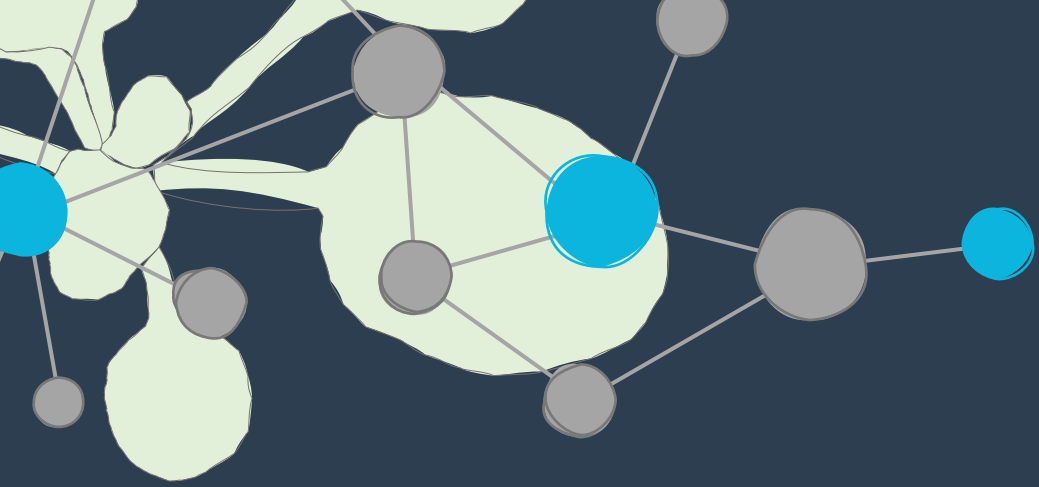
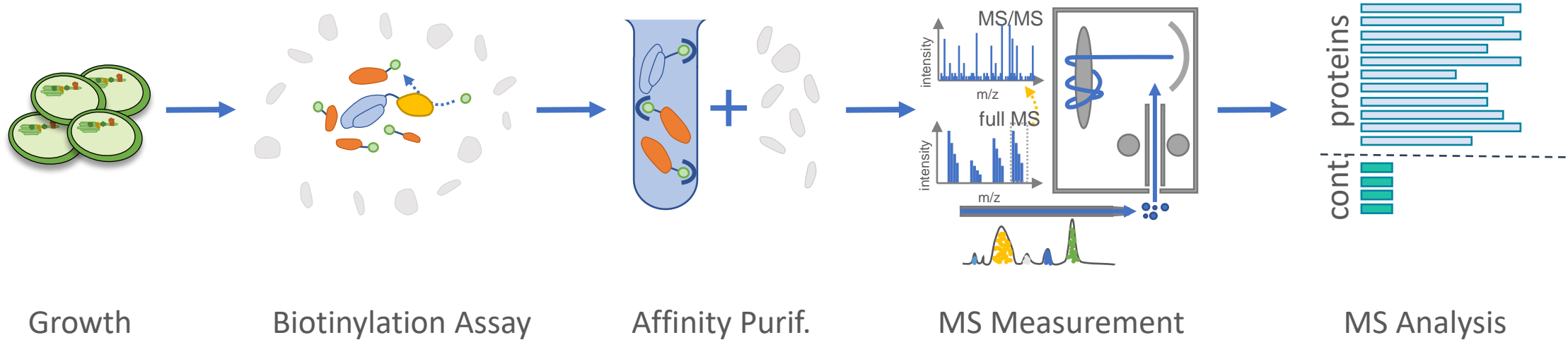


Becoming FAIR: Utilizing ARCs and the PLANTdataHUB for collaborative research in the TRR175



Part two: What is an ARC? A Practical Approach

Motivation: An TurboID experiment

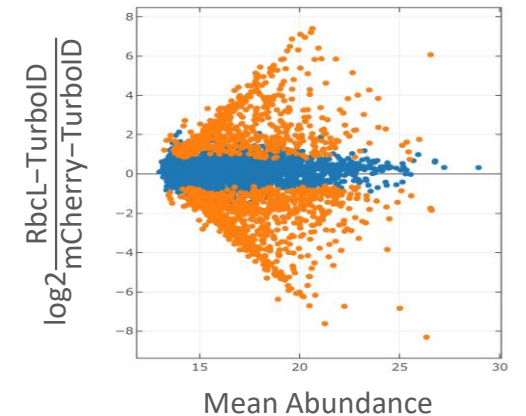
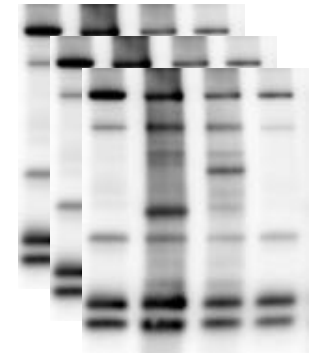
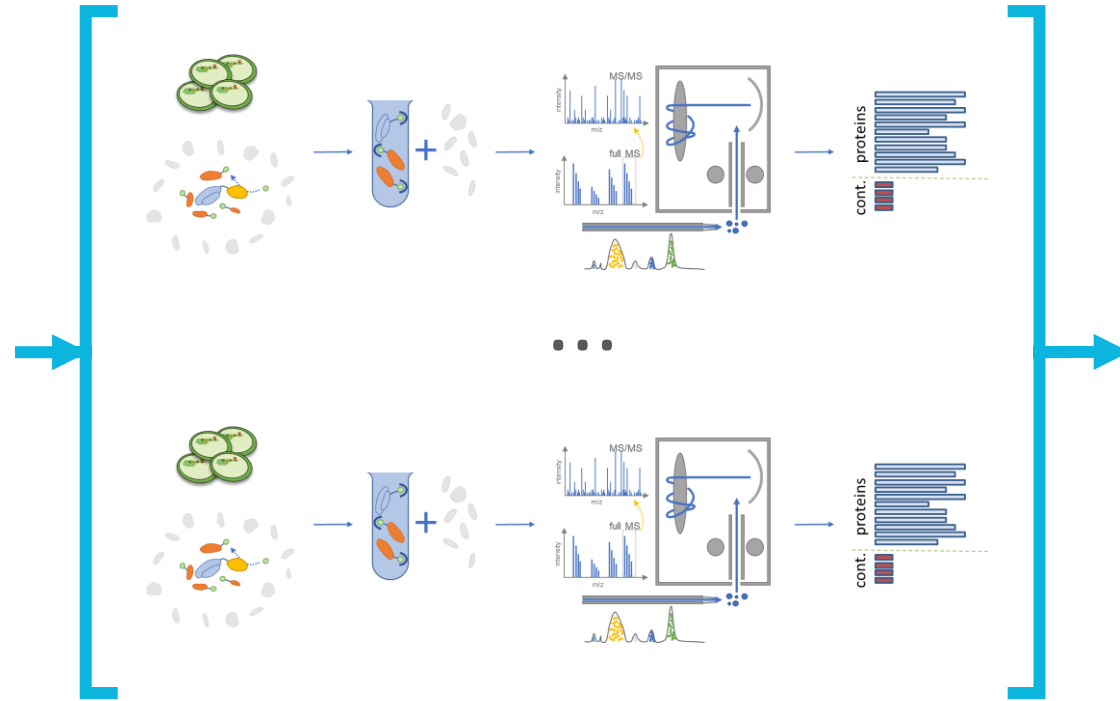


Motivation: An TurboID experiment

Cell type 1,
genetic background 1,
Condition 1
e.g. RbcL-TurboID

...

Cell type n,
genetic background n,
Condition n
e.g. mCherry-TurboID

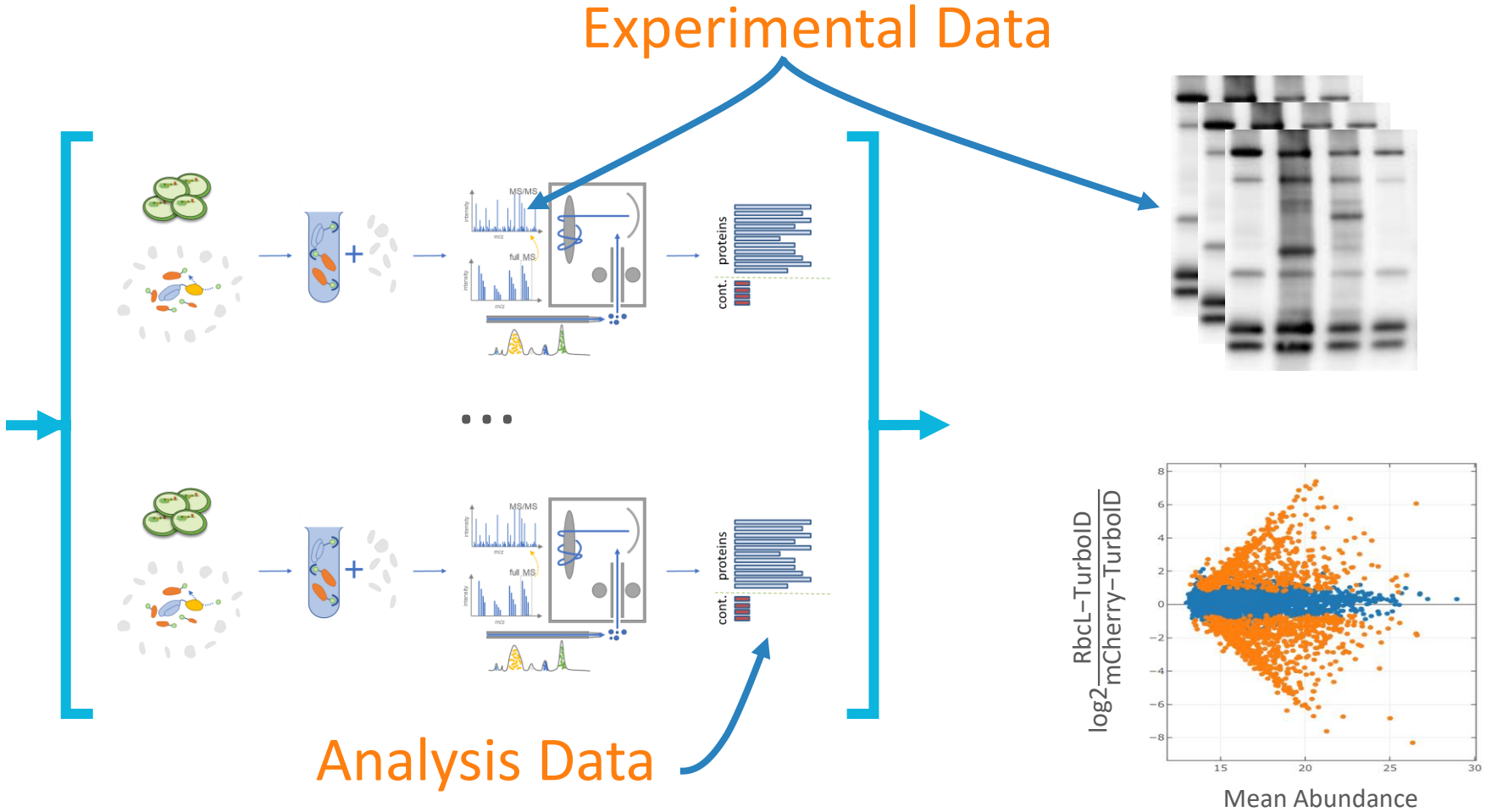


Motivation: An TurboID experiment

Cell type 1,
genetic background 1,
Condition 1
e.g. RbcL-TurboID

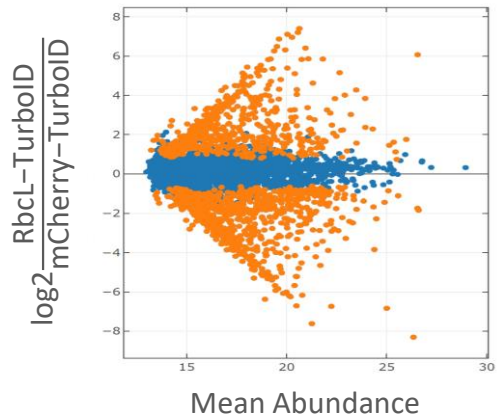
...

Cell type n,
genetic background n,
Condition n
e.g. mCherry-TurboID

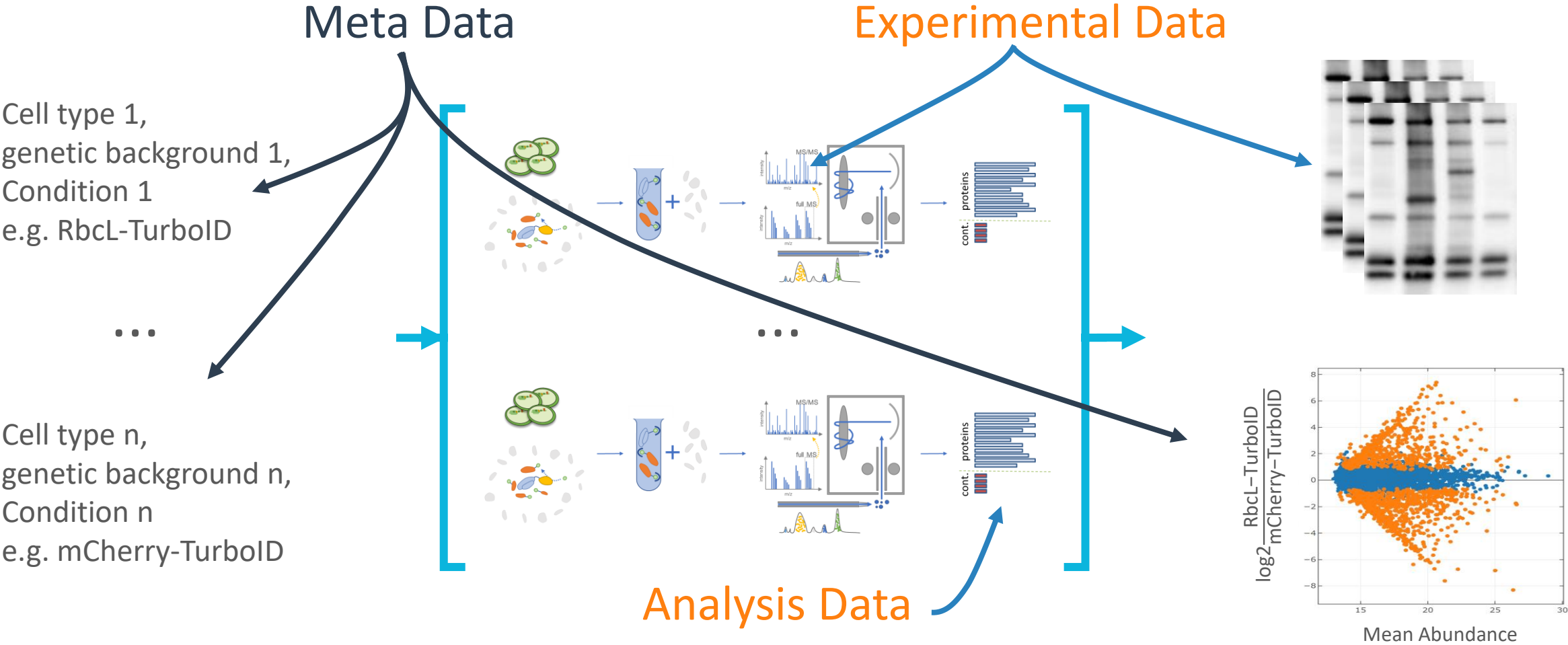


Analysis Data

Experimental Data

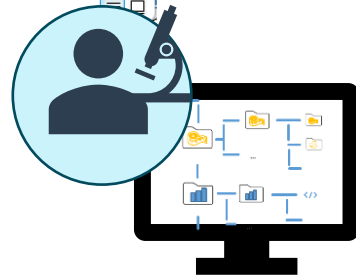
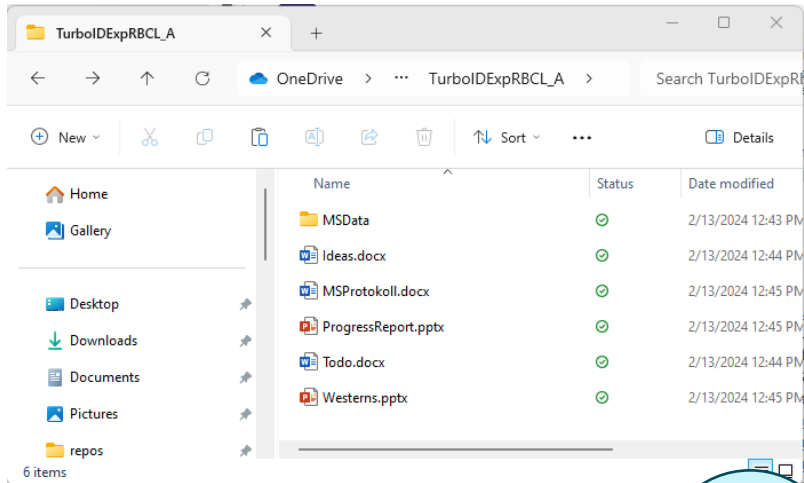


Motivation: An TurboID experiment



Until recently: Individual RDM solutions

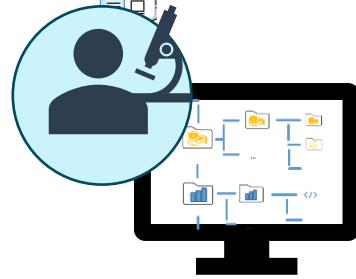
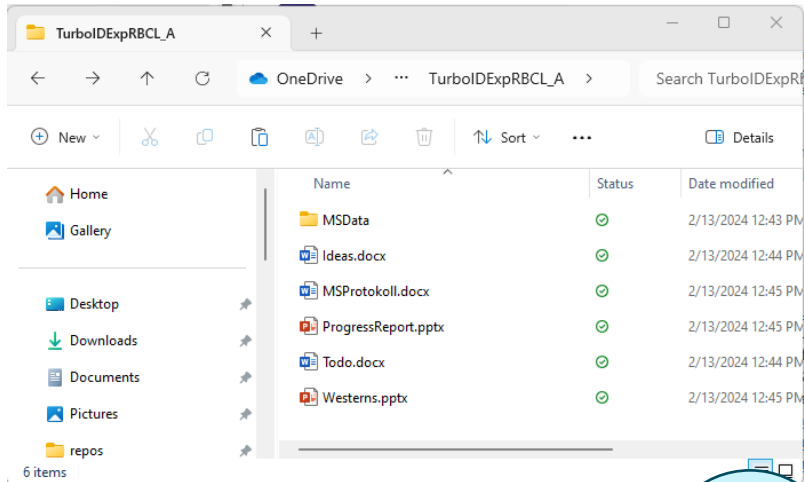
Researcher As data management solution:



Researcher A

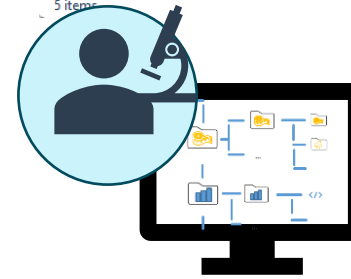
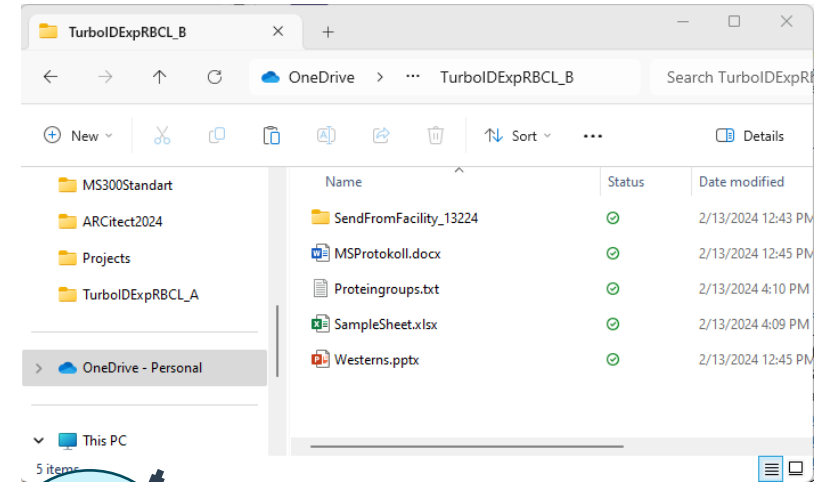
Until recently: Individual RDM solutions

Researcher As data management solution:



Researcher A

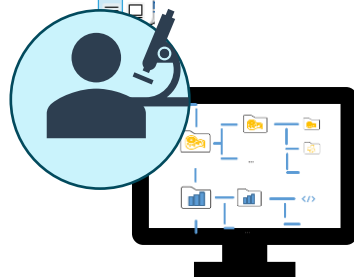
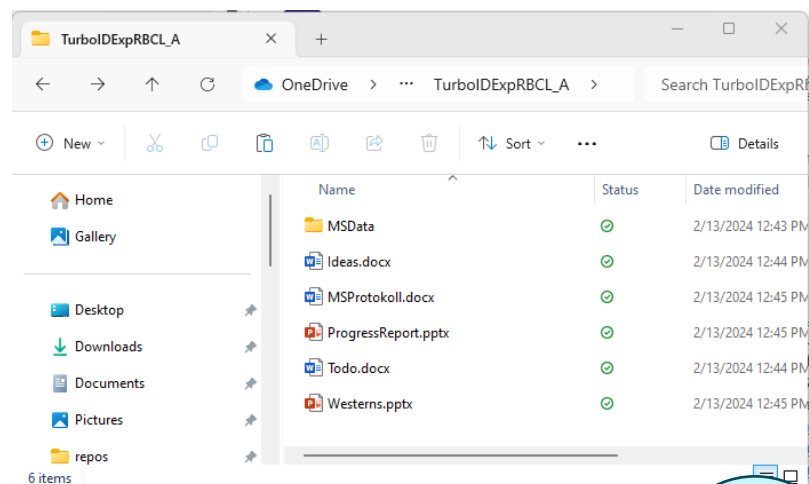
Researcher Bs data management solution:



Researcher B

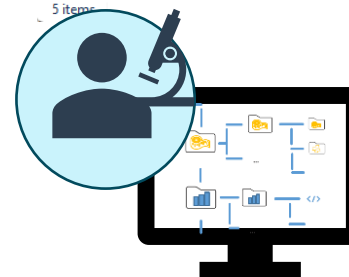
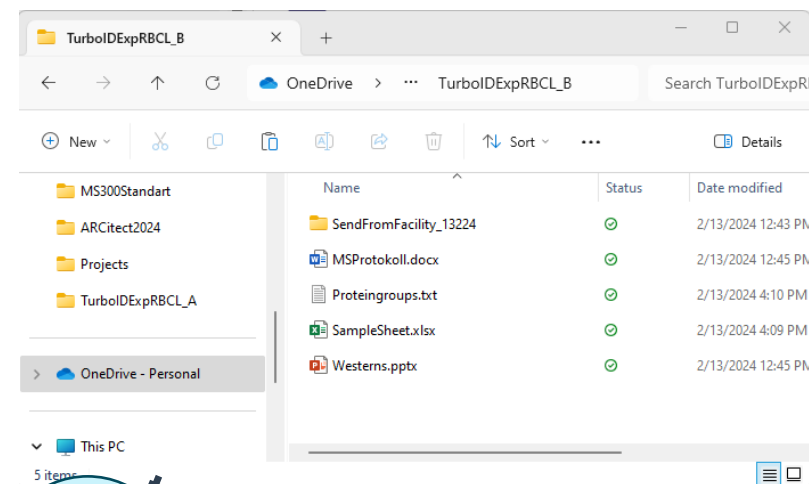
Until recently: Individual RDM solutions

Researcher As data management solution:



Researcher A

Researcher Bs data management solution:

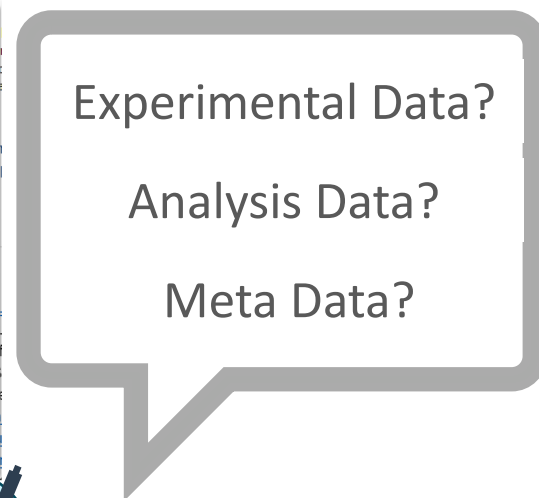
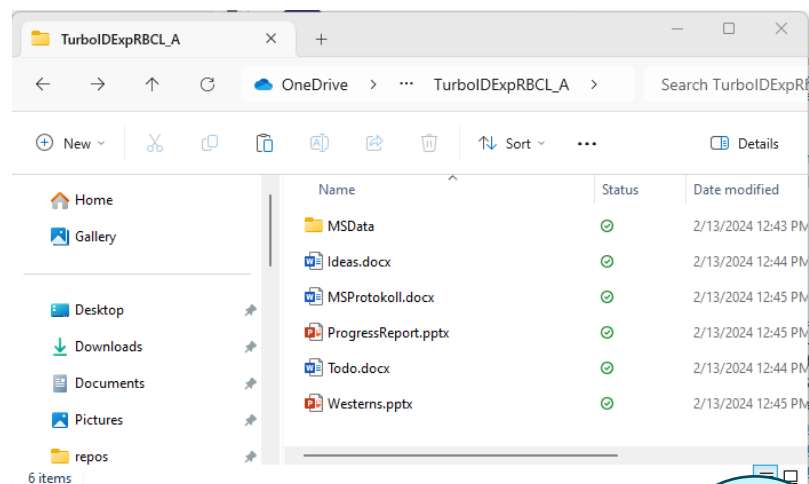


