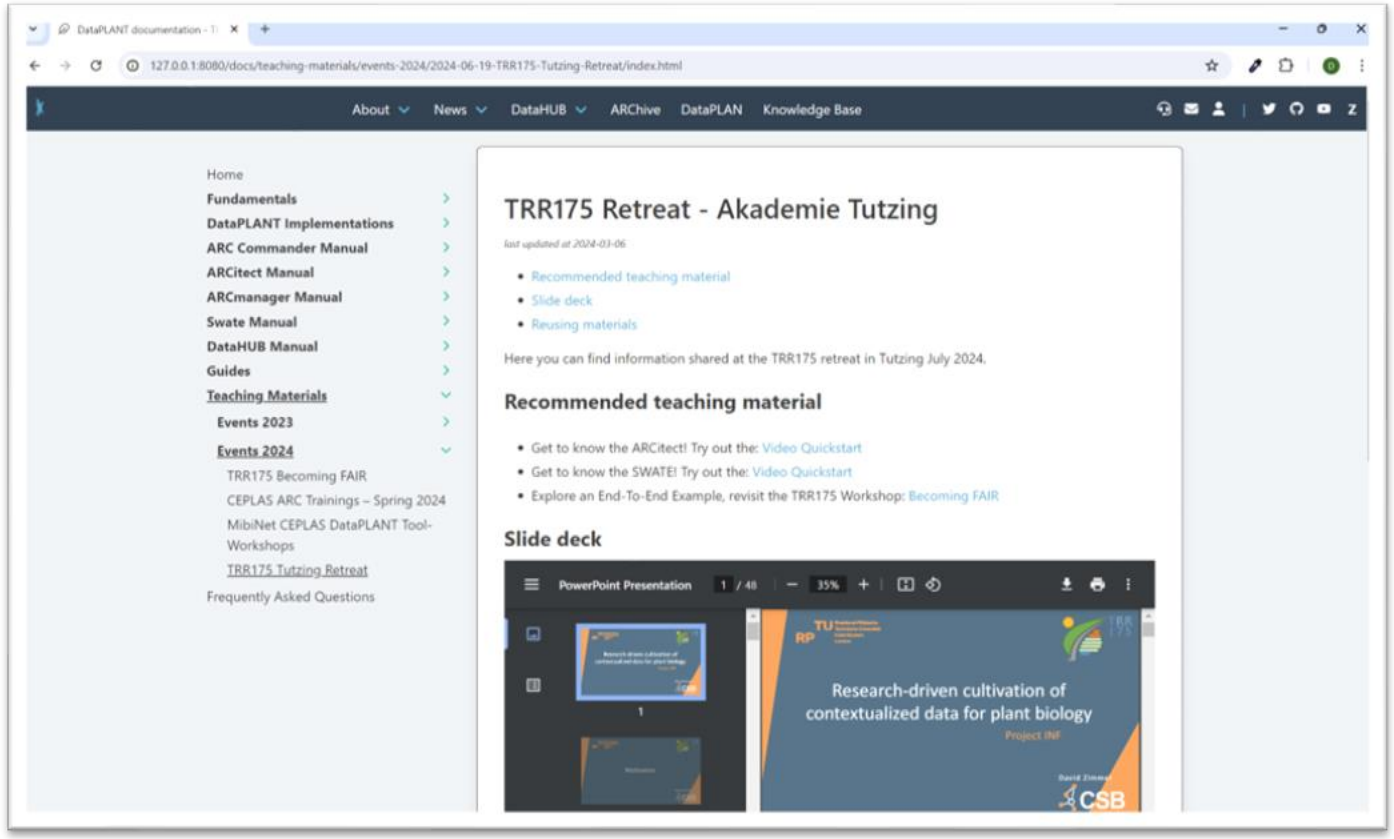
Role within the TRR

- **empower** collaboration within the TRR175
- **enhance** exchange within the TRR175 community and public repositories
- **establish** data integration inside and across communities