Researcher B



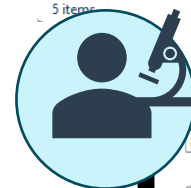
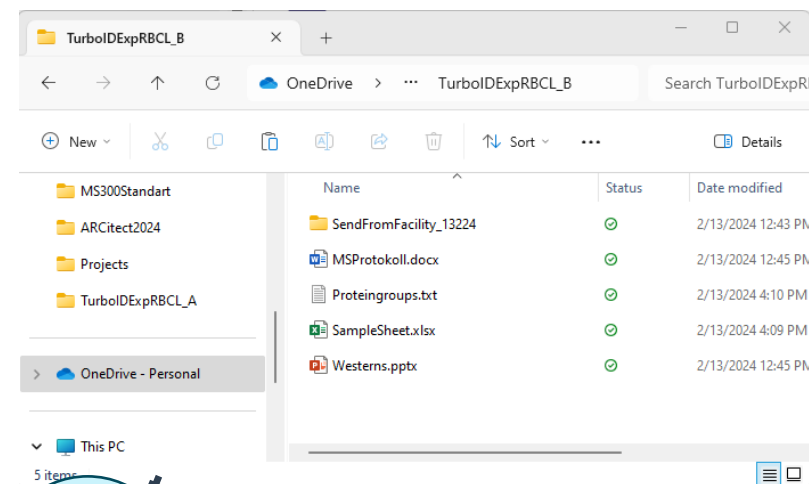
Until recently: Individual RDM solutions

Researcher As data management solution:



Researcher A

Researcher Bs data management solution:

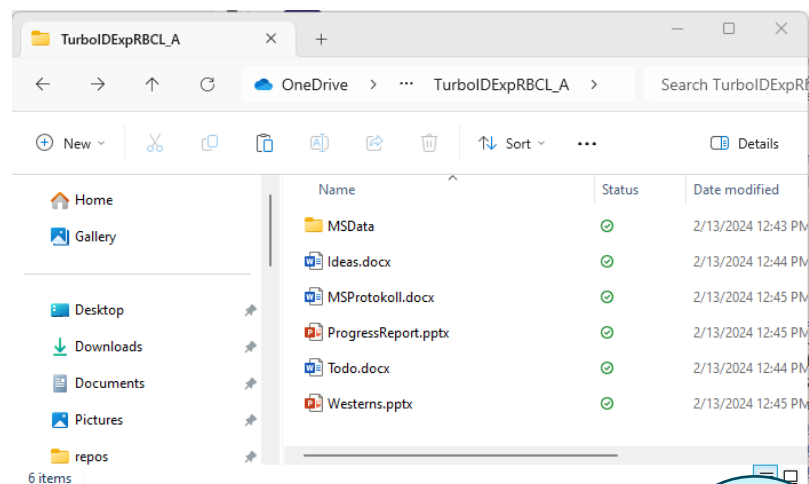


Researcher B

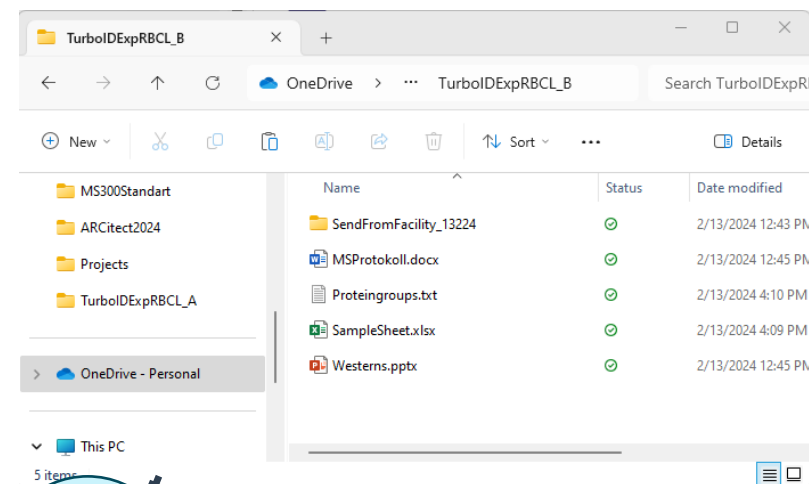


Until recently: Individual RDM solutions

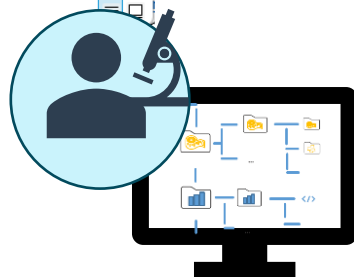
Researcher As data management solution:



Researcher Bs data management solution:

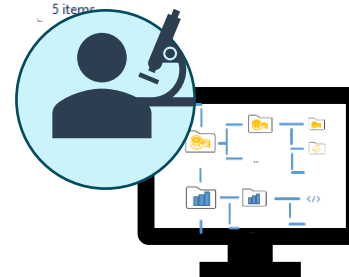


How do we exchange data?
More Metadata?
Any Updates?



Researcher A

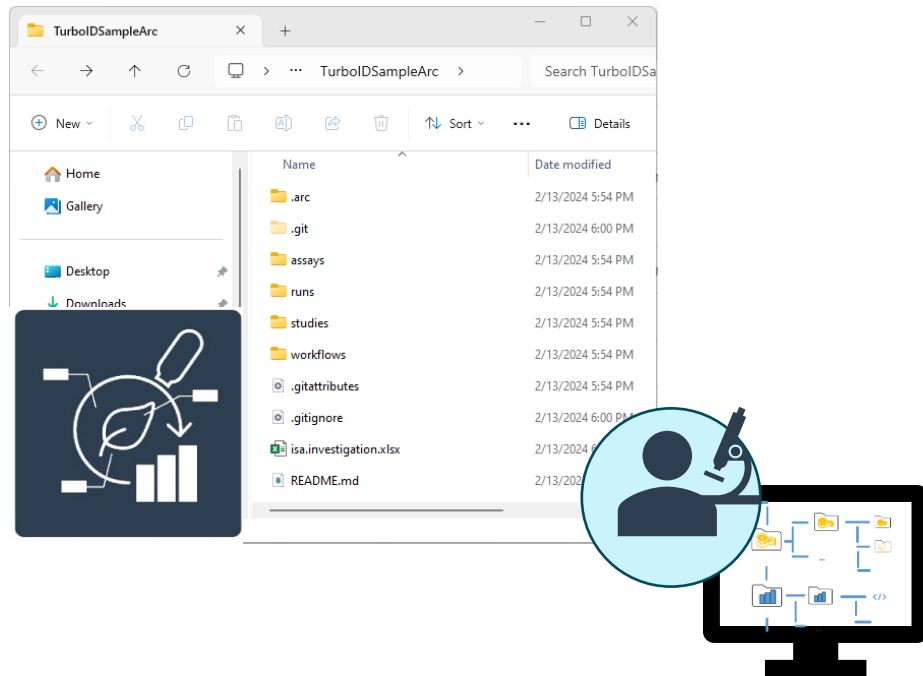
← Collaboration →



Researcher B

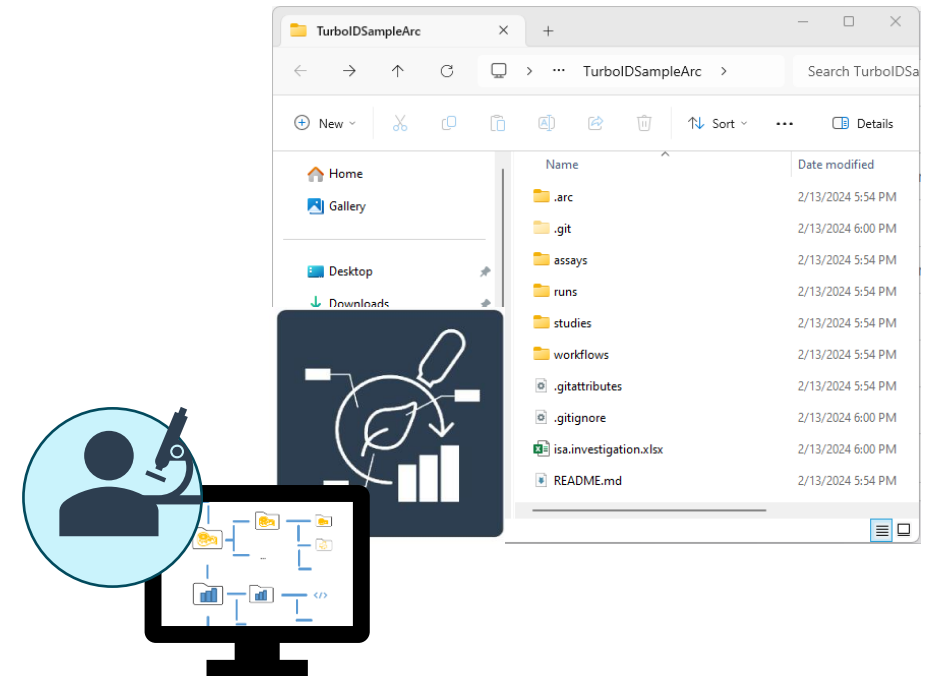
Now: ARCs as a single RDM entry point

Researcher A's data management solution:
Annotated Research Context (ARC)



Researcher A

Researcher B's data management solution:
Annotated Research Context (ARC)

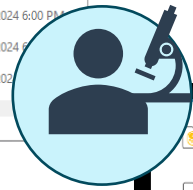
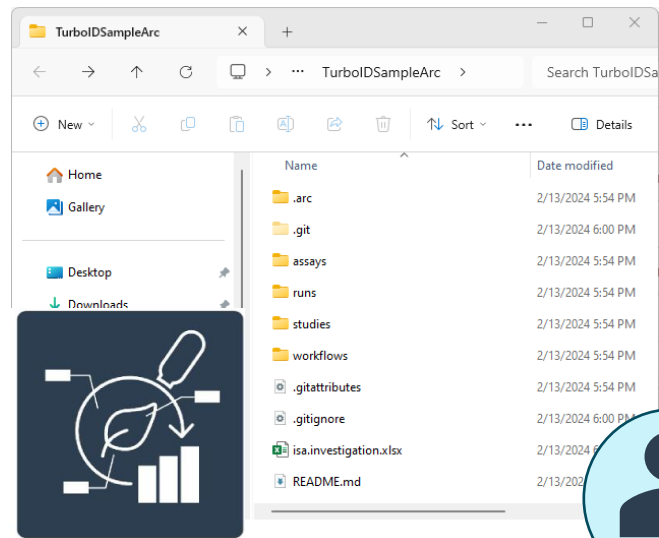


Researcher B

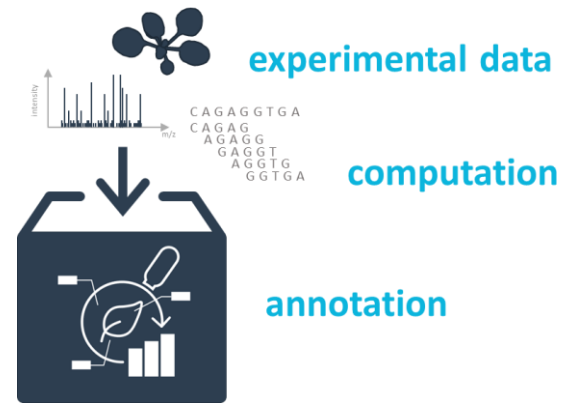
Collaboration

Now: ARCs as a single RDM entry point

Researcher A's data management solution:
Annotated Research Context (ARC)

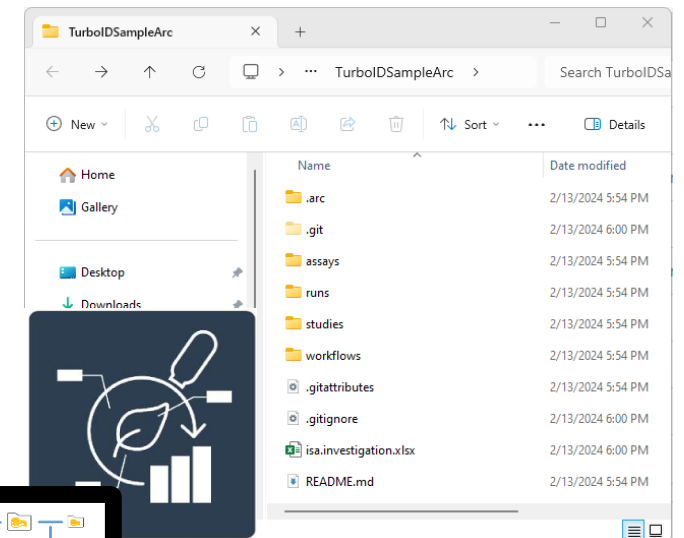


Researcher A



Collaboration

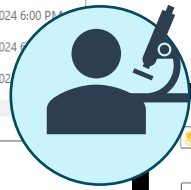
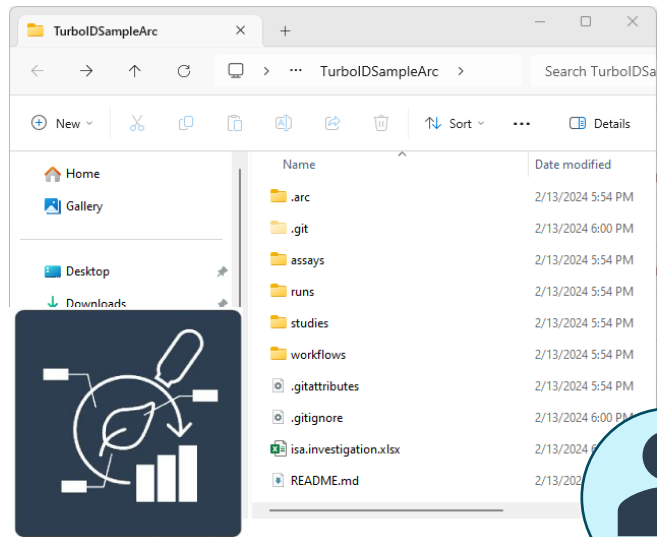
Researcher B's data management solution:
Annotated Research Context (ARC)



Researcher B

Now: ARCs as a single RDM entry point

Researcher A's data management solution:
Annotated Research Context (ARC)

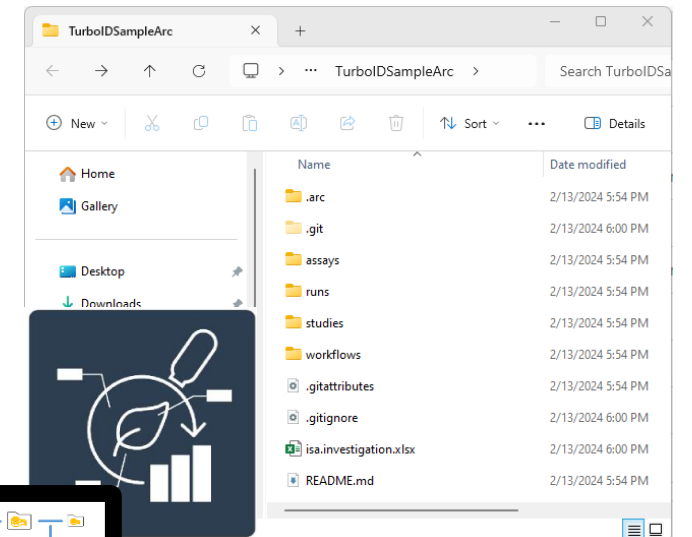


Researcher A

Experimental Data? ✓
Analysis Data? ✓
Meta Data? ✓

← Collaboration →

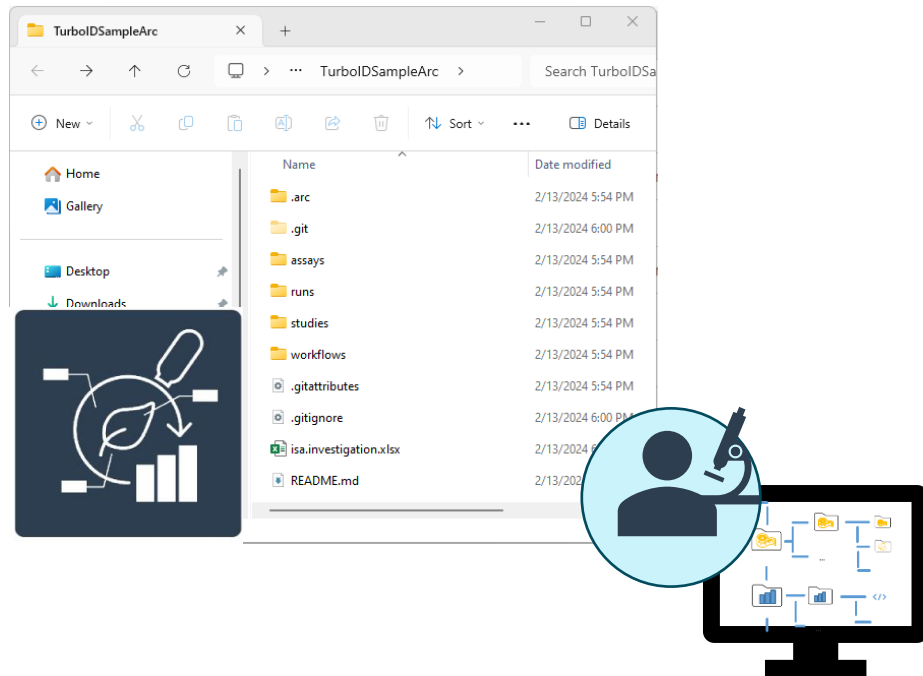
Researcher B's data management solution:
Annotated Research Context (ARC)



Researcher B

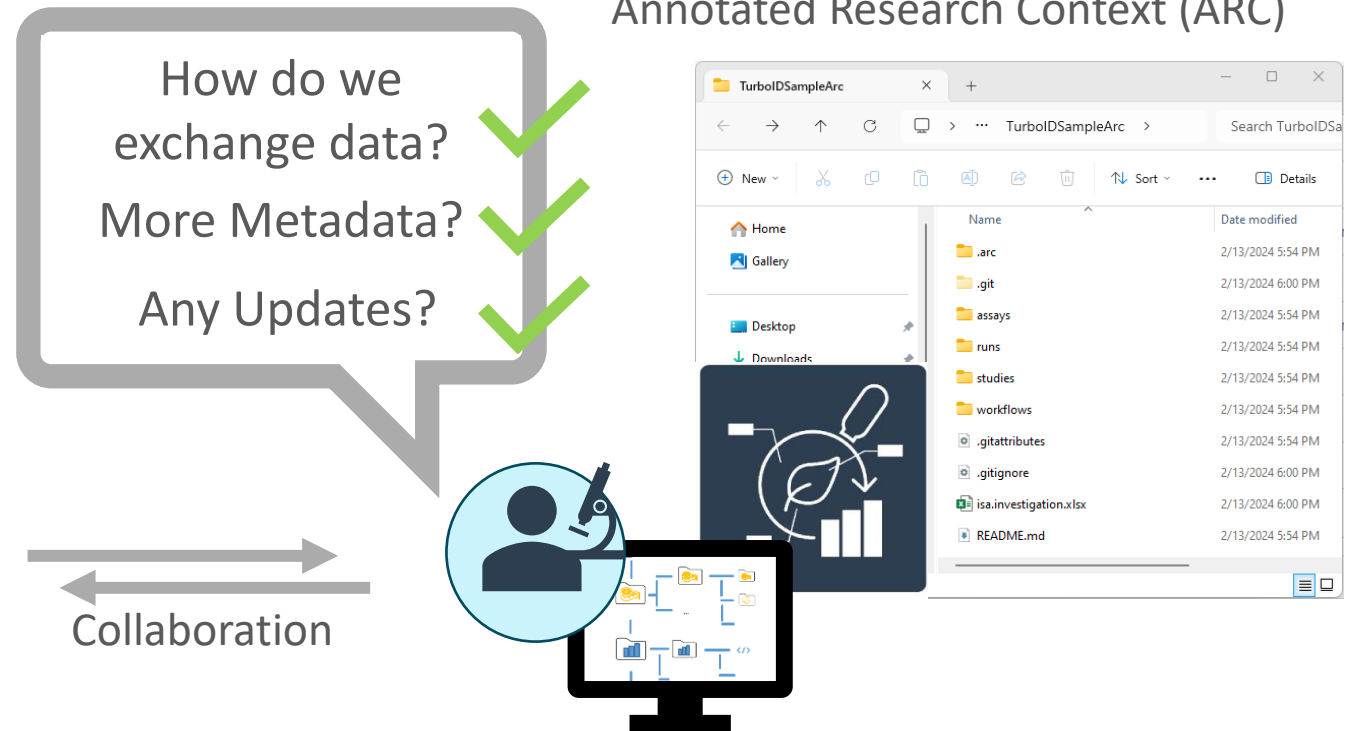
Now: Using the PLANTDataHUB to collaborate

Researcher A's data management solution:
Annotated Research Context (ARC)

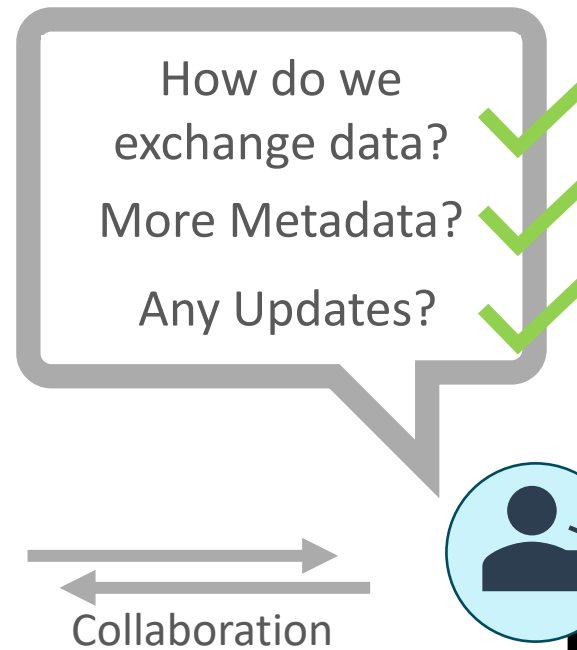


Researcher A

Researcher B's data management solution:
Annotated Research Context (ARC)



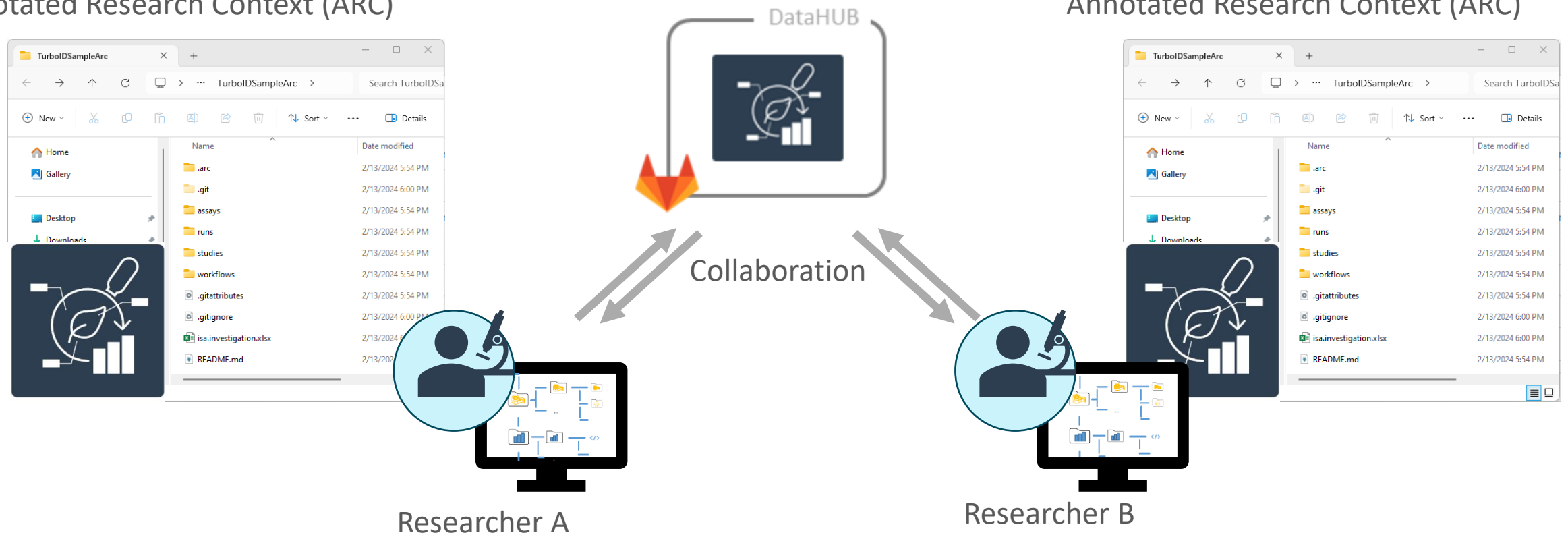
Researcher B



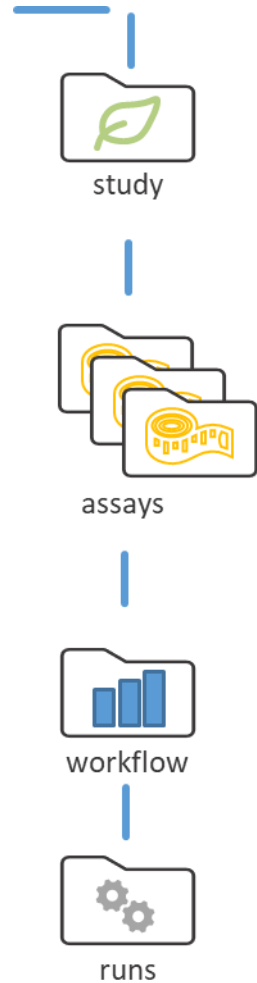
Now: Using the PLANTDataHUB to collaborate

Researcher A's data management solution:
Annotated Research Context (ARC)

Researcher B's data management solution:
Annotated Research Context (ARC)



Agenda of part two

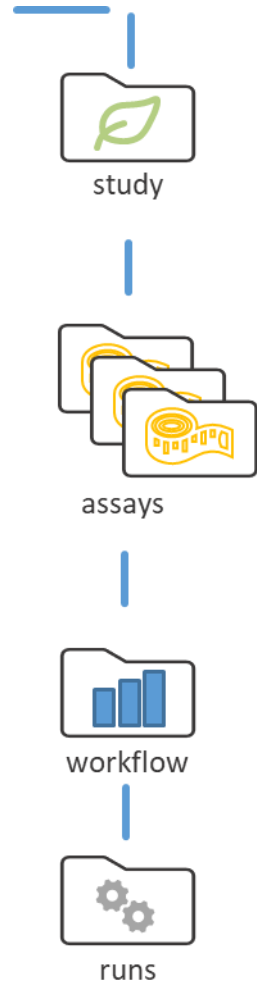


- I. Important ARC concepts by example: Structure and Data
- II. Important ARC concepts by example: Meta Data Annotation Principle
- III. ARCs for FAIR collaboration using the PLANTDataHUB



IV. Complete Walk-Through using the ARCitect

Agenda of part two

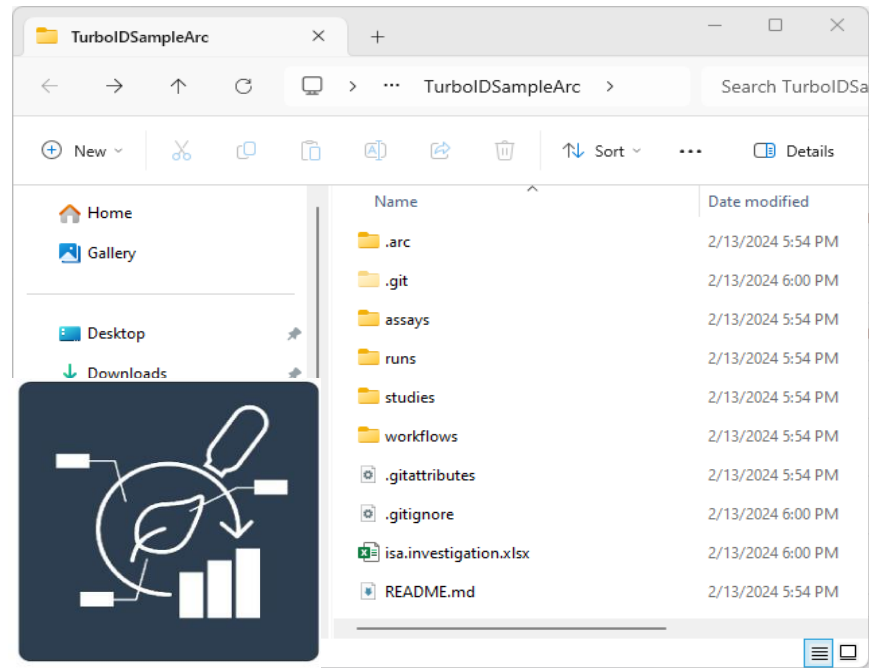
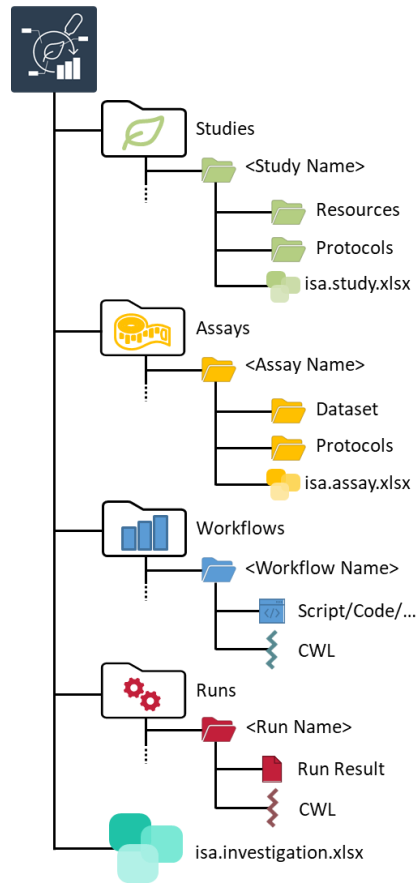


- I. Important ARC concepts by example: Structure and Data
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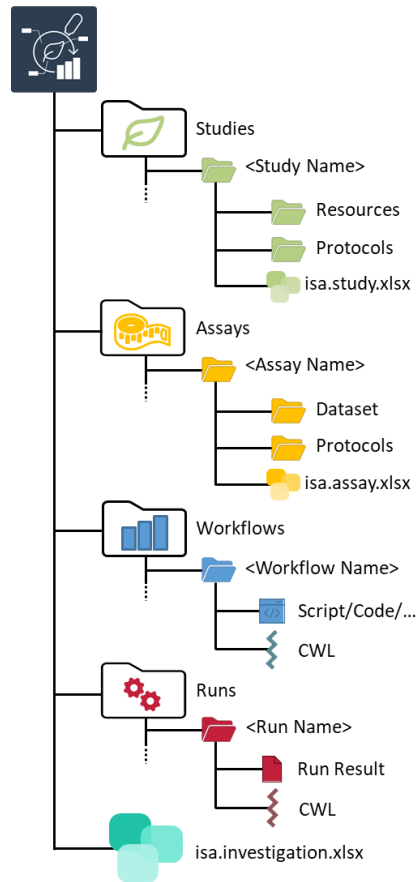


IV. Complete Walk-Through using the ARCitect

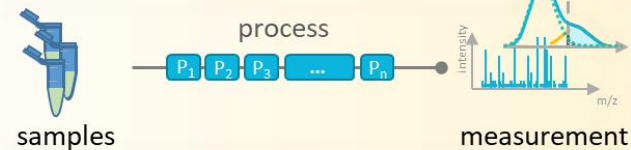
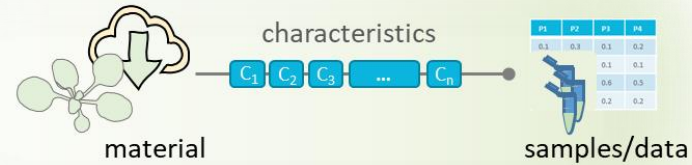
Important ARC Concepts: Structure and Data



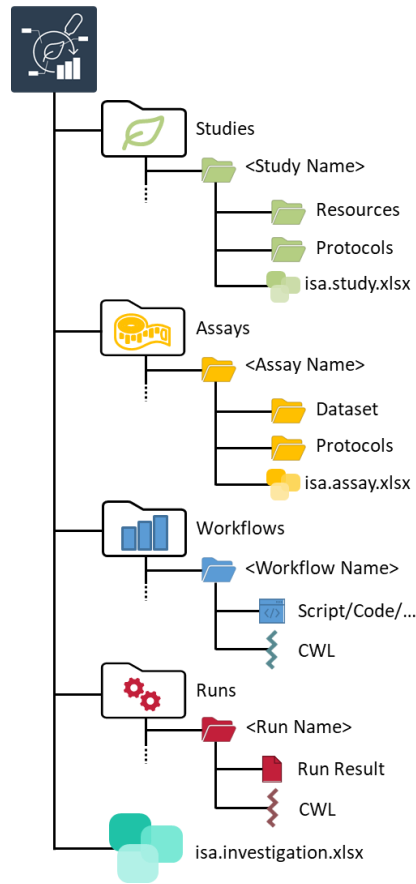
Important ARC Concepts: Structure and Data



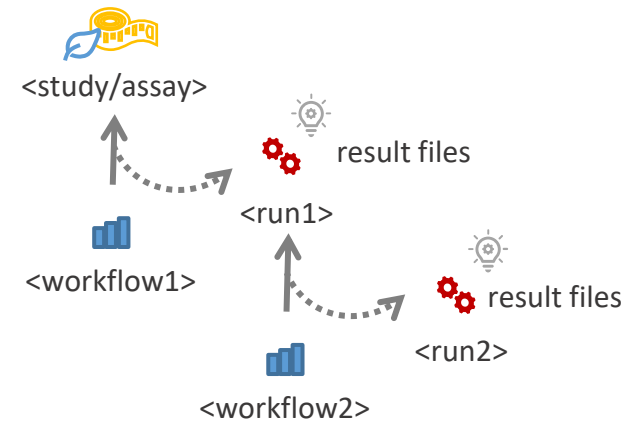
**Experimental
Data and
Meta Data**



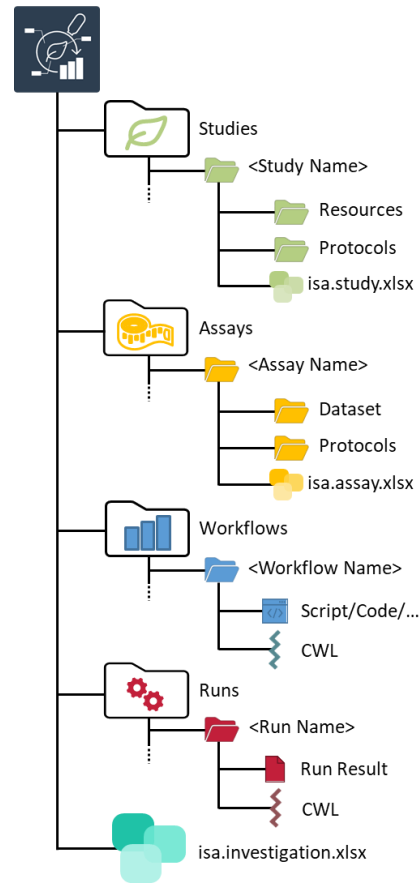
Important ARC Concepts: Structure and Data



← Computational Data and Meta Data →



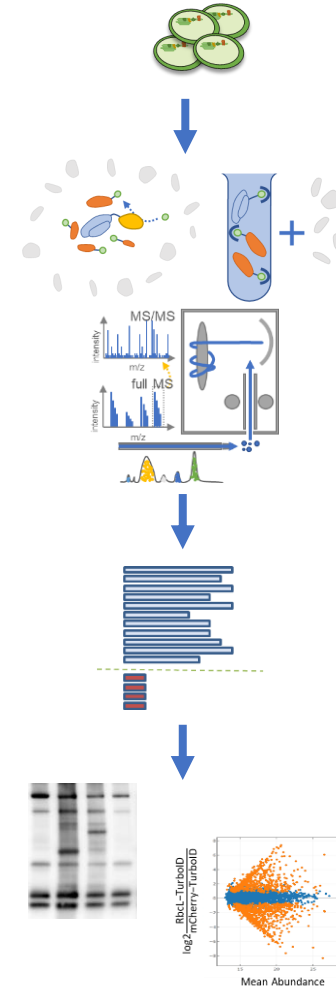
Important ARC Concepts: Structure and Data



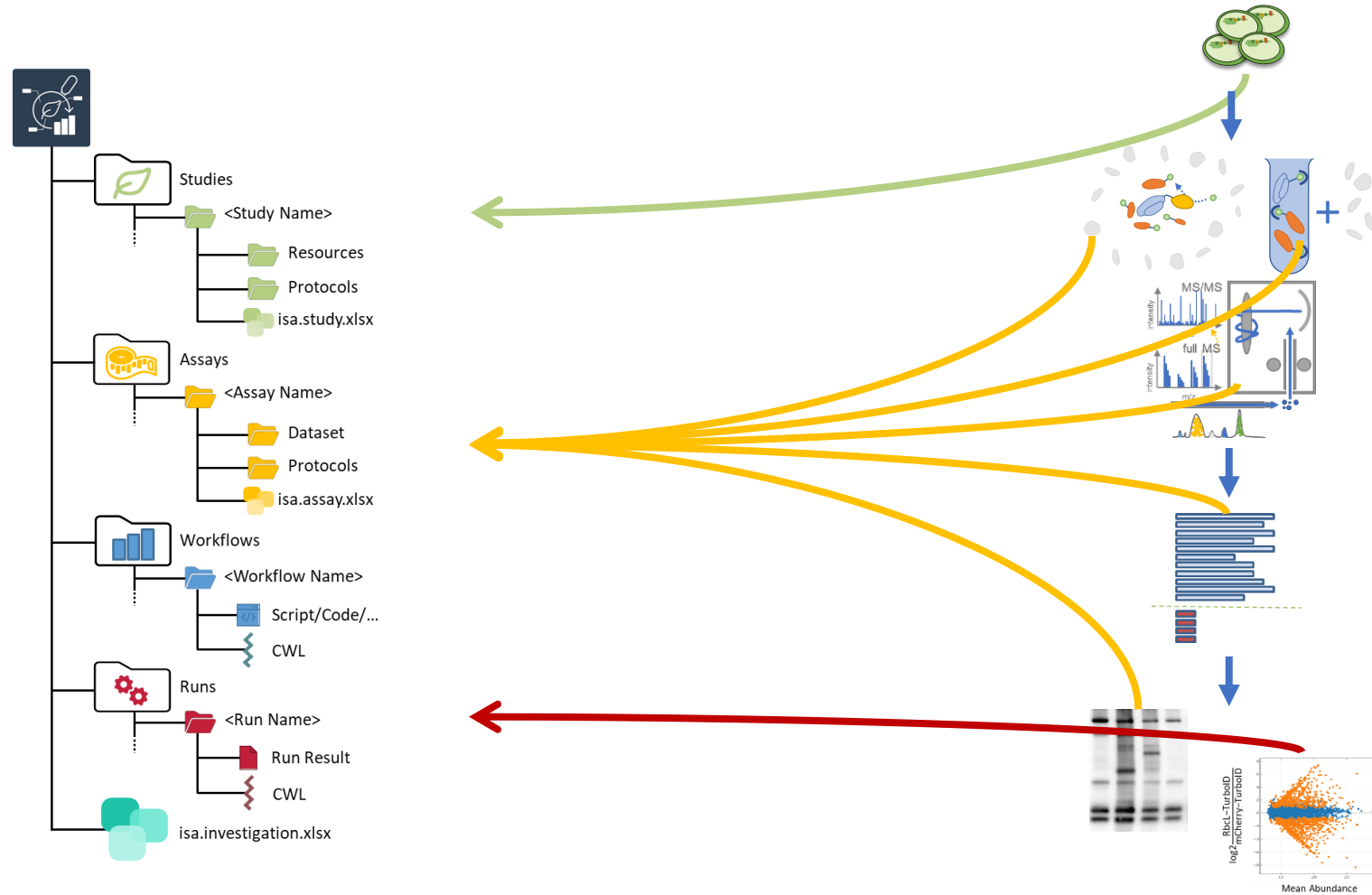
←
**Experimental
Data and
Meta Data**

←
**Computational
Data and Meta
Data**

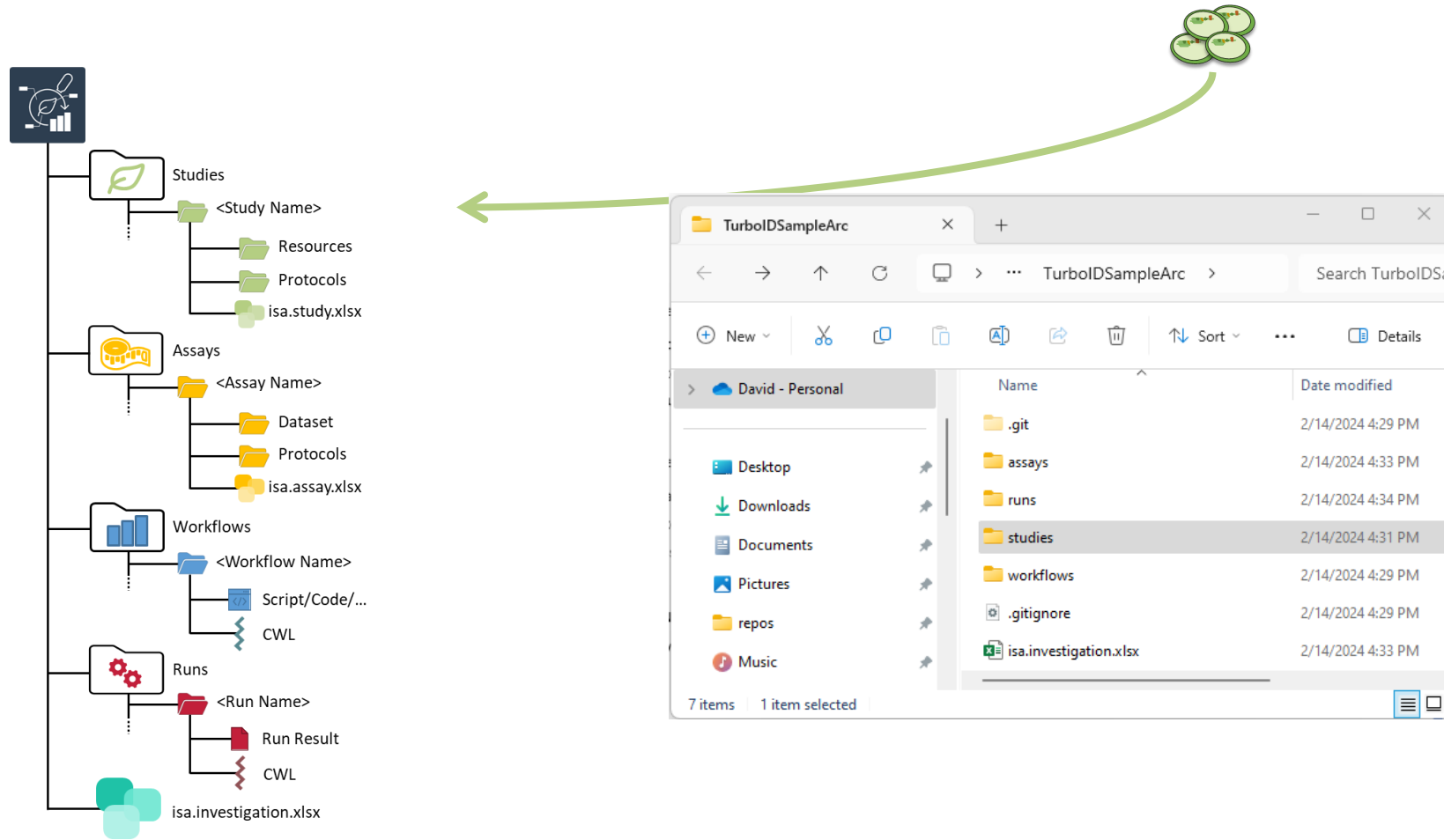
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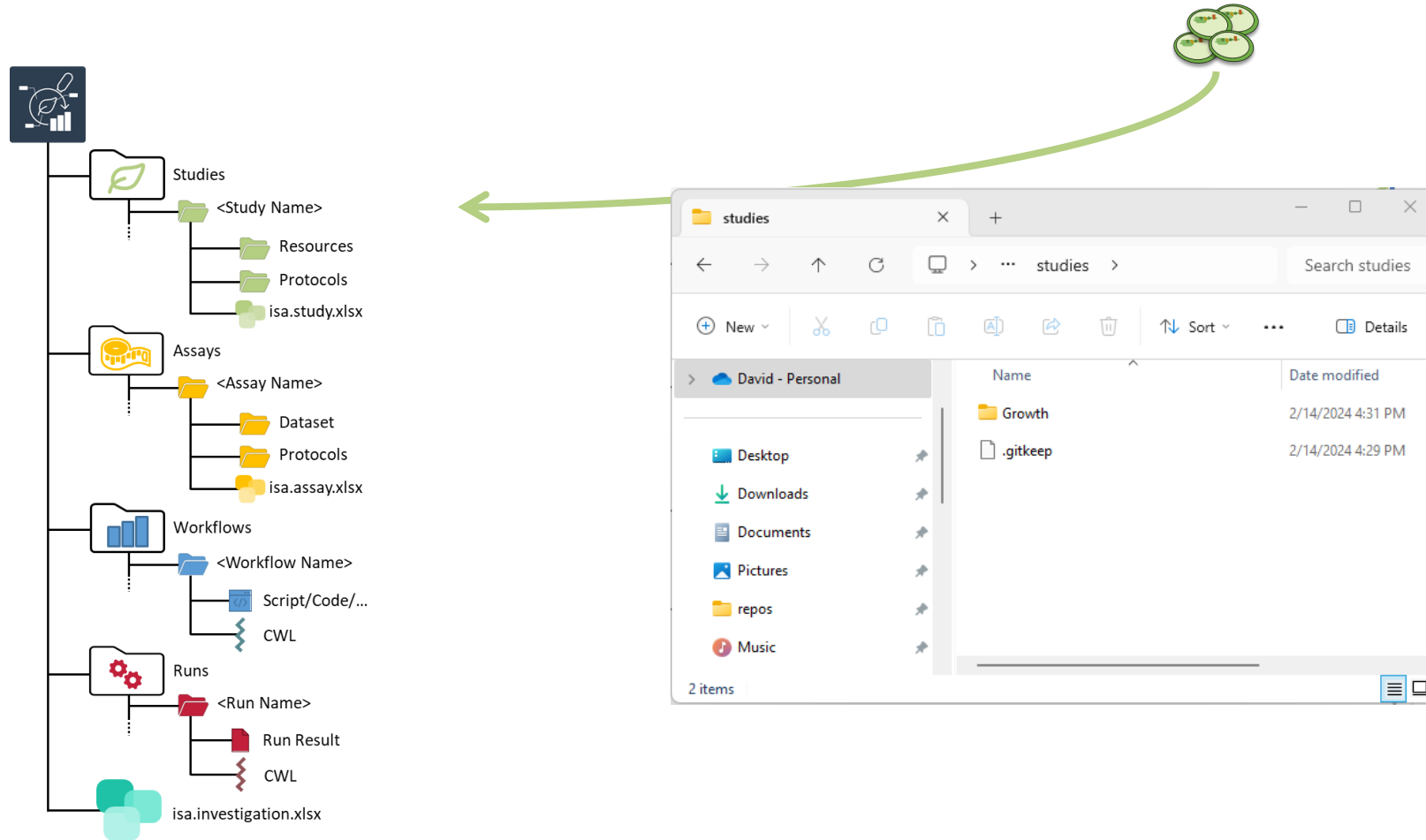
Important ARC Concepts: Structure and Data