TRR175 Resources

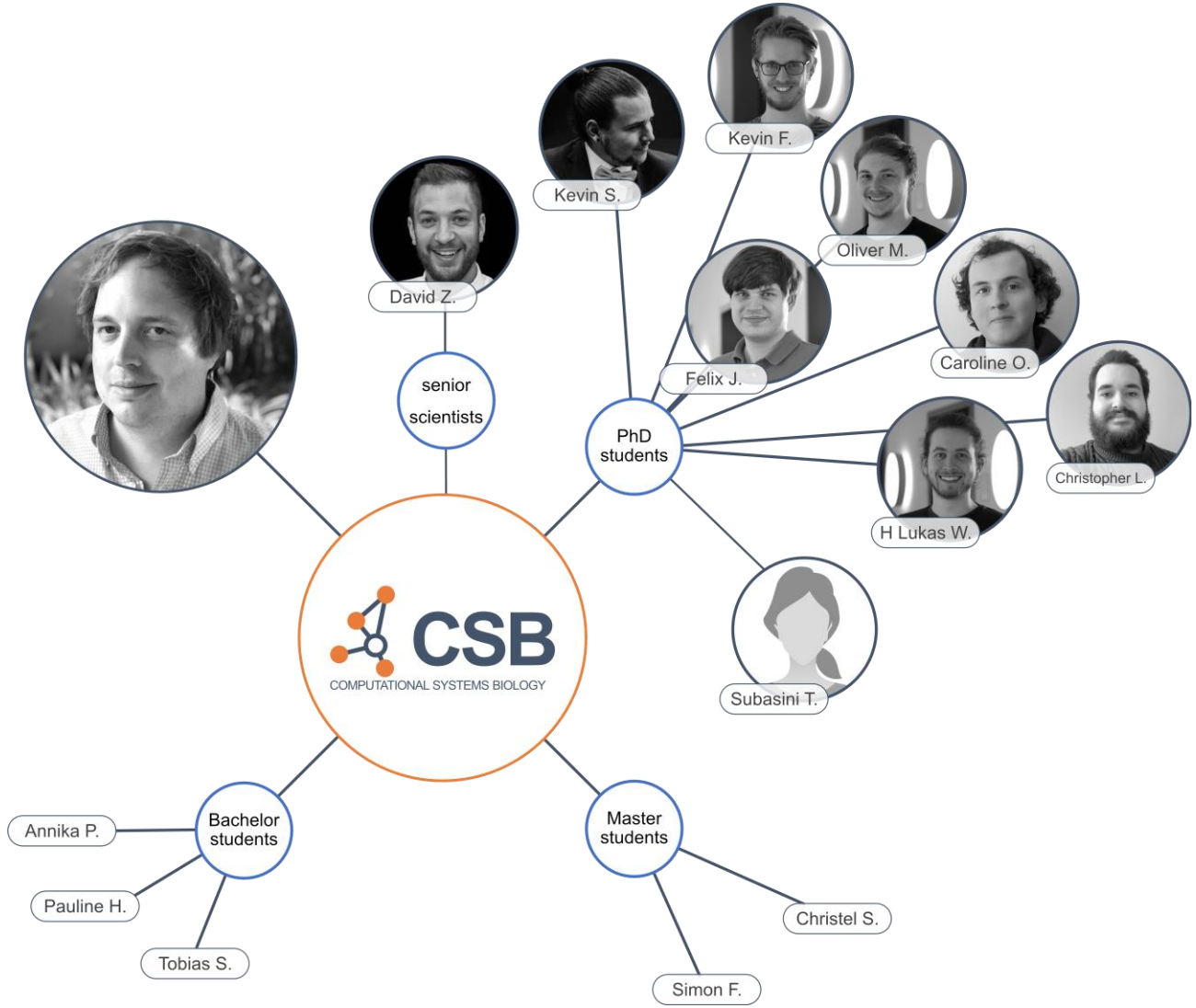
- **TRR175** relevant research data management resources are available via the **NFDI4Plants knowledgebase**



- Checkout: https://nfdi4plants.org/nfdi4plants.knowledgebase

Thank you for your attention!

TRR 175



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TRR 175

Thank you for your attention!

David Zimmer

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Now: Using the PLANTDataHUB to collaborate