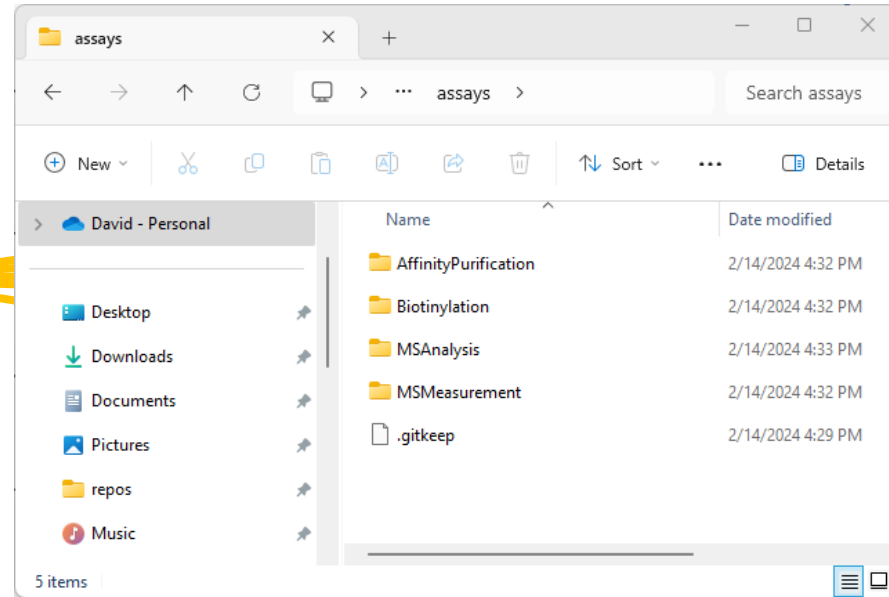
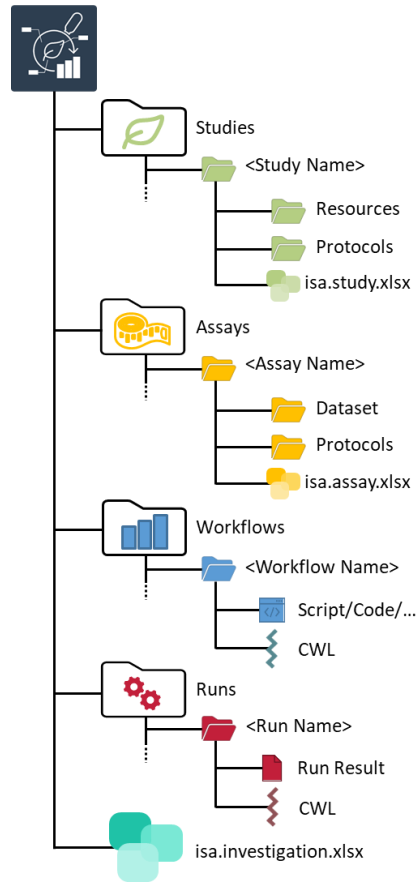
Important ARC Concepts: Structure and Data



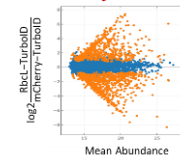
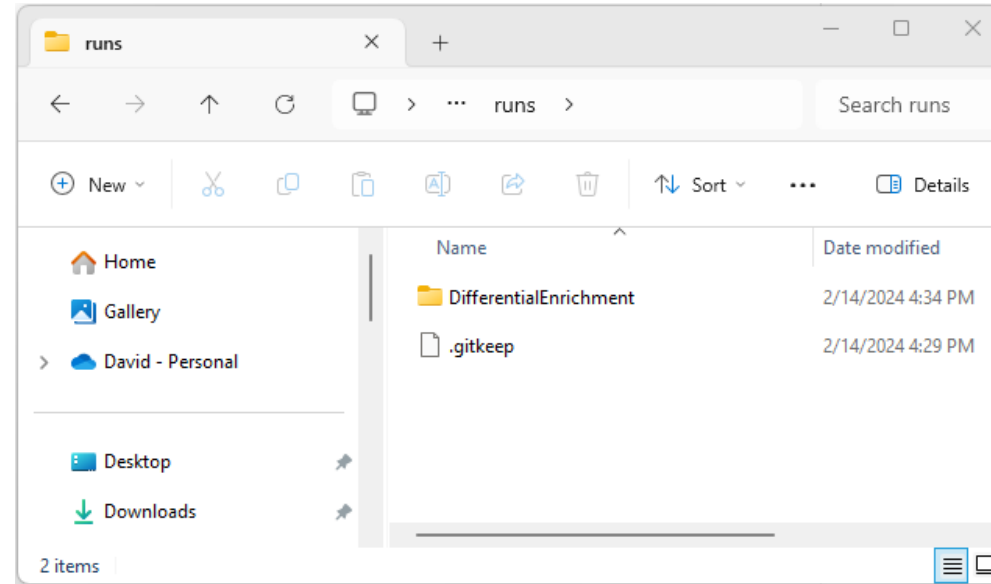
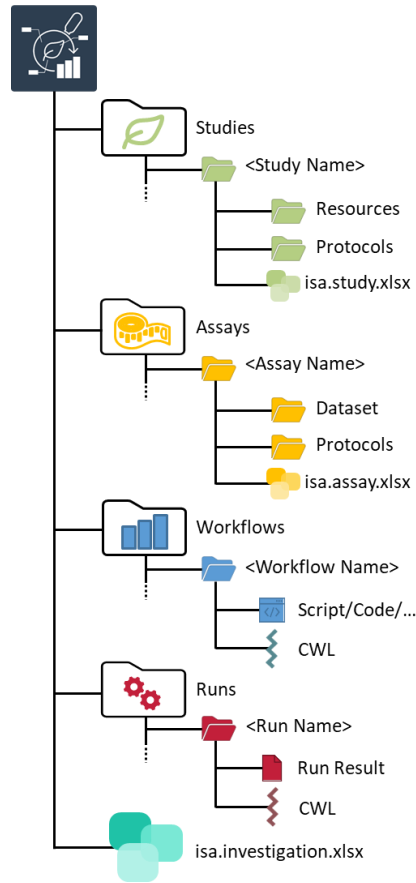
Important ARC Concepts: Structure and Data



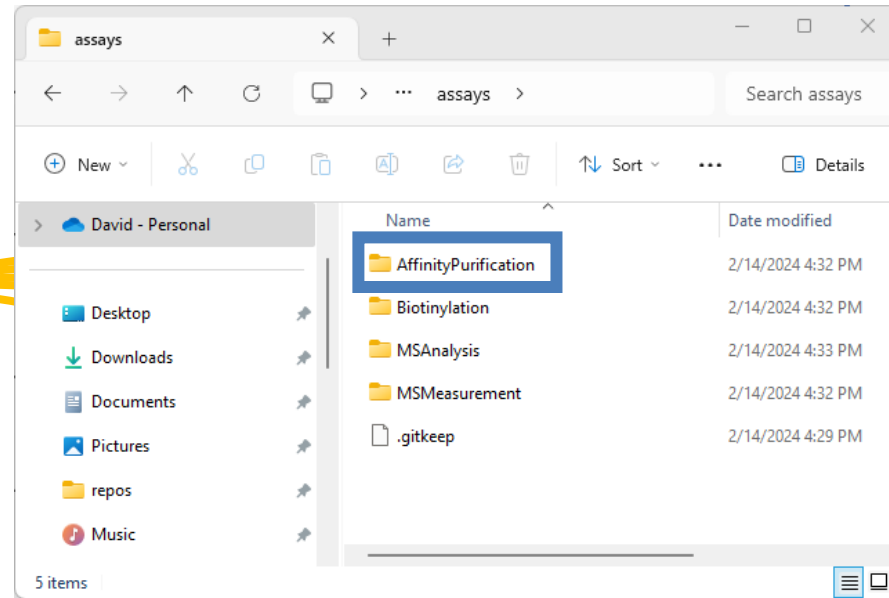
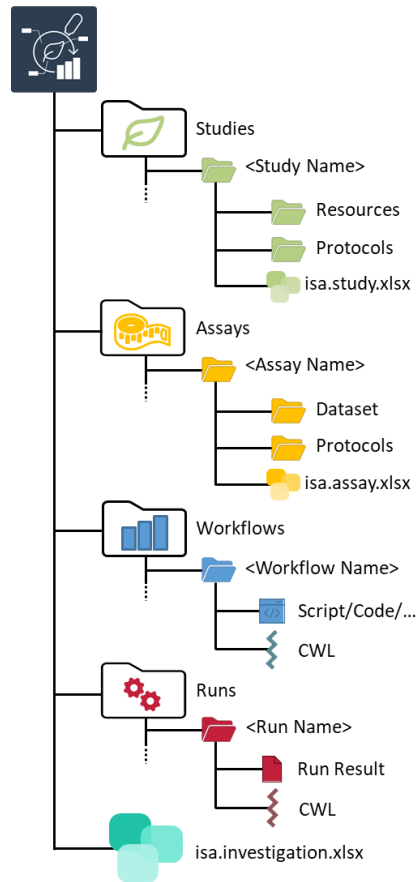
Important ARC Concepts: Structure and Data



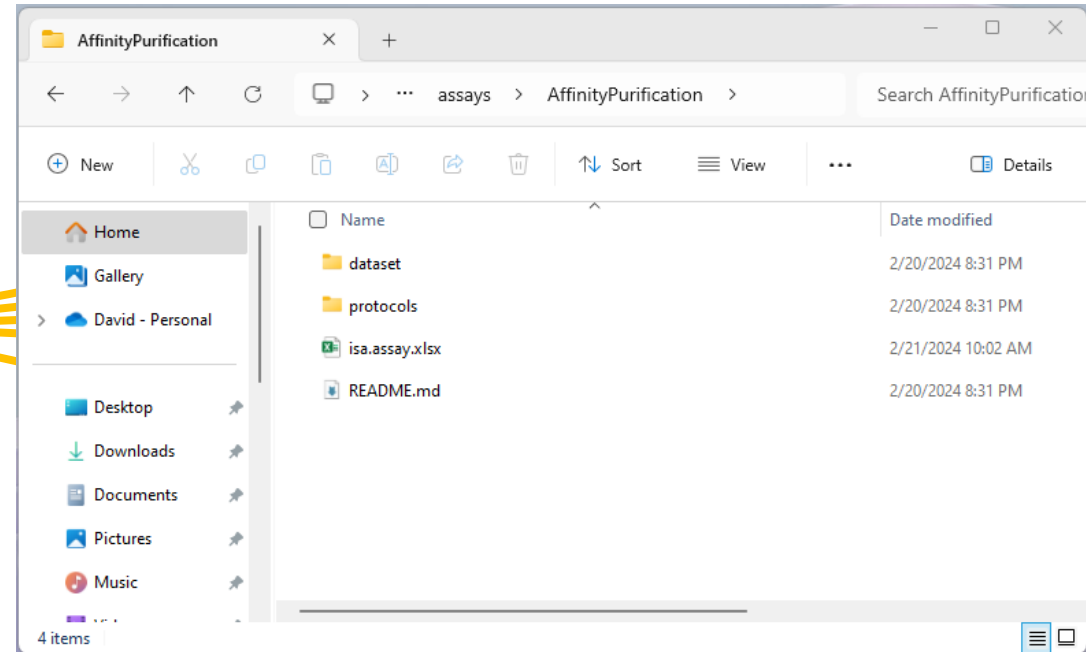
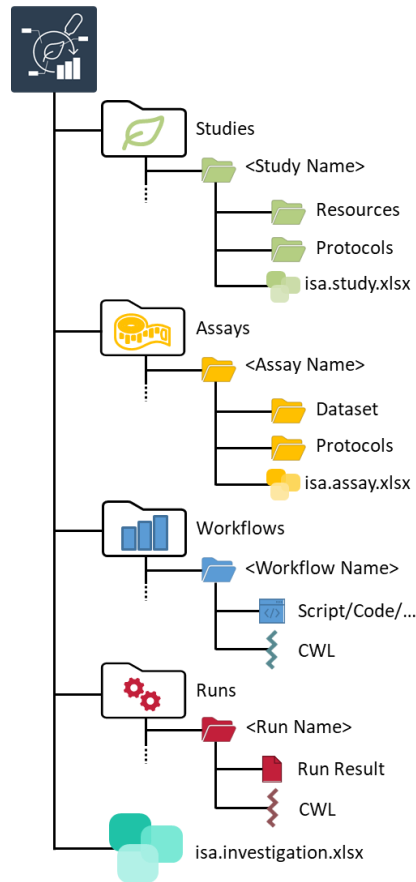
Important ARC Concepts: Structure and Data



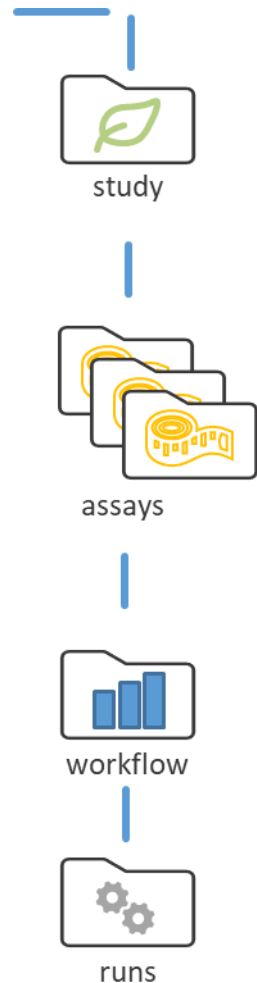
Important ARC Concepts: Structure and Data



Important ARC Concepts: Structure and Data



Agenda of part two

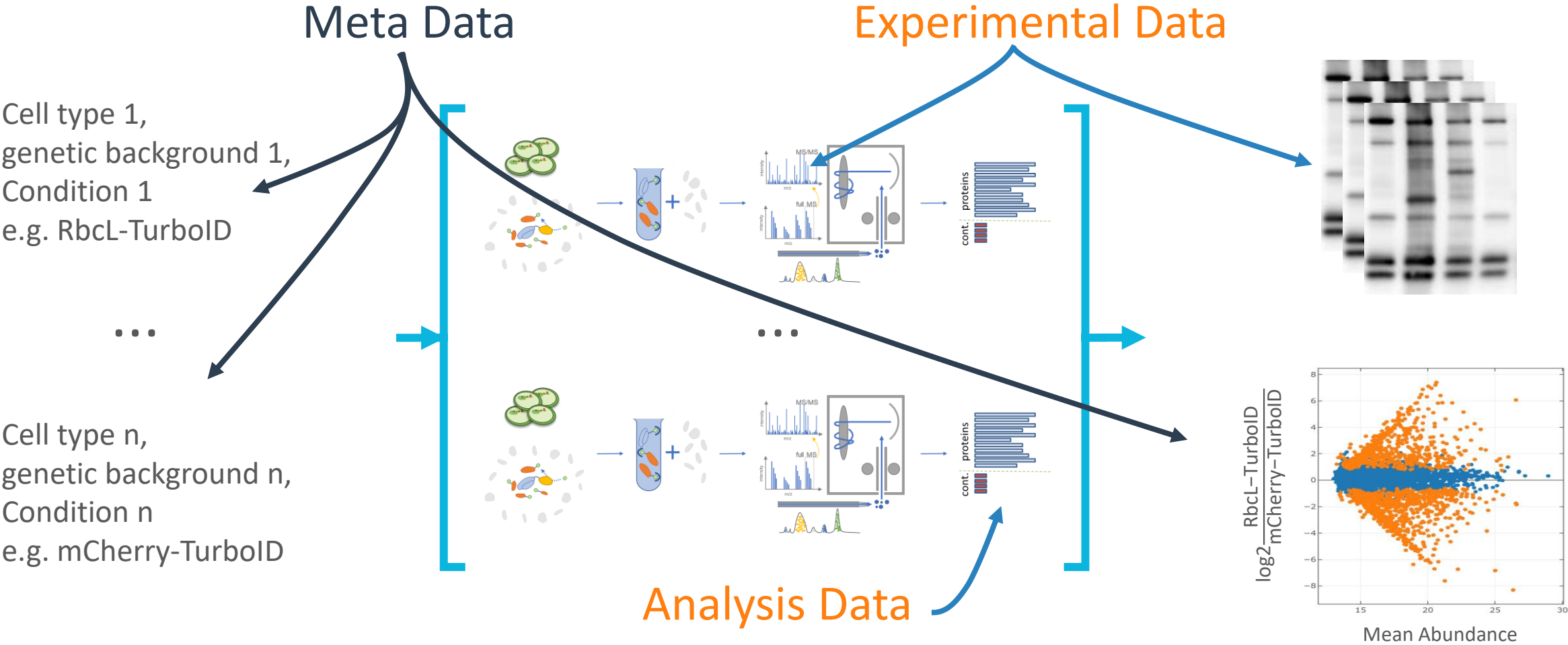


- I. Important ARC concepts by example: Structure
- II. Important ARC concepts by example: Meta Data Annotation Principle
- III. ARCs for FAIR collaboration using the PLANTDataHUB

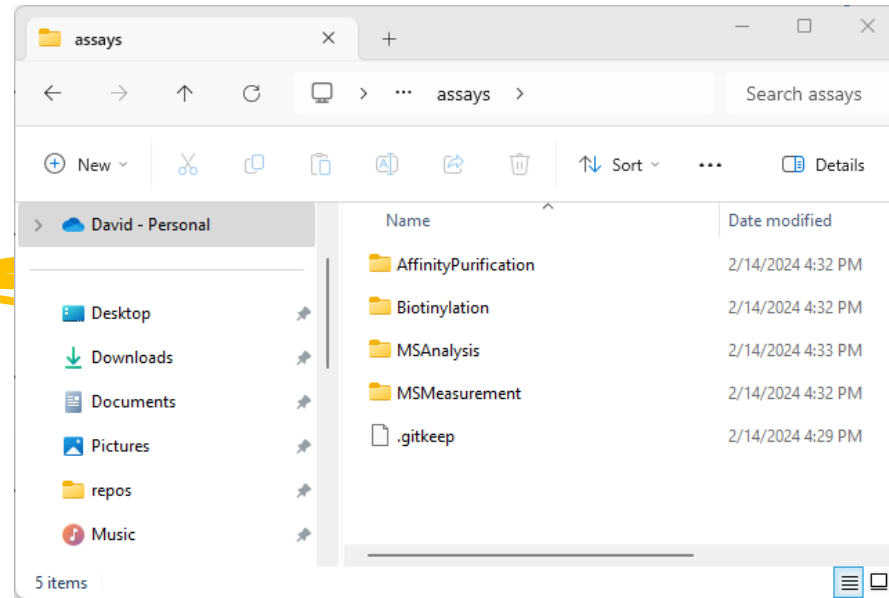
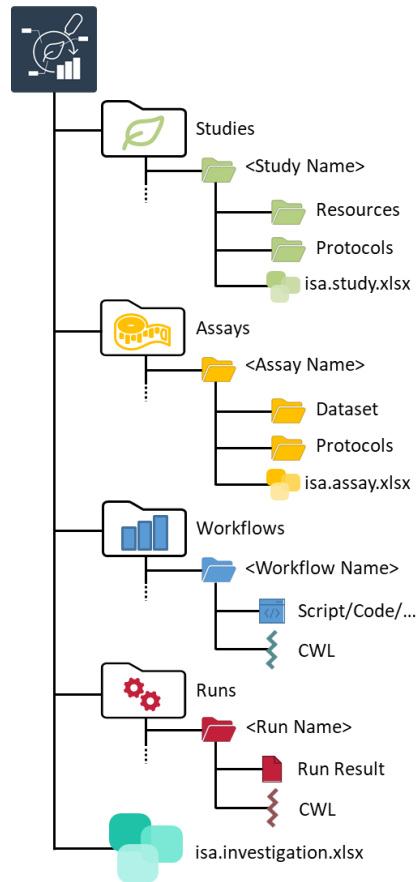


IV. Complete Walk-Through using the ARCitect

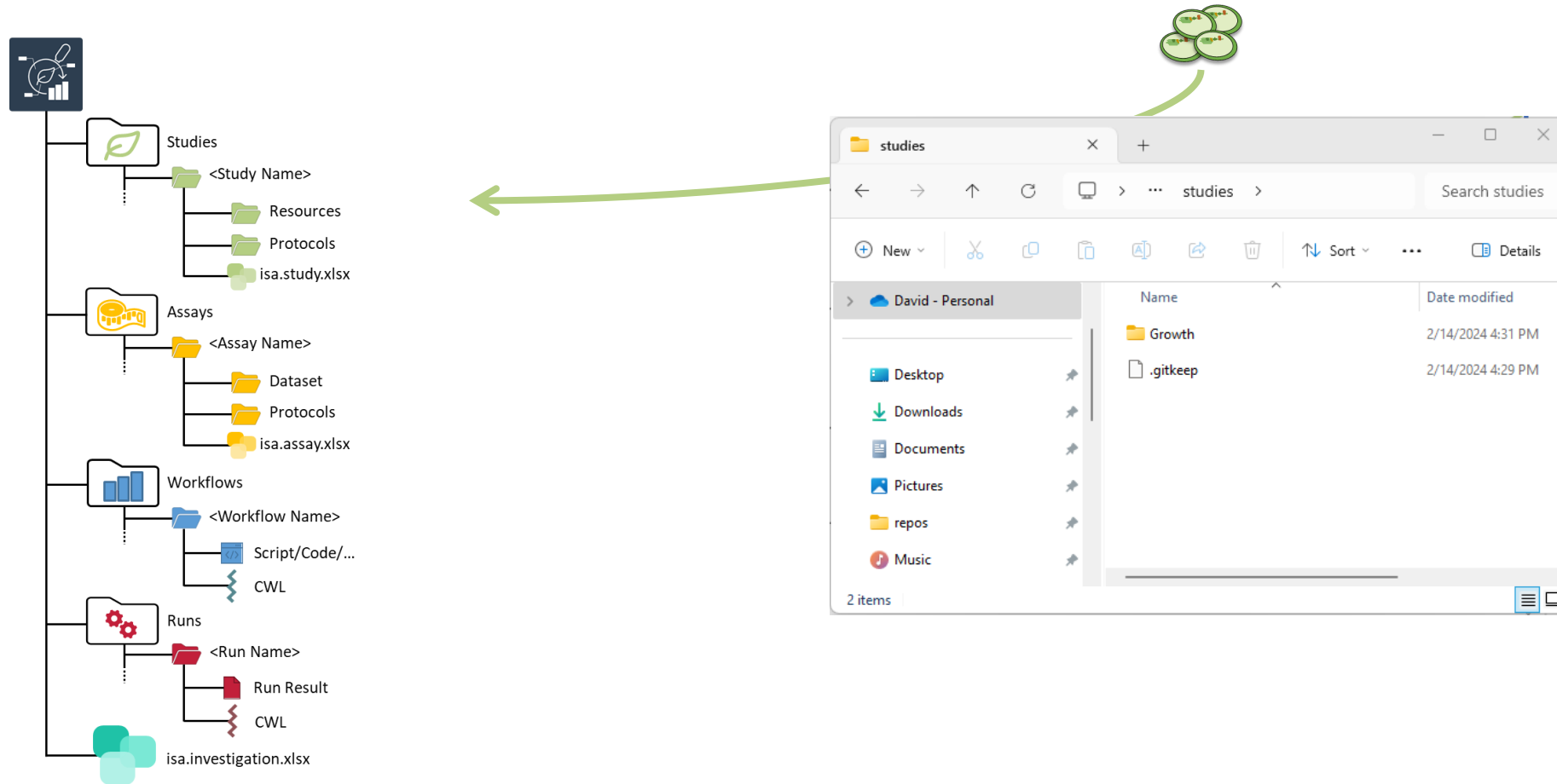
Motivation: An TurboID experiment



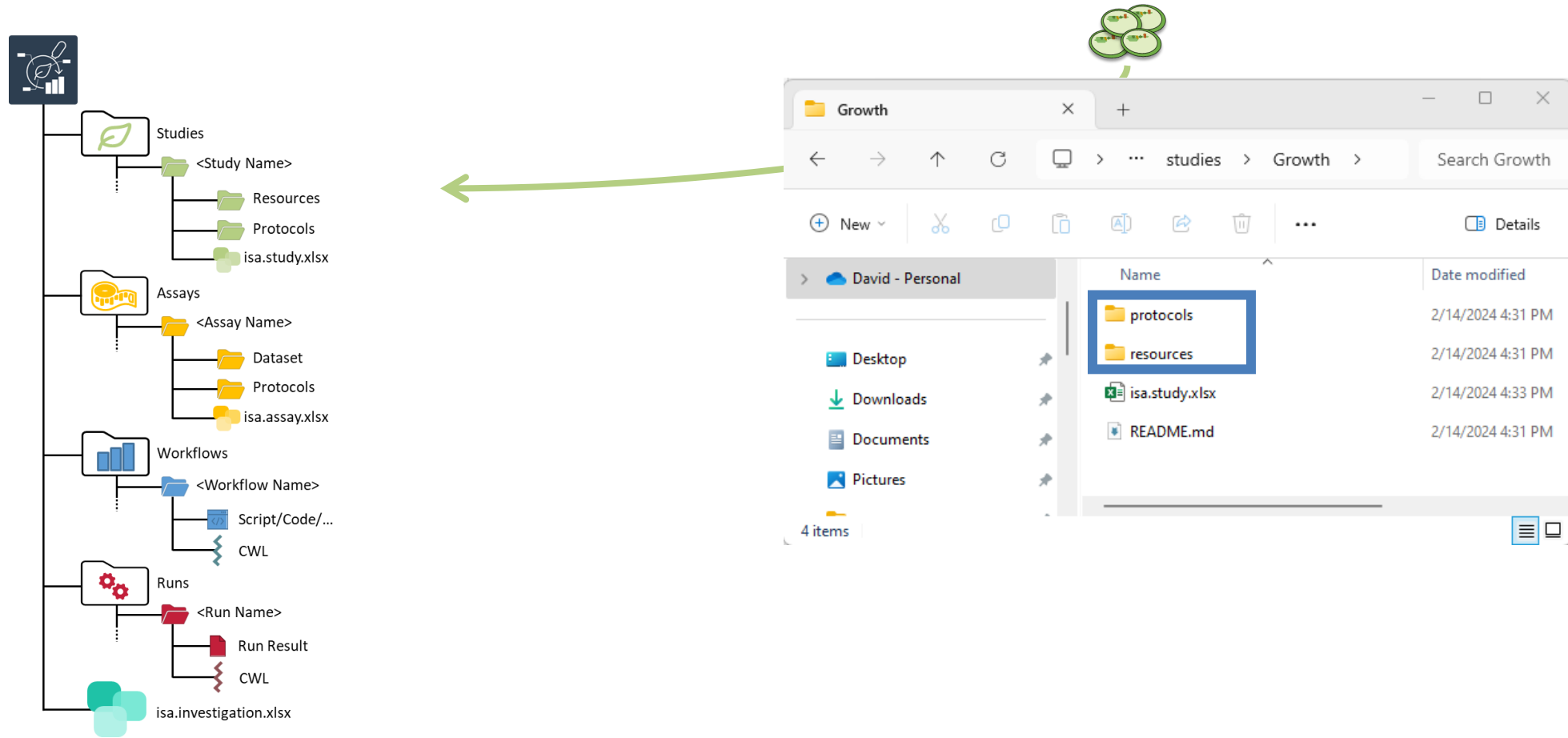
Important ARC Concepts: Meta Data



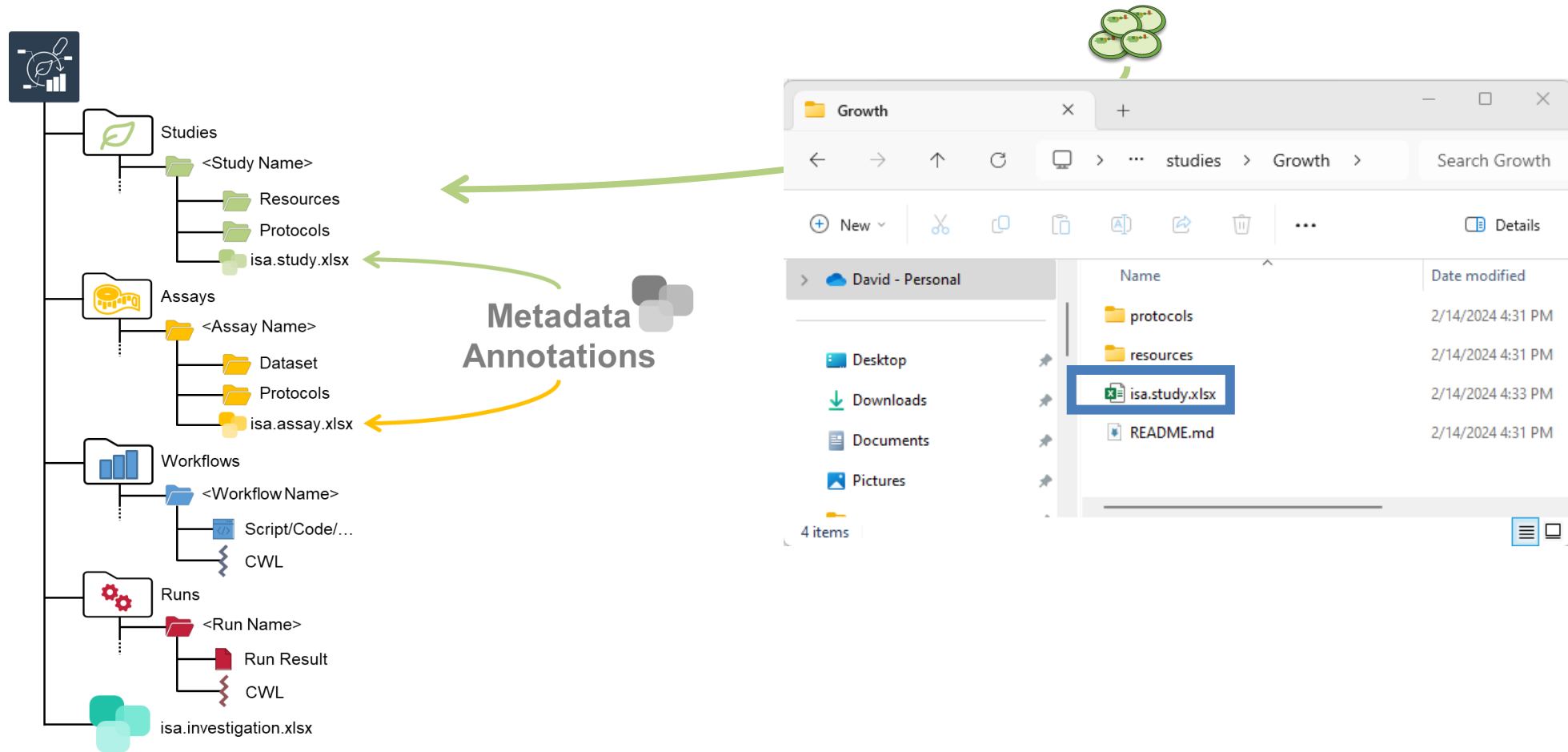
Important ARC Concepts: Meta Data



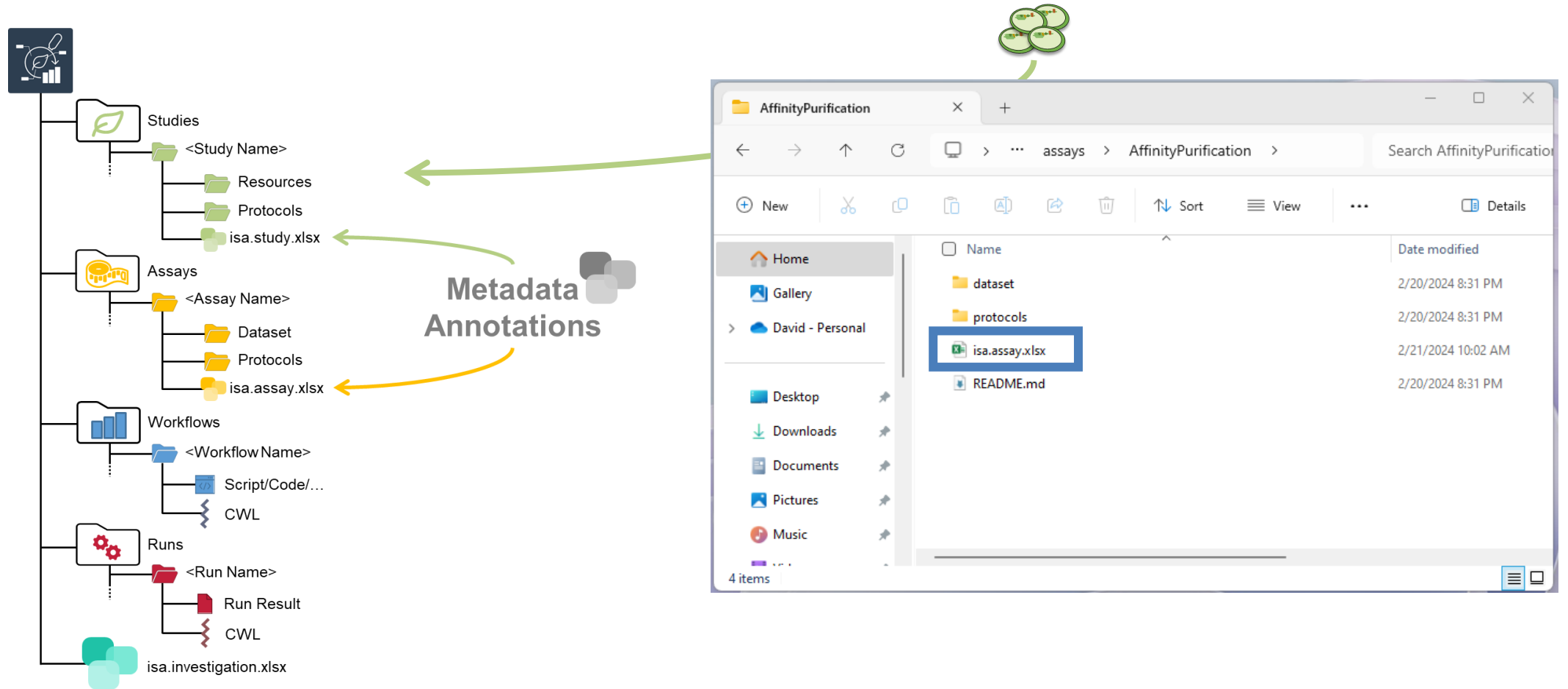
Important ARC Concepts: Meta Data



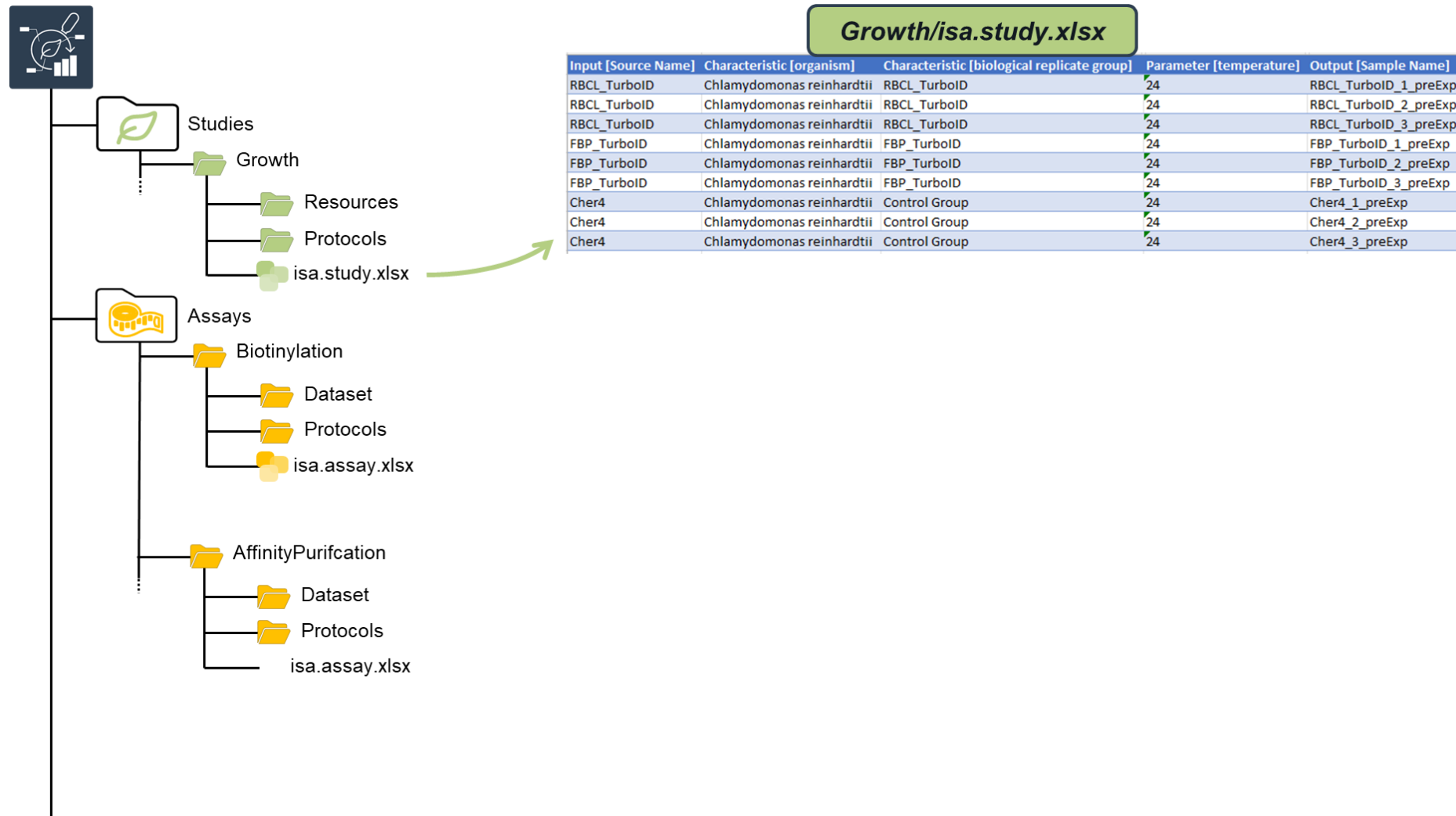
Important ARC Concepts: Meta Data



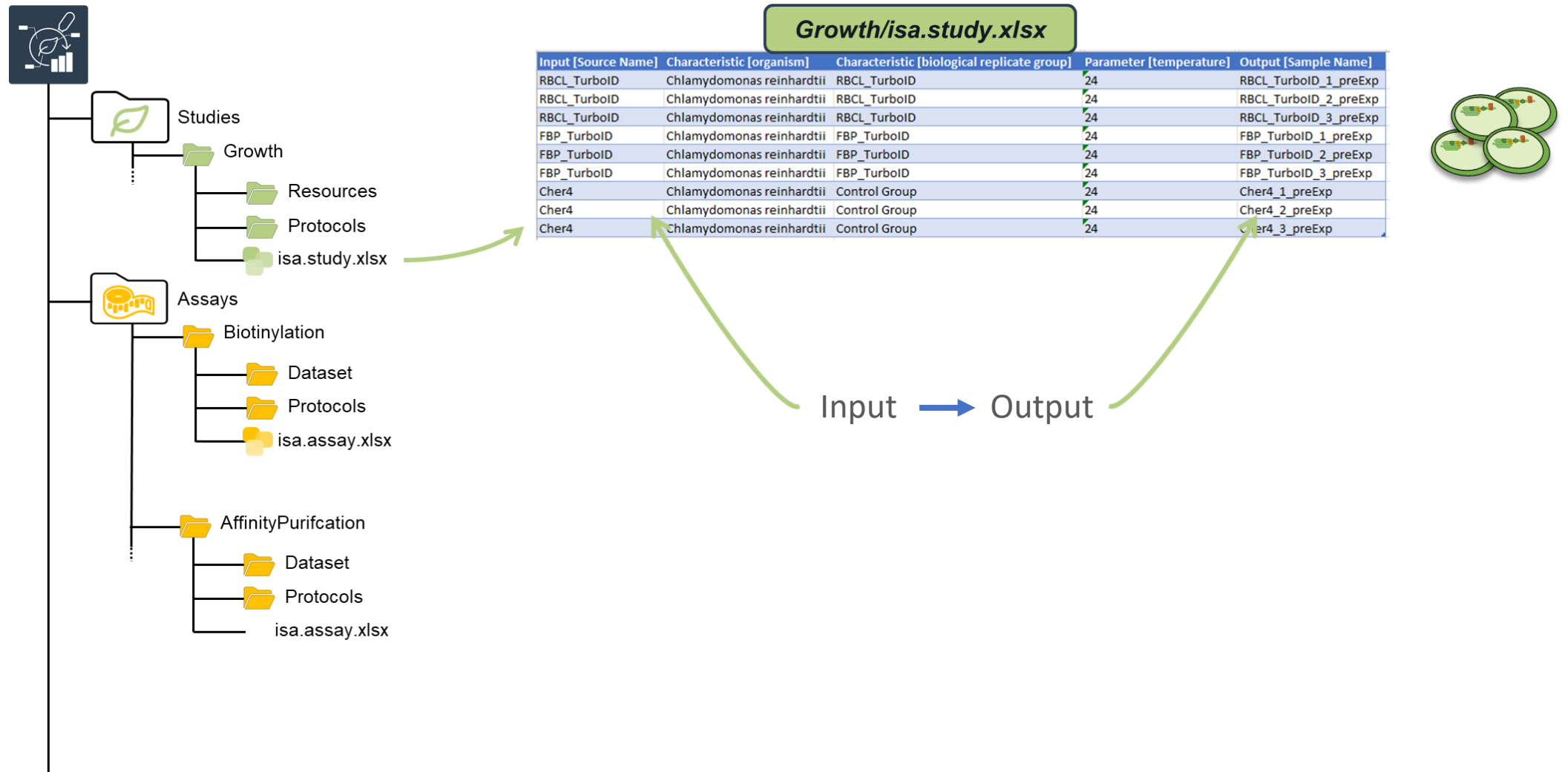
Important ARC Concepts: Meta Data



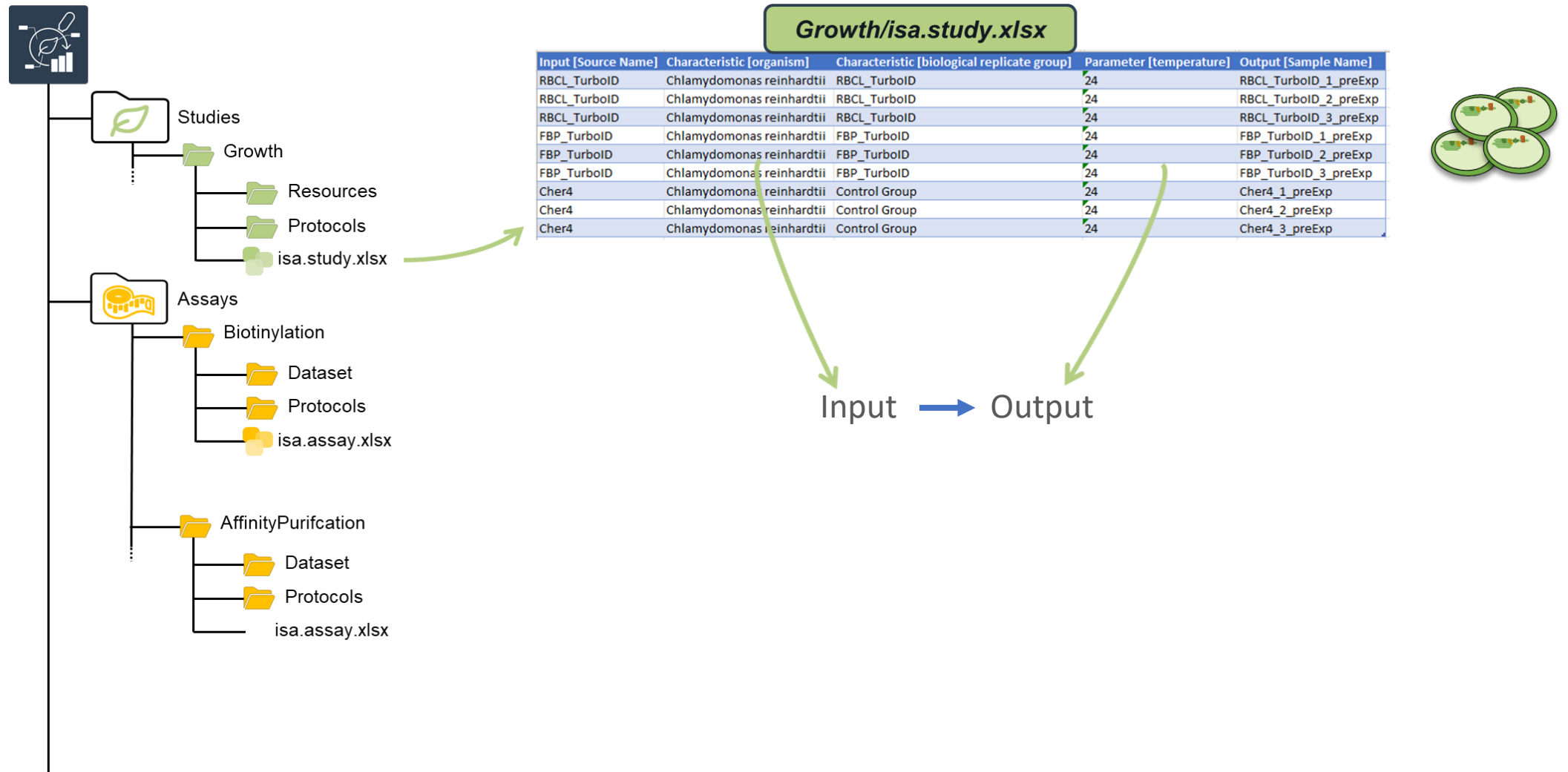
Important ARC Concepts: Meta Data



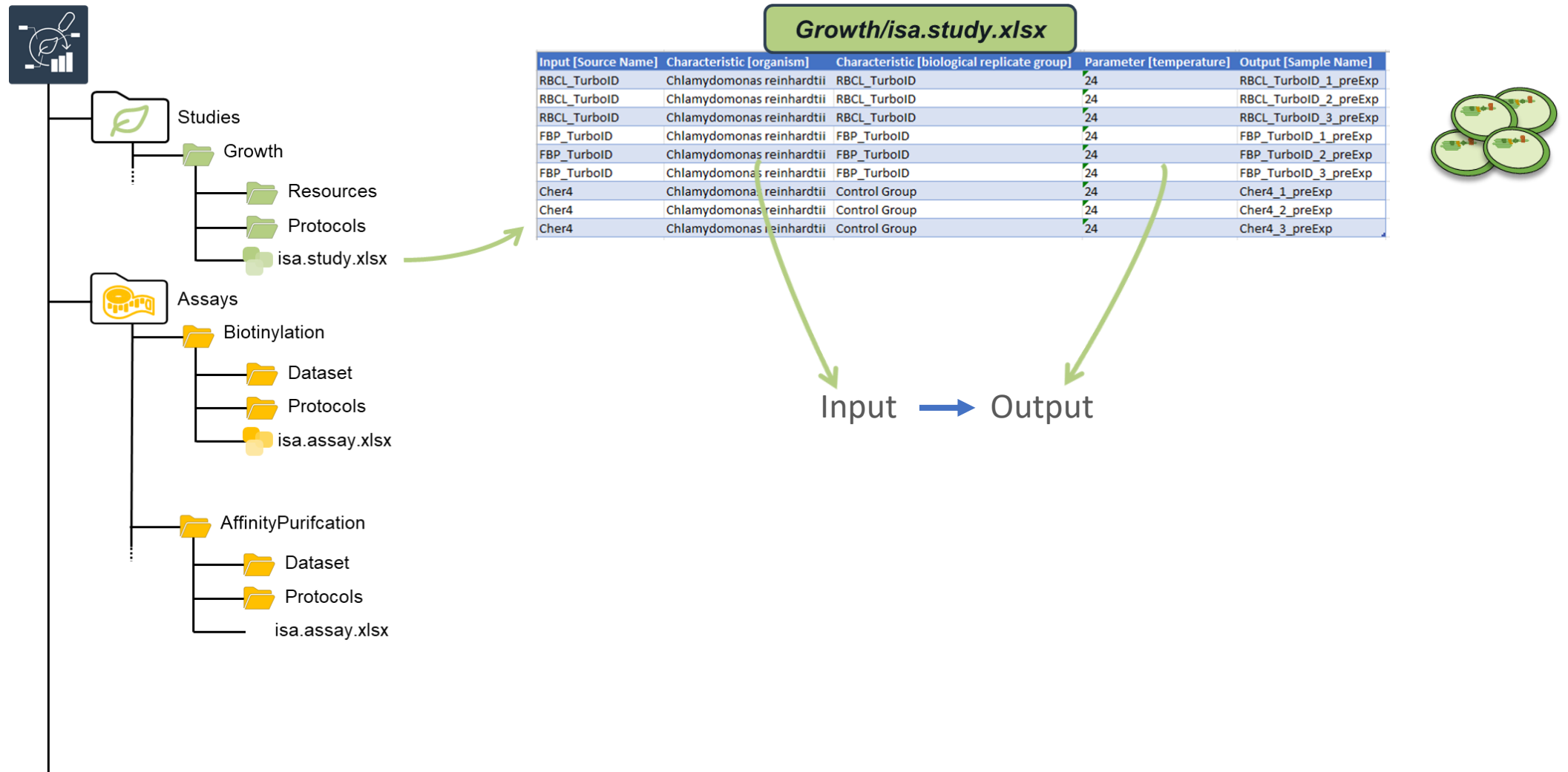
Important ARC Concepts: Meta Data



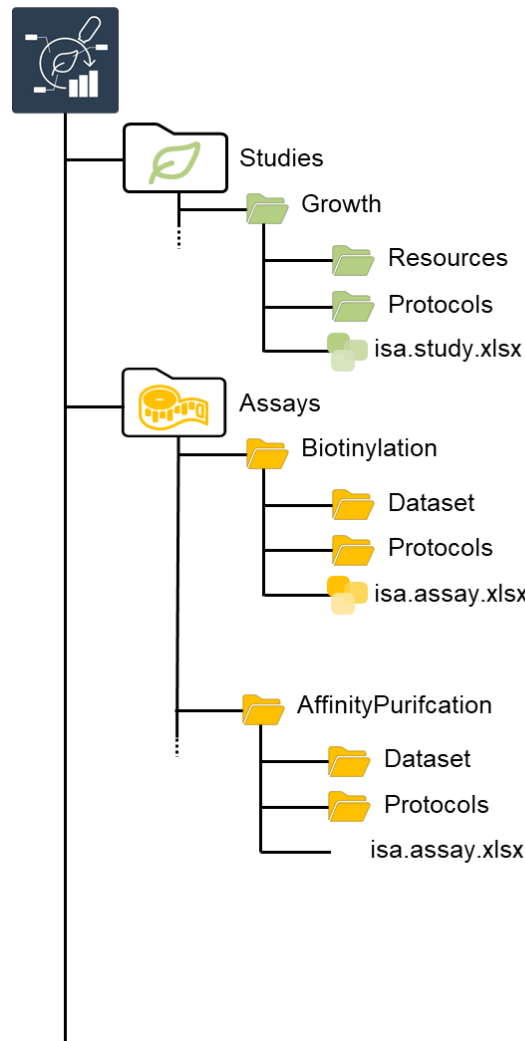
Important ARC Concepts: Meta Data



Important ARC Concepts: Meta Data

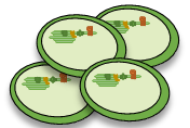


Important ARC Concepts: Meta Data



Growth/isa.study.xlsx

Input [Source Name]	Characteristic [organism]	Characteristic [biological replicate group]	Parameter [temperature]	Output [Sample Name]
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_1_preExp
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_2_preExp
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_3_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_1_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_2_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_3_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_1_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_2_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_3_preExp



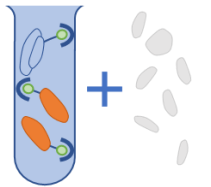
Biotinylation/isa.assay.xlsx

Input [Sample Name]	Parameter [temperature]	Parameter [light intensity exposure]	Parameter [Biotin-phenol]	Output [Sample Name]
RBCL_TurboID_1_preExp	24	60	100	RBCL_TurboID_1_postBio
RBCL_TurboID_2_preExp	24	60	100	RBCL_TurboID_2_postBio
RBCL_TurboID_3_preExp	24	60	100	RBCL_TurboID_3_postBio
FBP_TurboID_1_preExp	24	60	100	FBP_TurboID_1_postBio
FBP_TurboID_2_preExp	24	60	100	FBP_TurboID_2_postBio
FBP_TurboID_3_preExp	24	60	100	FBP_TurboID_3_postBio
Cher4_1_preExp	24	60	100	Cher4_1_postBio
Cher4_2_preExp	24	60	100	Cher4_2_postBio
Cher4_3_preExp	24	60	100	Cher4_3_postBio

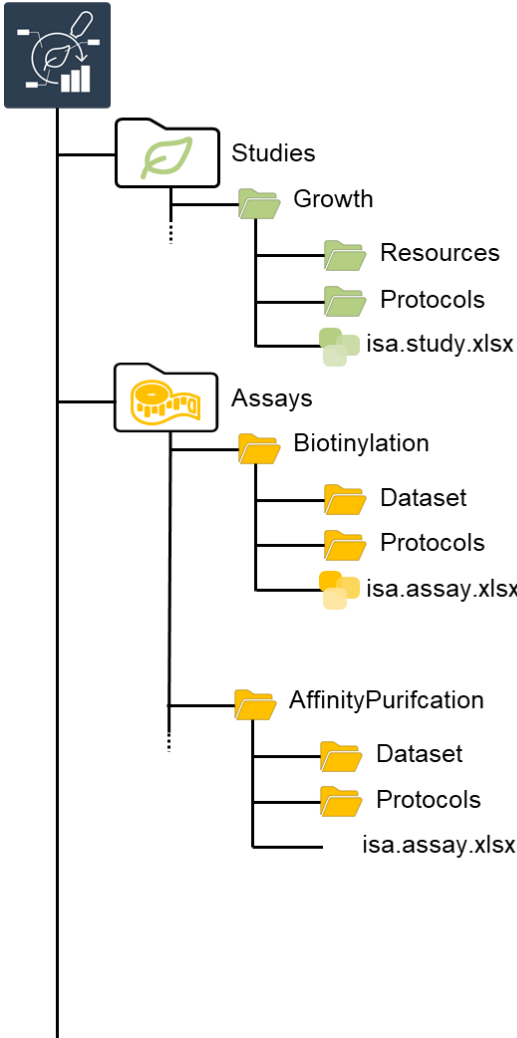


AffinityPurification/isa.assay.xlsx

Input [Sample Name]	Parameter [affinity column]	Parameter [Buffer]	Parameter [Biotin]	Output [Sample Name]
RBCL_TurboID_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_1_eluate
RBCL_TurboID_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_2_eluate
RBCL_TurboID_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_3_eluate
FBP_TurboID_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_1_eluate
FBP_TurboID_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_2_eluate
FBP_TurboID_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_3_eluate
Cher4_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_1_eluate
Cher4_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_2_eluate
Cher4_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_3_eluate



Important ARC Concepts: Meta Data



Growth/isa.study.xlsx

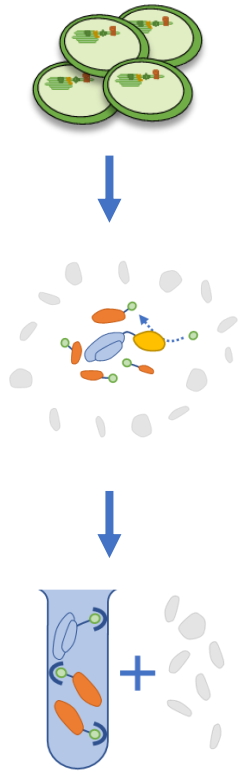
Input [Source Name]	Characteristic [organism]	Characteristic [biological replicate group]	Parameter [temperature]	Output [Sample Name]
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_1_preExp
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_2_preExp
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_3_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_1_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_2_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_3_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_1_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_2_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_3_preExp

Biotinylation/isa.assay.xlsx

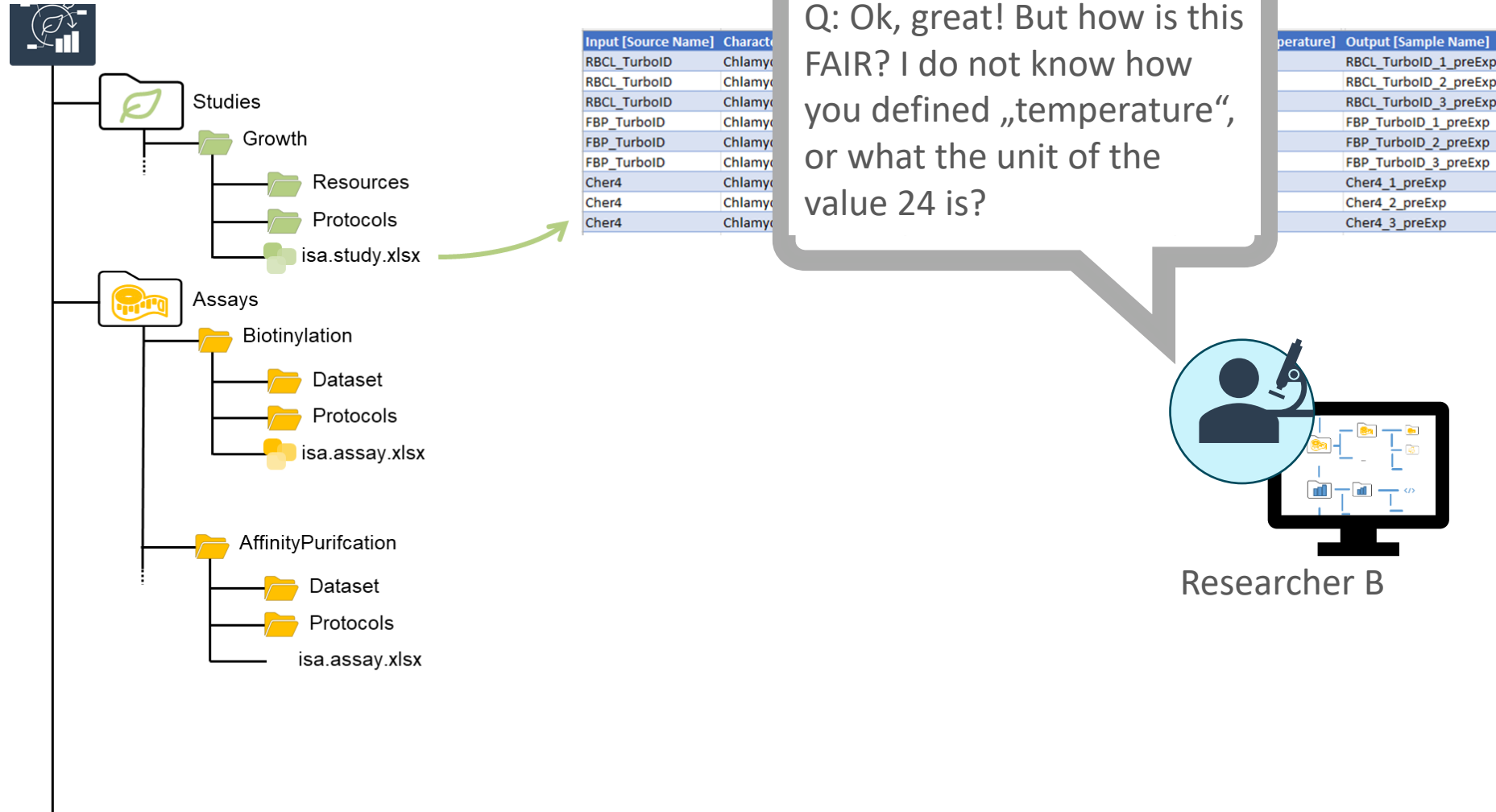
Input [Sample Name]	Parameter [temperature]	Parameter [light intensity exposure]	Parameter [Biotin-phenol]	Output [Sample Name]
RBCL_TurboID_1_preExp	24	60	100	RBCL_TurboID_1_postBio
RBCL_TurboID_2_preExp	24	60	100	RBCL_TurboID_2_postBio
RBCL_TurboID_3_preExp	24	60	100	RBCL_TurboID_3_postBio
FBP_TurboID_1_preExp	24	60	100	FBP_TurboID_1_postBio
FBP_TurboID_2_preExp	24	60	100	FBP_TurboID_2_postBio
FBP_TurboID_3_preExp	24	60	100	FBP_TurboID_3_postBio
Cher4_1_preExp	24	60	100	Cher4_1_postBio
Cher4_2_preExp	24	60	100	Cher4_2_postBio
Cher4_3_preExp	24	60	100	Cher4_3_postBio

AffinityPurification/isa.assay.xlsx

Input [Sample Name]	Parameter [affinity column]	Parameter [Buffer]	Parameter [Biotin]	Output [Sample Name]
RBCL_TurboID_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_1_eluate
RBCL_TurboID_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_2_eluate
RBCL_TurboID_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_3_eluate
FBP_TurboID_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_1_eluate
FBP_TurboID_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_2_eluate
FBP_TurboID_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_3_eluate
Cher4_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_1_eluate
Cher4_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_2_eluate
Cher4_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_3_eluate



Important ARC Concepts: Meta Data



Important ARC Concepts: Meta Data

ARC Structure:

- Studies
 - Growth
 - Resources
 - Protocols
 - isa.study.xlsx
- Assays
 - Biotinylation
 - Dataset
 - Protocols
 - isa.assay.xlsx
 - AffinityPurification
 - Dataset
 - Protocols
 - isa.assay.xlsx

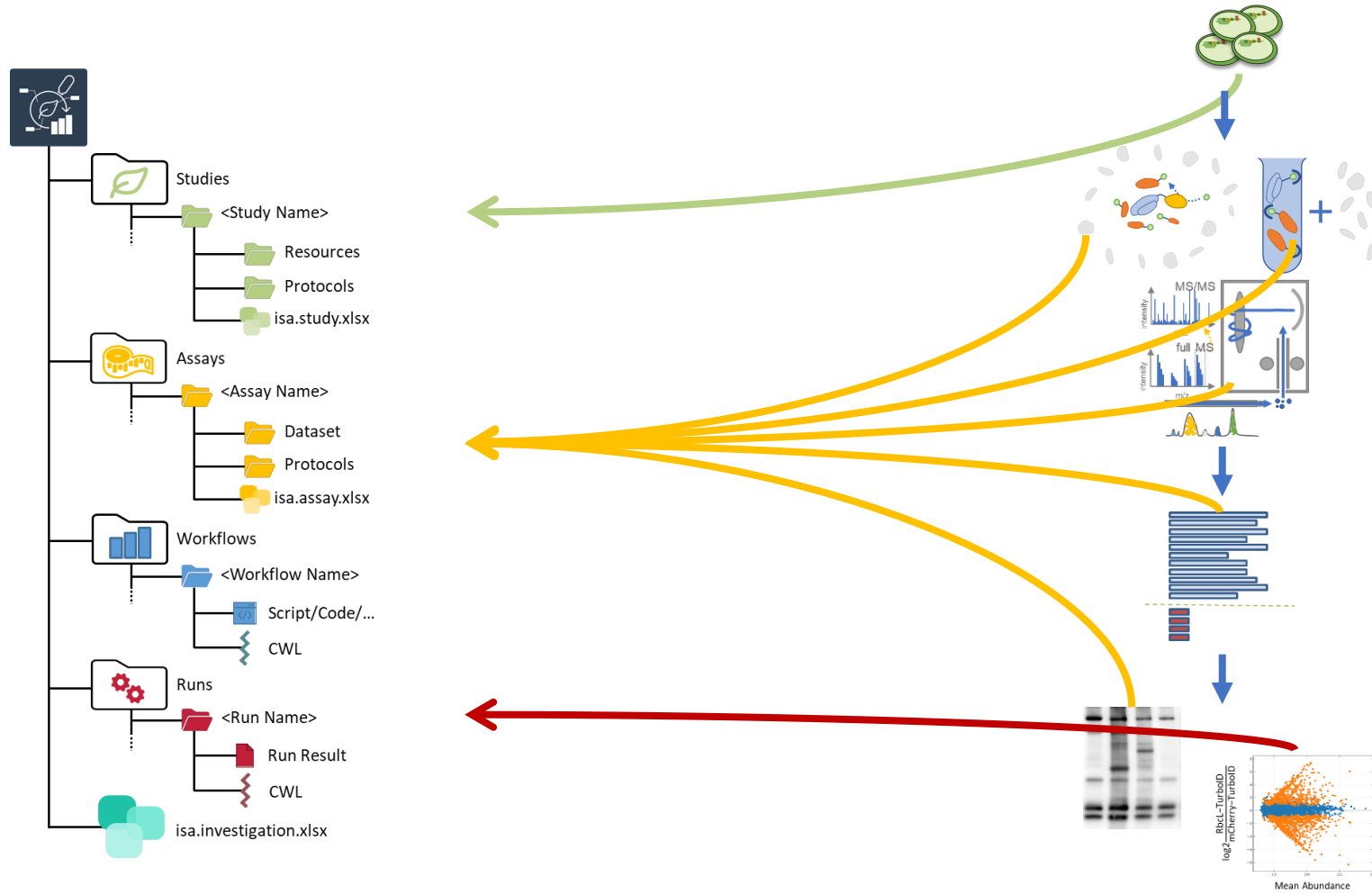
Growth/isa.study.xlsx Table:

Input [Source Name]	Characteristic [organism]	Characteristic [biological replicate group]	Parameter [temperature]	Output [Sample Name]
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_1_preExp
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_2_preExp
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_3_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_1_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_2_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_3_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_1_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_2_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_3_preExp

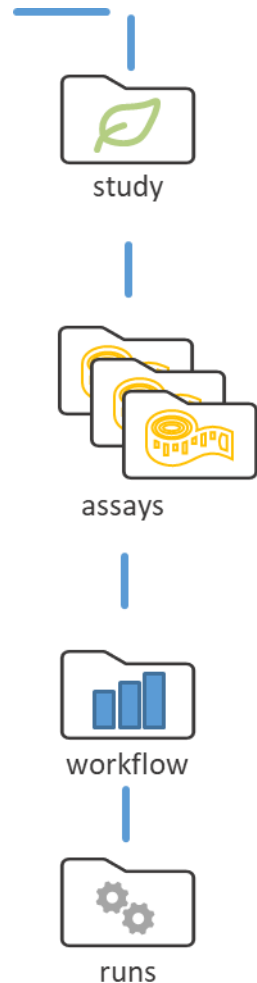
ARCitect Interface:

- File Explorer: TurboIDWorkshop > assays > runs > studies > Growth
- Assay View: Growth
 - Input [Source Name]: PsbQ_TurboID
 - Characteristic [organism]: Chlamydomonas reinhardtii
 - Characteristic [plasmid]: PsbQ_TurboID
 - Parameter [temperature]: 24 degree celsius
- Parameter List:
 - temperate: ENVO:01000206
 - Temperature: NCIT:C25206
 - temperature: PATO:0000146
 - Temperament: NCIT:C93212
 - temperature: EFO:0001702
 - Temperature Day: NFDI4PSO:0000007
 - temperate biome: ENVO:01001831
 - Air temperature: MIAPPE:0096

Important ARC Concepts: Meta Data



Agenda of part two



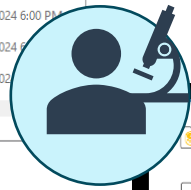
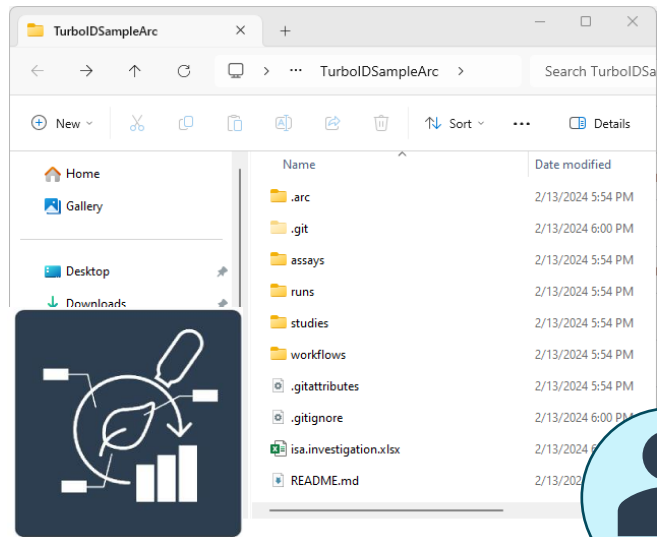
- I. Important ARC concepts by example: Structure
- II. Important ARC concepts by example: Meta Data Annotation Principle
- III. ARCs for FAIR collaboration using the PLANTDataHUB



IV. Complete Walk-Through using the ARCitect

Now: ARCs as a single RDM entry point

Researcher A's data management solution:
Annotated Research Context (ARC)

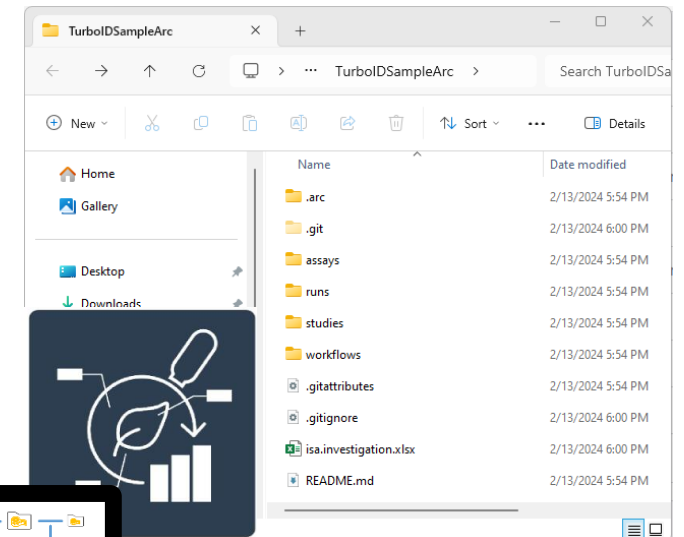


Researcher A

How do we
exchange data?
More Metadata?
Any Updates?

← Collaboration →

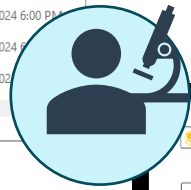
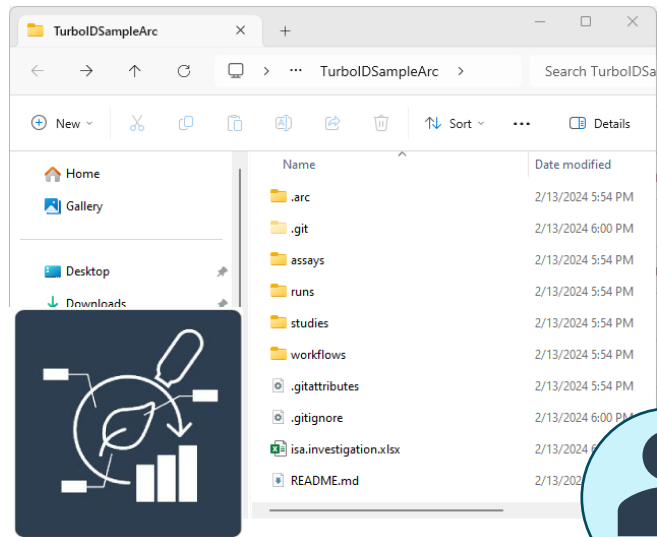
Researcher B's data management solution:
Annotated Research Context (ARC)



Researcher B

Now: Using the PLANTDataHUB to collaborate

Researcher A's data management solution:
Annotated Research Context (ARC)



Researcher A

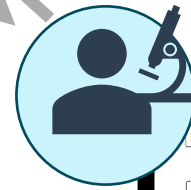
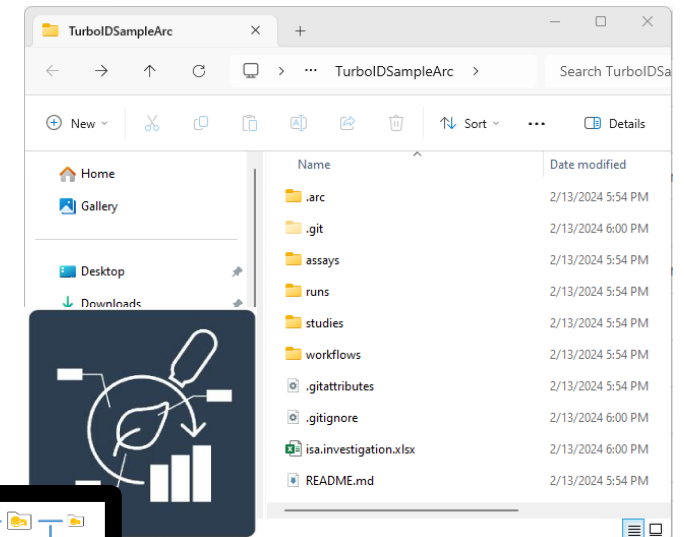


DataHUB



Collaboration

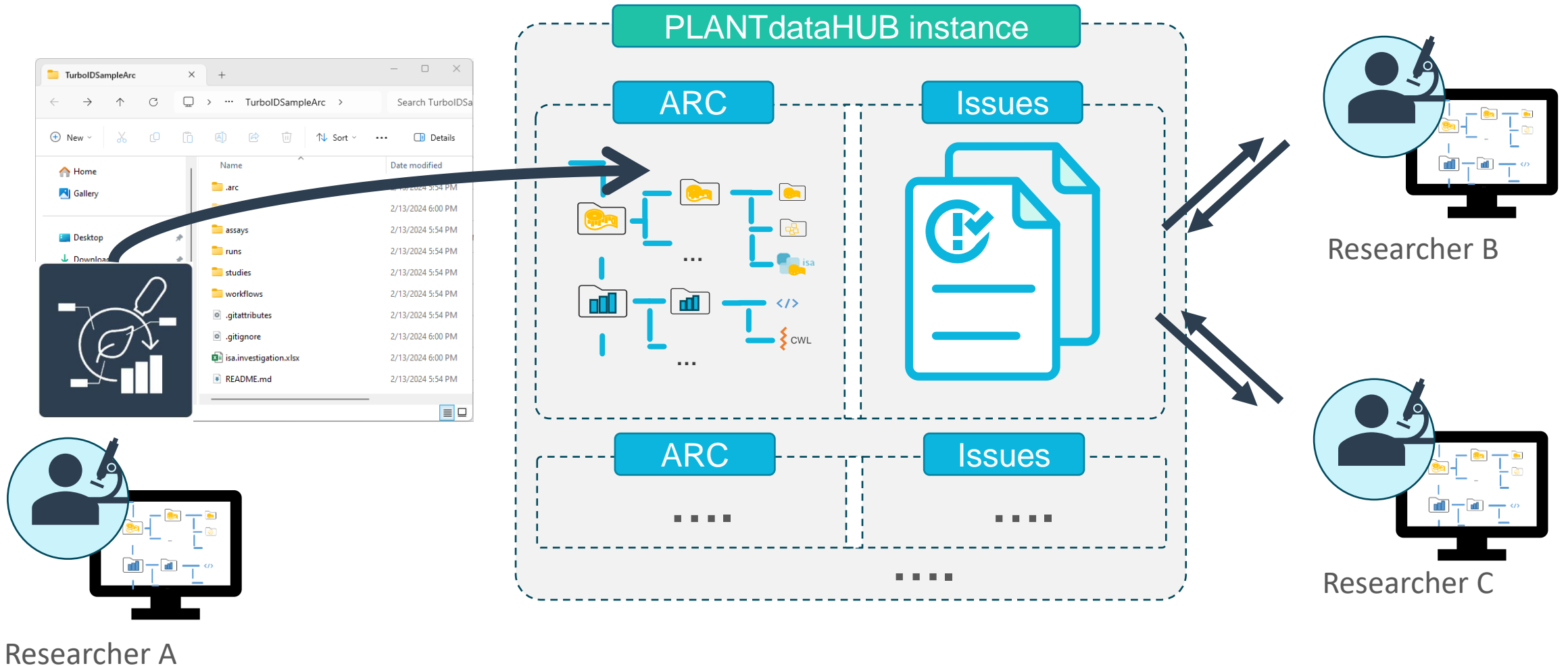
Researcher B's data management solution:
Annotated Research Context (ARC)



Researcher B



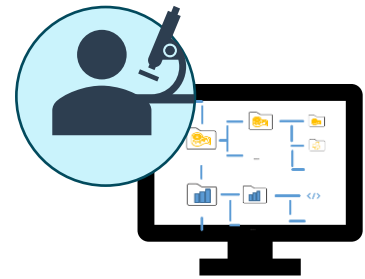
Now: Using the PLANTDataHUB to collaborate



Now: Using the PLANTDataHUB to collaborate

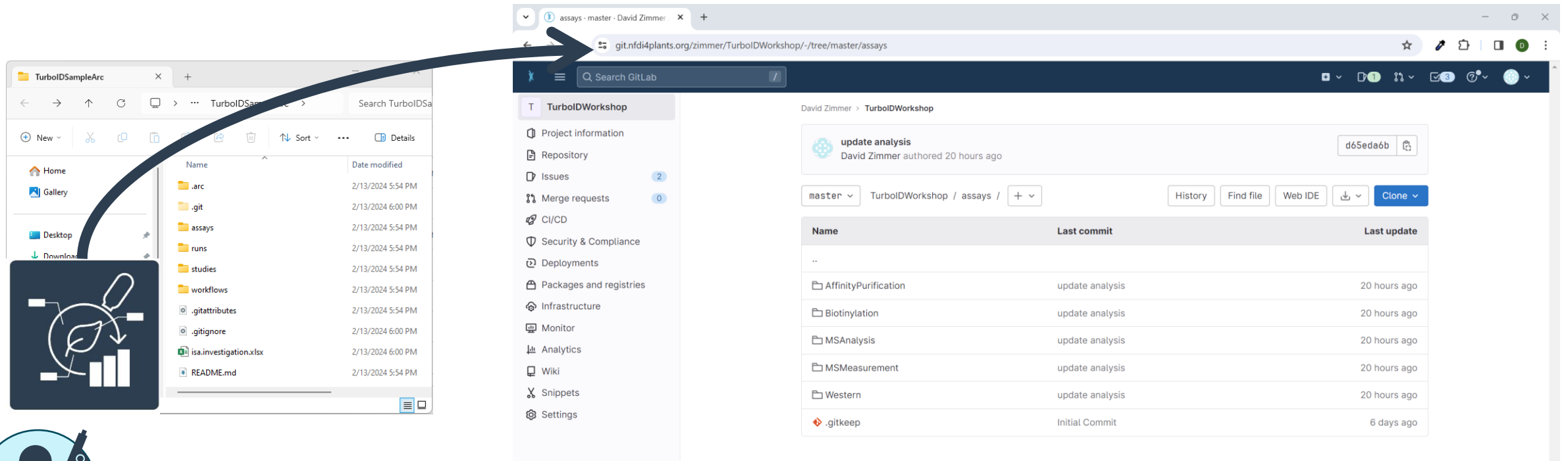
The image shows a workflow where a local file explorer is connected to a remote GitLab repository. The file explorer on the left shows a directory structure for 'TurboIDSampleArc' with folders like .arc, .git, assays, runs, studies, workflows, and files like .gitattributes, .gitignore, isa.investigation.xlsx, and README.md. An arrow points from this directory to the GitLab repository page on the right, which displays the 'TurboIDWorkshop' repository. The repository page shows project information, a commit history table, and various repository management options.

Name	Last commit	Last update
assays	update analysis	19 hours ago
runs	update analysis	19 hours ago
studies	update analysis	19 hours ago
workflows	add executable Workflow	22 hours ago
.gitattributes	update analysis	19 hours ago
.gitignore	Initial Commit	6 days ago
isa.investigation.xlsx	update analysis	19 hours ago



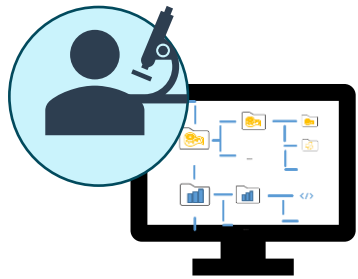
Researcher A

Now: Using the PLANTDataHUB to collaborate



The image shows a workflow for collaboration. On the left, a file explorer window displays the contents of a local directory named 'TurboIDSampleArc'. The 'assays' folder is highlighted, and a large blue arrow points from it to the corresponding 'assays' directory in a GitLab repository view on the right. The GitLab view shows the repository structure, including a sidebar with navigation options like 'Project information', 'Repository', 'Issues', and 'Merge requests'. The main content area displays the 'assays' directory with a commit history table.

Name	Last commit	Last update
..		
└ AffinityPurification	update analysis	20 hours ago
└ Biotinylation	update analysis	20 hours ago
└ MSAnalysis	update analysis	20 hours ago
└ MSMeasurement	update analysis	20 hours ago
└ Western	update analysis	20 hours ago
└ .gitkeep	Initial Commit	6 days ago

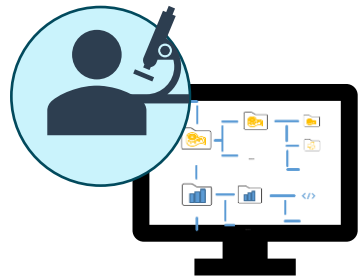


Researcher A

Now: Using the PLANTDataHUB to collaborate

The image shows a workflow from a local file system to a cloud-based repository. On the left, a file explorer window displays the contents of a folder named 'TurboIDSampleArc'. The files and folders listed are: .arc, .git, assays, runs, studies, workflows, .gitattributes, .gitignore, isa.investigation.xlsx, and README.md. A blue icon with a leaf and a bar chart is overlaid on the file explorer. An arrow points from this icon to the 'pipeline' button in the GitLab repository page. The GitLab page shows the 'TurboIDWorkshop' repository with 7 commits, 1 branch, 0 tags, and 40.4 MB of project storage. The 'pipeline' button is highlighted with a blue box. Below the repository information, there is an 'update analysis' section with a commit hash 'd65eda6b'. A table lists the files and their last commit information.

Name	Last commit	Last update
assays	update analysis	19 hours ago
runs	update analysis	19 hours ago
studies	update analysis	19 hours ago
workflows	add executable Workflow	22 hours ago
.gitattributes	update analysis	19 hours ago
.gitignore	Initial Commit	6 days ago
isa.investigation.xlsx	update analysis	19 hours ago



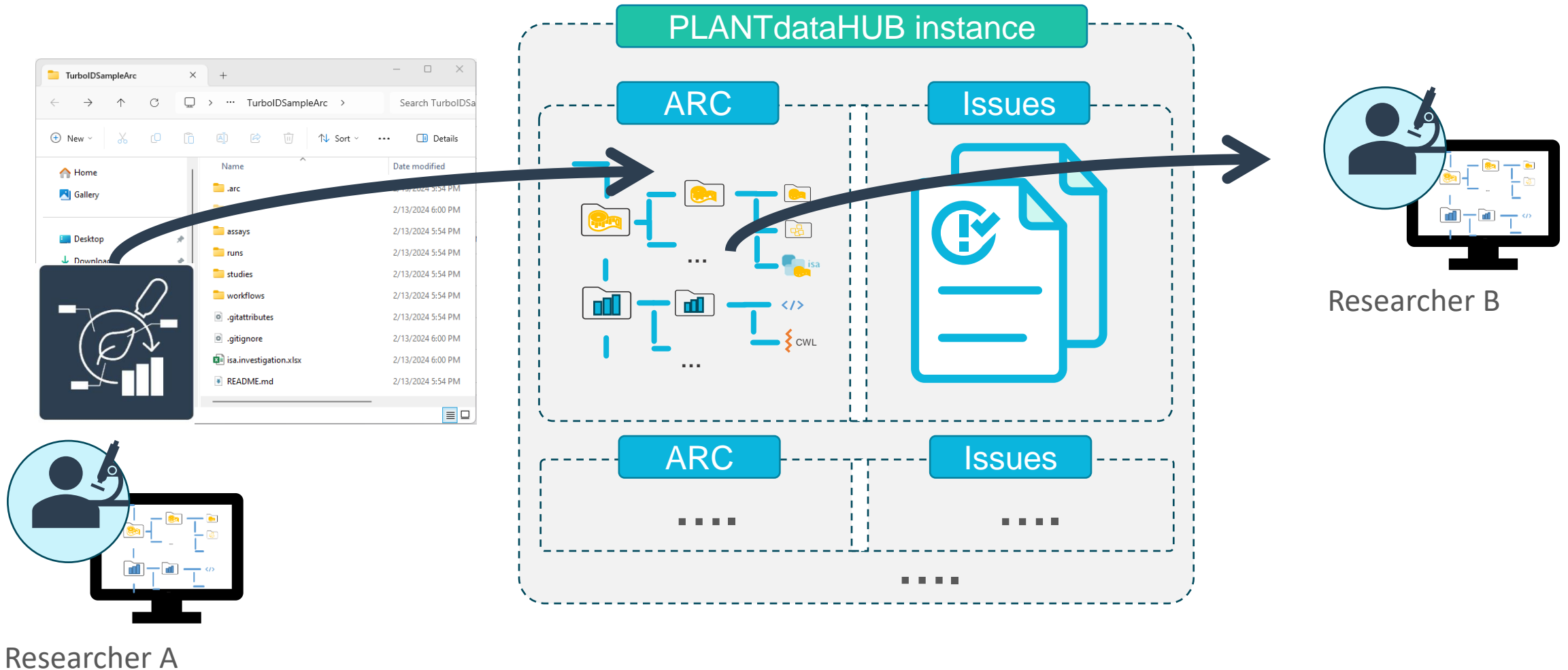
Researcher A

Now: Using the PLANTDataHUB to collaborate

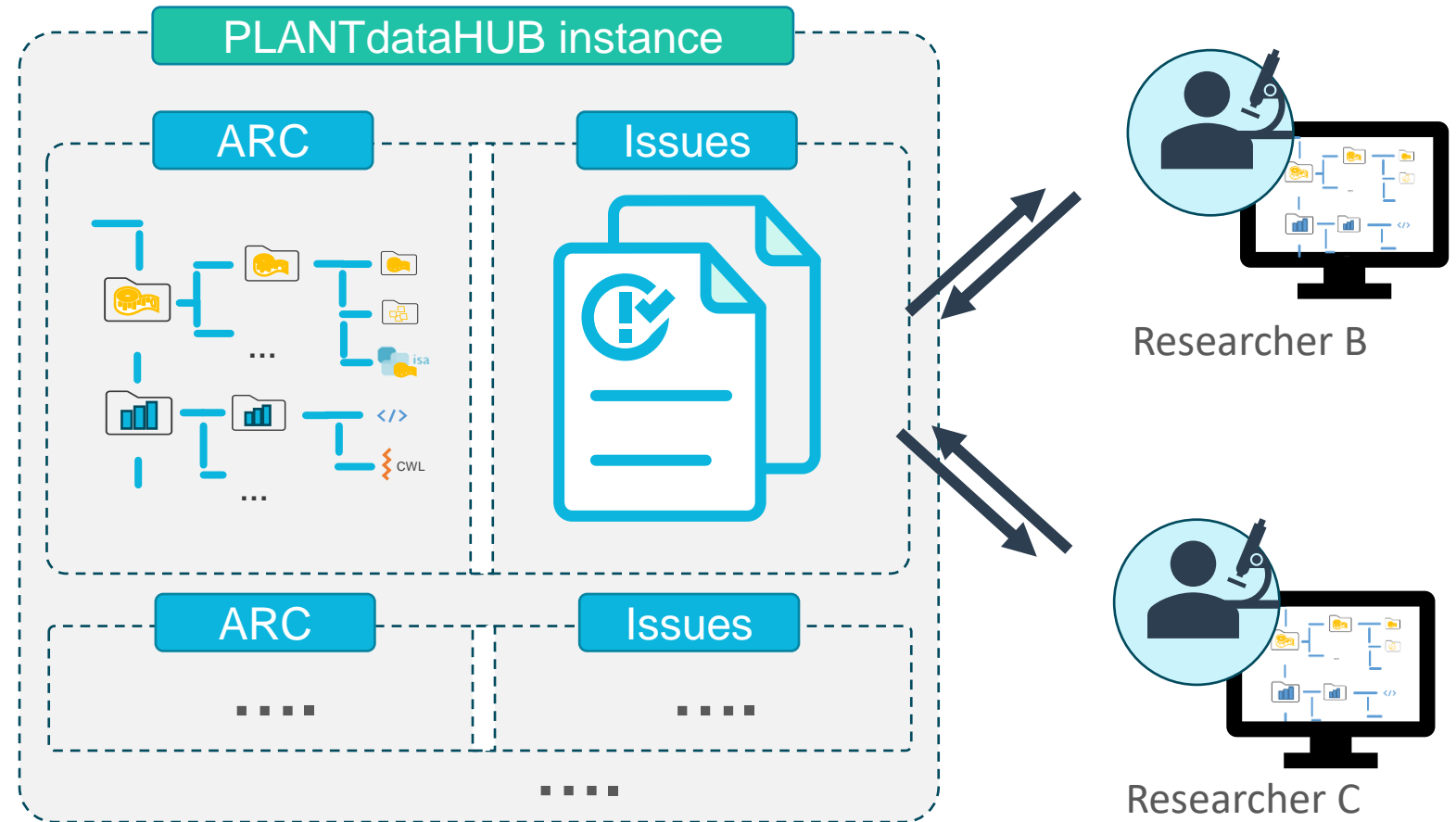
The image shows a workflow for collaboration. On the left, a file explorer window displays the contents of a directory named 'TurboIDSampleArc'. The files listed include folders like '.arc', '.git', 'assays', 'runs', 'studies', and 'workflows', along with files such as '.gitattributes', '.gitignore', 'isa.investigation.xlsx', and 'README.md'. A blue icon with a leaf and a bar chart is overlaid on the file explorer. An arrow points from the 'README.md' file to a specific commit in a GitLab repository. The GitLab page shows the commit history for the 'TurboIDWorkshop' repository. The commit 'update analysis' by David Zimmer, authored 20 hours ago, is highlighted with a blue box. Other commits include 'add executable Workflow', 'add meta data, add workflow', 'add legacy workflow', 'add meta data', 'Initial Structure and data', and 'Initial Commit'. A researcher icon is located at the bottom left of the image.

Researcher A

Now: Using the PLANTDataHUB to collaborate



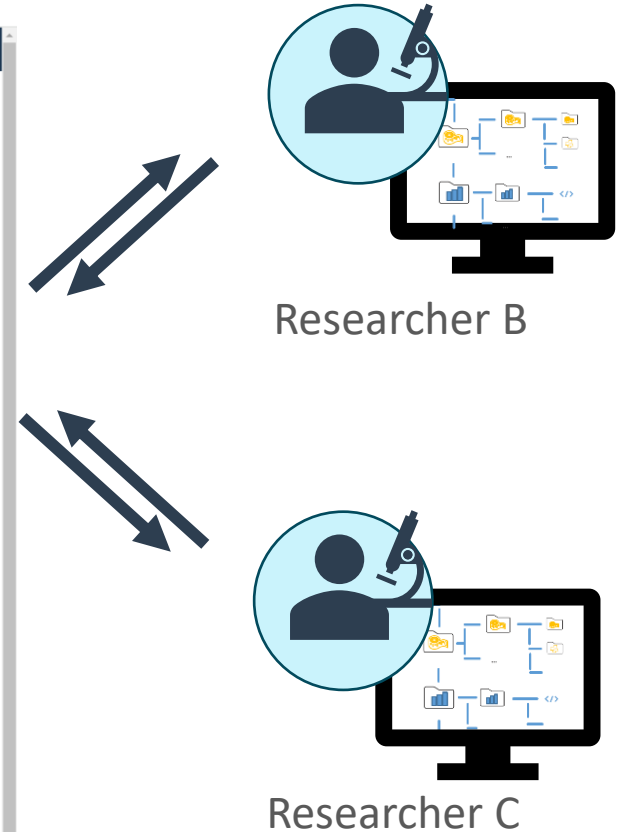
Now: Using the PLANTDataHUB to collaborate



Now: Using the PLANTDataHUB to collaborate

The screenshot shows a GitLab repository page for 'TurboIDWorkshop' by David Zimmer. The repository has 7 commits, 1 branch, and 0 tags. A recent commit 'update analysis' is highlighted, showing a CI/CD pipeline status of 'unknown' and a commit hash of 'd65eda6b'. The repository contains several files and folders, including 'assays', 'runs', 'studies', 'workflows', '.gitattributes', '.gitignore', and 'isa.investigation.xlsx'. The 'Issues' tab in the left sidebar is highlighted with a blue box.

Name	Last commit	Last update
assays	update analysis	19 hours ago
runs	update analysis	19 hours ago
studies	update analysis	19 hours ago
workflows	add executable Workflow	22 hours ago
.gitattributes	update analysis	19 hours ago
.gitignore	Initial Commit	6 days ago
isa.investigation.xlsx	update analysis	19 hours ago



Now: Using the PLANTDataHUB to collaborate

Issues · David Zimmer / TurbolDWorkshop

gedächtnis englisch - Google S

git.nfdi4plants.org/zimmer/TurbolDWorkshop/-/issues

Search GitLab

TurbolDWorkshop

- Project information
- Repository
- Issues 2
- List
- Boards
- Service Desk
- Milestones
- Merge requests 0
- CI/CD
- Security & Compliance
- Deployments
- Packages and registries
- Infrastructure
- Monitor
- Analytics
- Wiki
- Snippets
- Settings

David Zimmer > TurbolDWorkshop > Issues

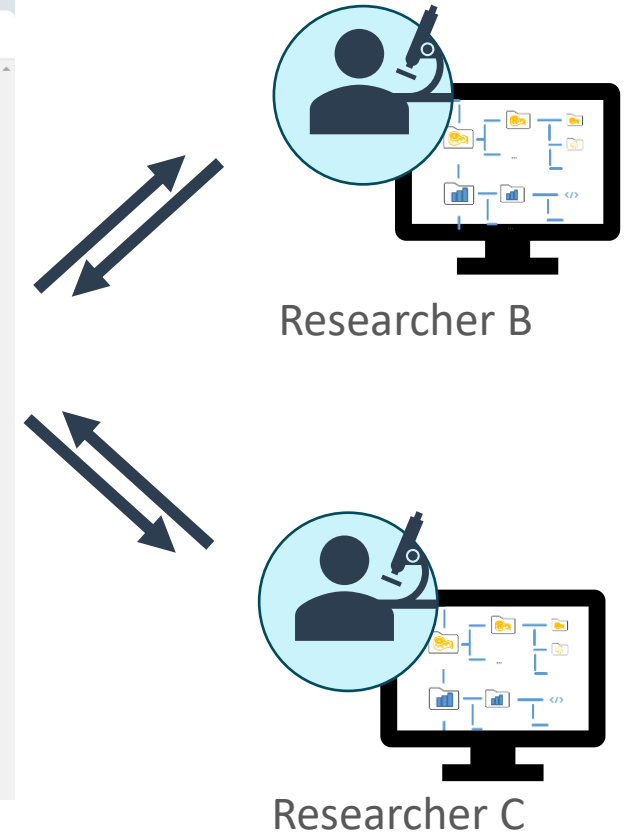
Open 2 Closed 1 All 3

Search or filter results...

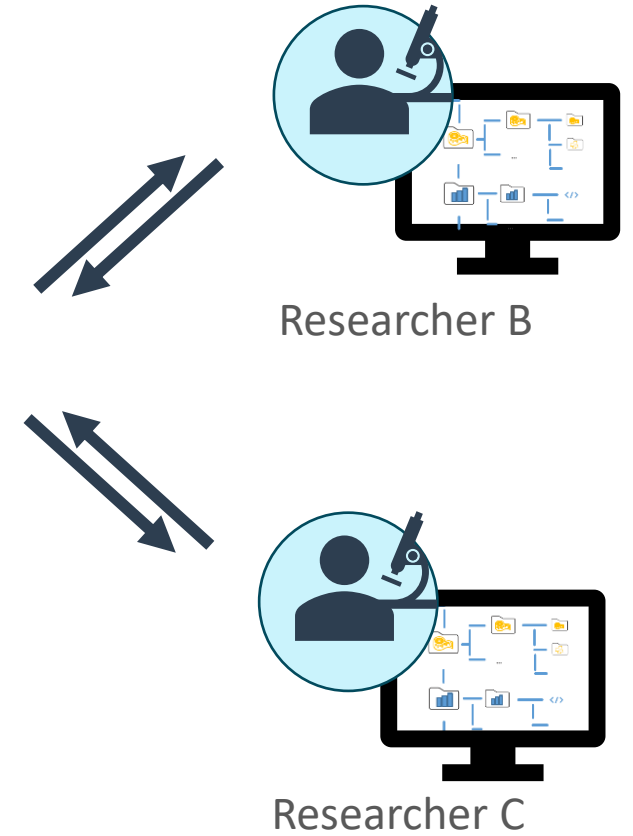
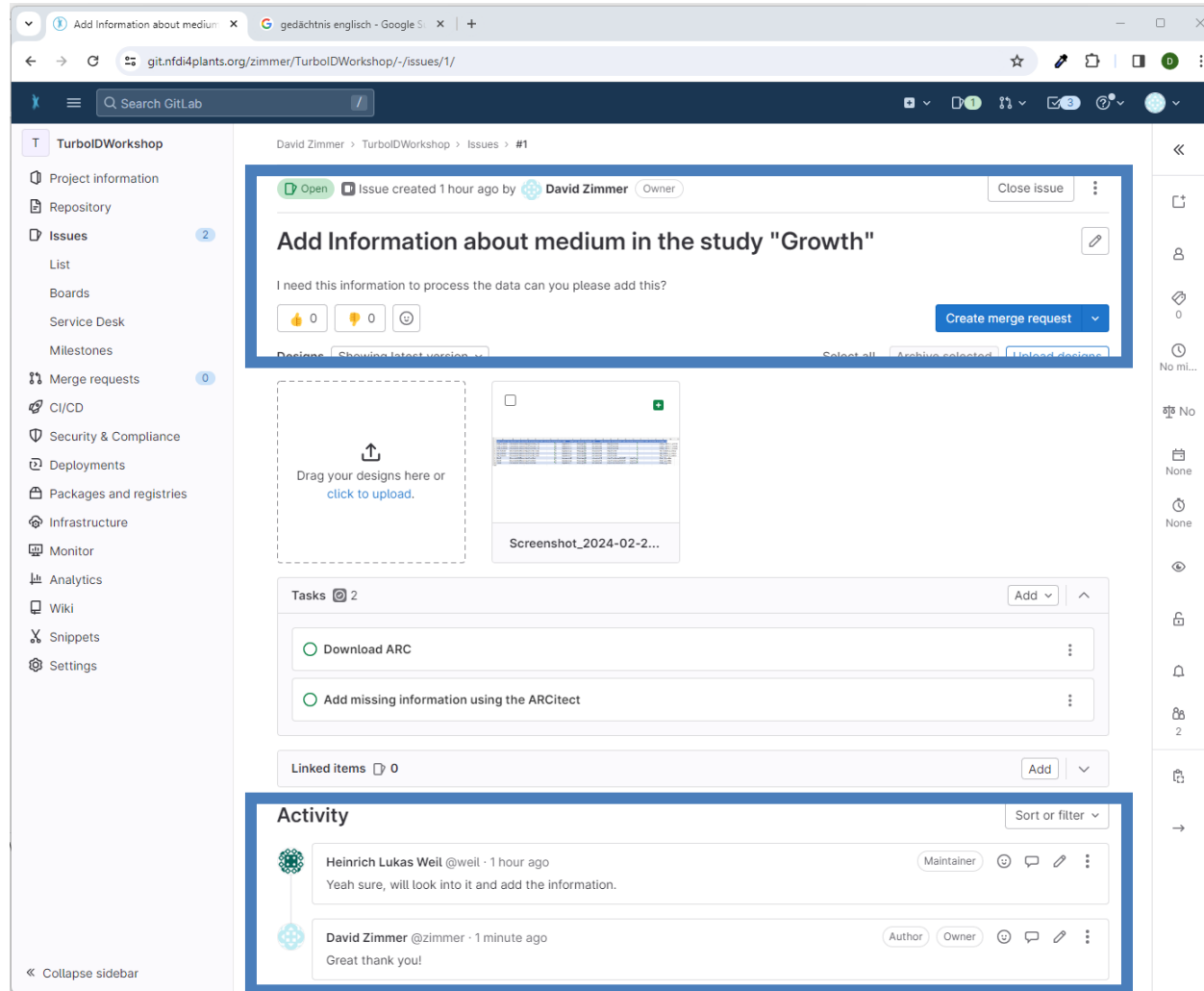
Created date

Ideas for complementary experiments

- #3 · created 1 hour ago by Heinrich Lukas Weil updated 1 hour ago
- Add Information about medium in the study "Growth"**
- #1 · created 1 hour ago by David Zimmer updated 1 hour ago

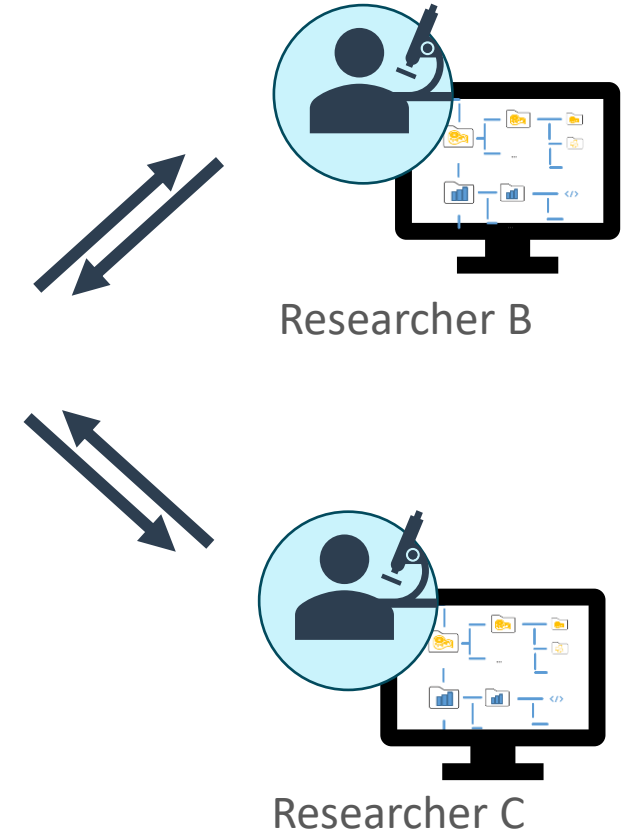


Now: Using the PLANTDataHUB to collaborate



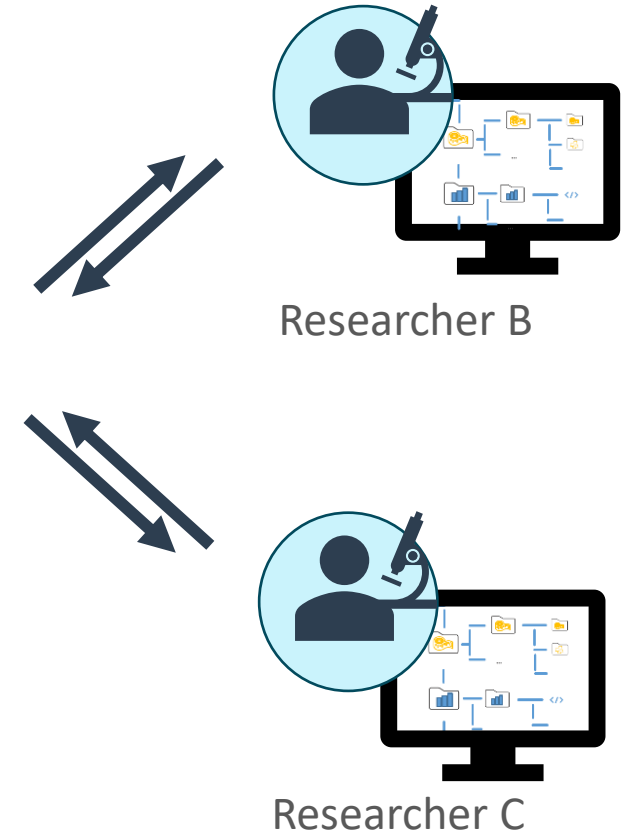
Now: Using the PLANTDataHUB to collaborate

The screenshot shows a GitLab issue page for the project 'TurbolDWorkshop'. The issue title is 'Add Information about medium in the study "Growth"'. The issue was created 1 hour ago by David Zimmer (Owner). The issue description reads: 'I need this information to process the data can you please add this?'. Below the description, there are buttons for 'Create merge request' and 'Upload designs'. A 'Tasks' section is highlighted with a blue box, containing two tasks: 'Download ARC' and 'Add missing information using the ARCitect'. The 'Activity' section shows a comment from Heinrich Lukas Weil (@weil) 1 hour ago: 'Yeah sure, will look into it and add the information.' and a reply from David Zimmer (@zimmer) 1 minute ago: 'Great thank you!'. The left sidebar shows the project navigation menu, and the right sidebar shows the issue's metadata and actions.

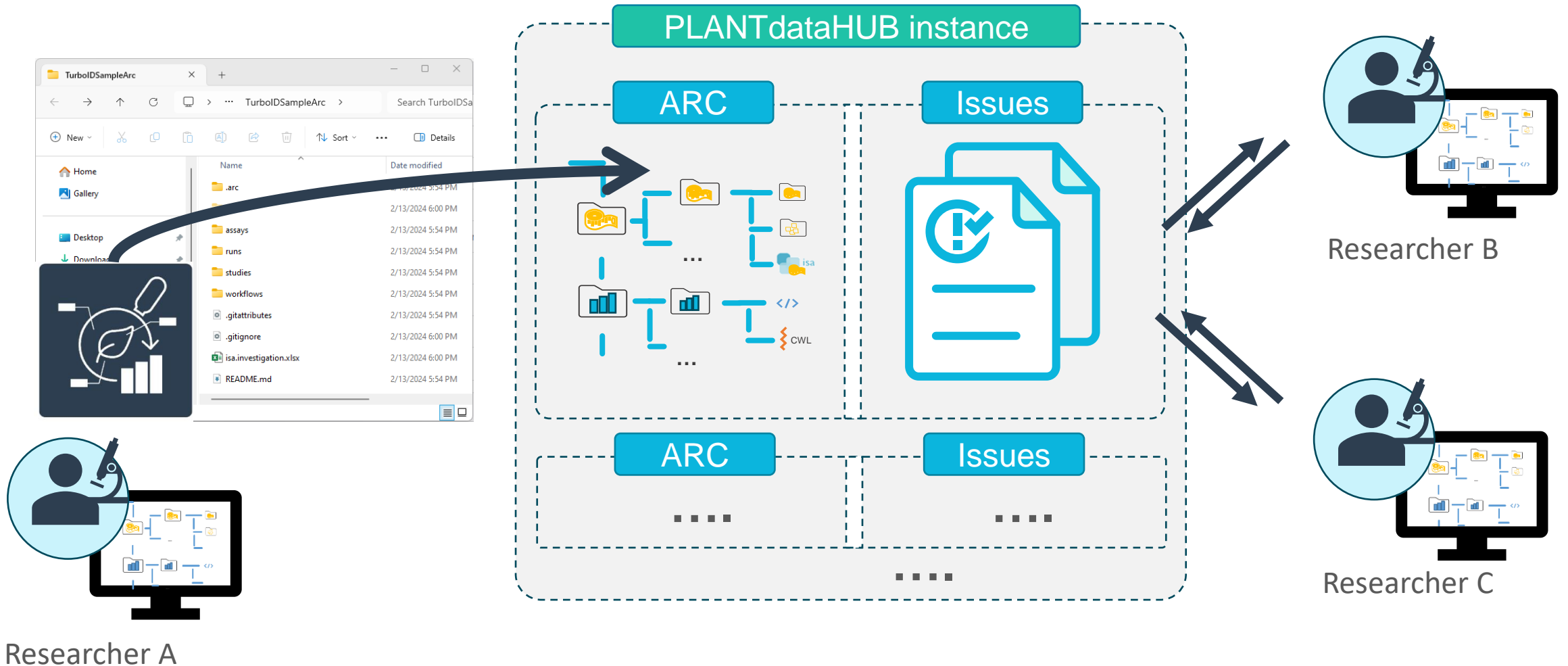


Now: Using the PLANTDataHUB to collaborate

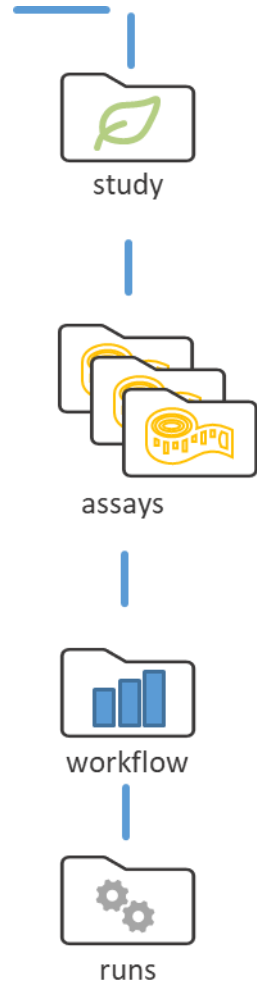
The screenshot shows a GitLab web interface for a project named 'TurboIDWorkshop'. The main content area displays a milestone titled 'finalize first Version' with a progress indicator of 33%. Below the milestone title, there is a notification box that reads: 'Improve milestones with Burndown Charts. Burndown Charts are visual representations of the progress of completing a milestone. At a glance, you see the current state for the completion a given milestone. Without them, you would have to organize the data from the milestone and plot it yourself to have the same sense of progress. Read more. Contact your Administrator to upgrade your license.' The interface also shows a sidebar with navigation options, including 'Milestones' which is highlighted with a blue box. At the bottom, there are three issue status boxes: 'Unstarted Issues (open and unassigned)' with 2 items, 'Ongoing Issues (open and assigned)' with 0 items, and 'Completed Issues (closed)' with 1 item. One completed issue is listed as 'Analysis request #2'.



Now: Using the PLANTDataHUB to collaborate



Agenda of part two



- I. Important ARC concepts by example: Structure
- II. Important ARC concepts by example: Meta Data Annotation Principle
- III. ARCs for FAIR collaboration using the PLANTDataHUB



IV. Complete Walk-Through using the ARCitect

IV: Prerequisites

- Create an DataPLANT Account:
 - Visit: <https://git.nfdi4plants.org/explore>
 - Click “Sign in”
 - Either connect your ORCID account or create an DataPLANT account using “SIGN UP”
- Download the Arcitect:
 - This tutorial is performed using Arcitect version 0.0.28 newer versions might be available but might have an different look
 - The software is still at an early state, if you find bugs and want to help, please report your bugs [here](#)
- Optional: Have a look at the NFDI4Plants [Knowledgebase](#)

Agenda

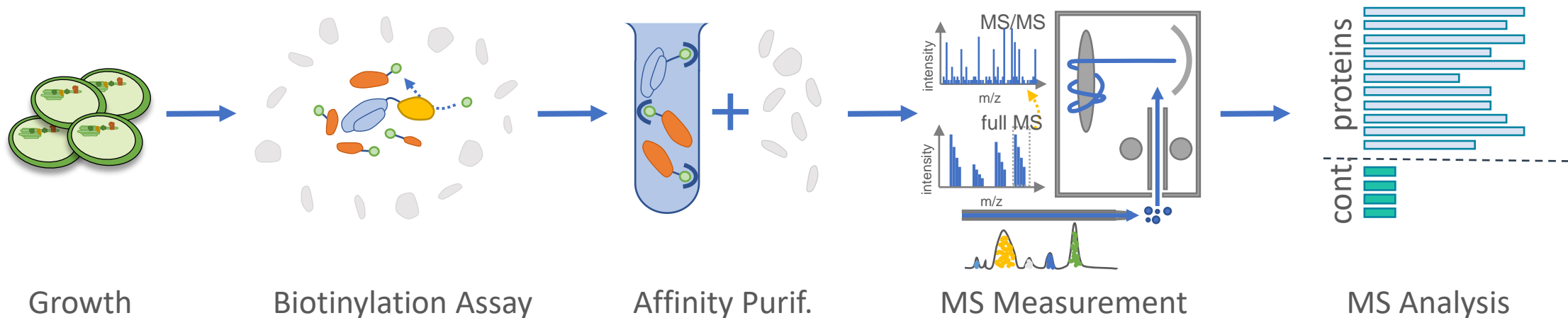
- I. Initialize ARC structure and add data
- II. Add Meta Data
- III. Login to the DataHUB and synchronize our ARC
- IV. Explore the ARC online
- V. Execute an workflow in the ARC

I. Initialize ARC structure and add data

- Open the Arcitect
- Create a new ARC

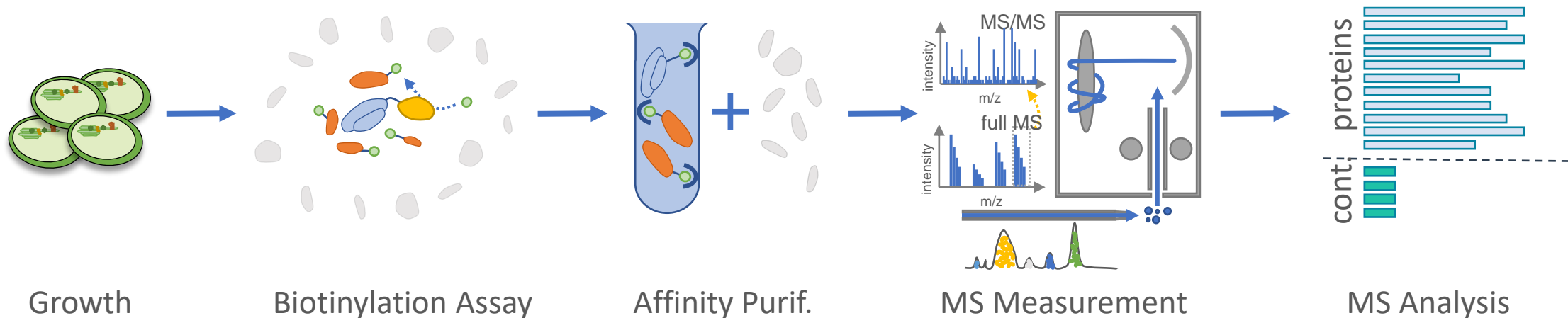
I. Initialize ARC structure and add data

- Inspect our experiment and layout the ARC accordingly
 - Add one study called growth



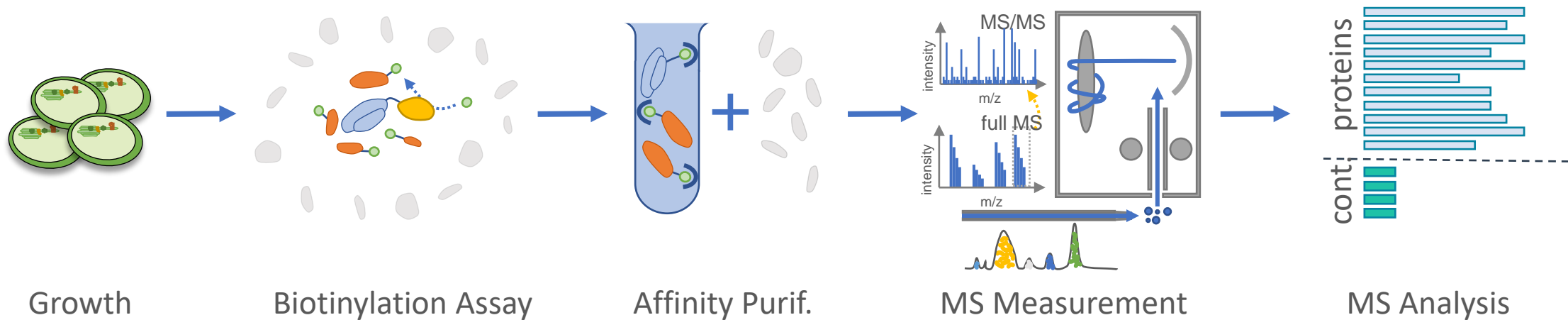
I. Initialize ARC structure and add data

- Inspect our experiment and layout the ARC accordingly
 - Add one study called growth
 - Add four Assays called “Biotinylation”, “AffinityPurification”, “MS Measurement” and “MS Analysis”



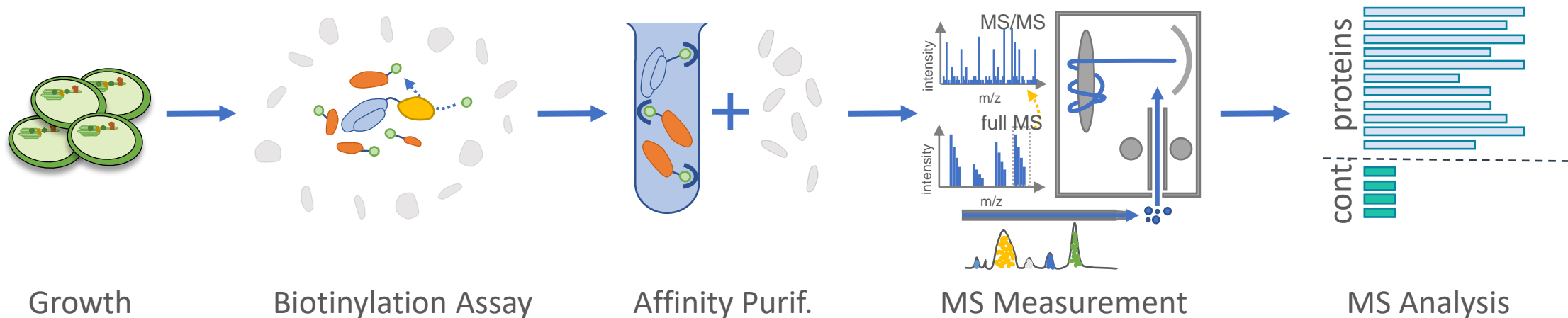
I. Initialize ARC structure and add data

- Add our experimental data
 - Add MS raw data to the assay MSMeasurement



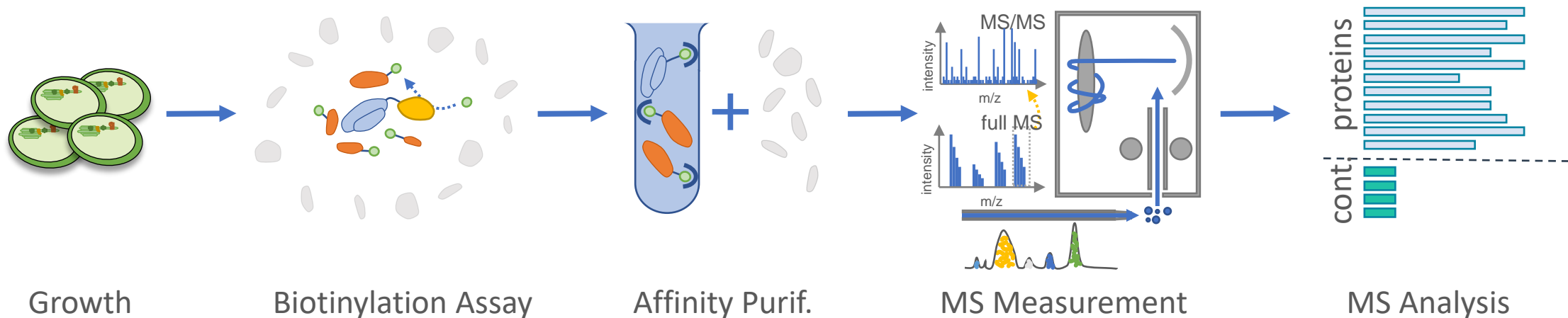
I. Initialize ARC structure and add data

- Add our experimental data
 - Add MS raw data to the assay MSMeasurement
 - Add MS analysis data to the MSAnalysis assay



I. Initialize ARC structure and add data

- Add our experimental data
 - Add MS raw data to the assay MSMeasurement
 - Add MS analysis data to the MSAnalysis assay



Agenda

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 - Add your Samples named “RBCL_TurboID_1_preExp”, “RBCL_TurboID_2_preExp” etc.

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 - Add the columns Parameter [temperature], Parameter [light intensity exposure] and Parameter [Biological replicate] to describe the process that produced our samples in the output column

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II. Add Meta Data

- Add Meta Data to the assay “Biotinylation”
- Visit the Assay “Biotinylation” and add a new workbook and name it “Biotinylation”
- Add an Input [Source Name] Column and and Output [Sample Name] Column

II. Add Meta Data

- Add Meta Data to the assay “Biotinylation”

Growth/isa.study.xlsx

Input [Source Name]	Characteristic [organism]	Characteristic [biological replicate group]	Parameter [temperature]	Output [Sample Name]
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_1_preExp
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_2_preExp
RBCL_TurboID	Chlamydomonas reinhardtii	RBCL_TurboID	24	RBCL_TurboID_3_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_1_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_2_preExp
FBP_TurboID	Chlamydomonas reinhardtii	FBP_TurboID	24	FBP_TurboID_3_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_1_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_2_preExp
Cher4	Chlamydomonas reinhardtii	Control Group	24	Cher4_3_preExp

Biotinylation/isa.assay.xlsx

Input [Sample Name]	Parameter [temperature]	Parameter [light intensity exposure]	Parameter [Biotin-phenol]	Output [Sample Name]
RBCL_TurboID_1_preExp	24	60	100	RBCL_TurboID_1_postBio
RBCL_TurboID_2_preExp	24	60	100	RBCL_TurboID_2_postBio
RBCL_TurboID_3_preExp	24	60	100	RBCL_TurboID_3_postBio
FBP_TurboID_1_preExp	24	60	100	FBP_TurboID_1_postBio
FBP_TurboID_2_preExp	24	60	100	FBP_TurboID_2_postBio
FBP_TurboID_3_preExp	24	60	100	FBP_TurboID_3_postBio
Cher4_1_preExp	24	60	100	Cher4_1_postBio
Cher4_2_preExp	24	60	100	Cher4_2_postBio
Cher4_3_preExp	24	60	100	Cher4_3_postBio

AffinityPurification/isa.assay.xlsx

Input [Sample Name]	Parameter [affinity column]	Parameter [Buffer]	Parameter [Biotin]	Output [Sample Name]
RBCL_TurboID_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_1_eluate
RBCL_TurboID_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_2_eluate
RBCL_TurboID_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	RBCL_TurboID_3_eluate
FBP_TurboID_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_1_eluate
FBP_TurboID_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_2_eluate
FBP_TurboID_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	FBP_TurboID_3_eluate
Cher4_1_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_1_eluate
Cher4_2_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_2_eluate
Cher4_3_postBio	Streptavidin	2x SDS Laemmli buffer with biotin	100	Cher4_3_eluate

II. Add Meta Data

- Add Meta Data to the assay “Biotinylation”
- Visit the Assay “Biotinylation” and add a new workbook and name it “Biotinylation”

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- Add Meta Data!

II. Add Meta Data

- Repeat for all assays
- ... or inspect the prepared ARC called “LiveARC_WithMetaData”

II. Add Meta Data

- Repeat for all assays
- ... or inspect the prepared ARC called “LiveARC_WithMetaData”
- Use the file picker to add file references to assays

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- Repeat for all assays
- ... or inspect the prepared ARC called “LiveARC_WithMetaData”
- Use the file picker to add file references to assays
- Inspect the Output of the assay “AffinityPurification” and how it maps to the assay “Western Plot”

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III. Login to the DataHUB and synchronize our ARC

- Login to your DataPLANT account
- Commit our changes locally
- Sync our new Commit with the DataHUB

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IV. Explore the ARC online

- Visit the [DataHUB](#) and identify your ARC
- Explore your ARC structure
- Inspect your Commits

IV. Explore the ARC online

- Visit the [DataHUB](#) and identify your ARC
- Explore your ARC structure
- Inspect your Commits
- Make local changes and sync again
- Inspect your Commits

IV. Explore the ARC online

- Visit the [DataHUB](#) and identify your ARC
- Explore your ARC structure
- Inspect your Commits
- Make local changes and sync again
- Inspect your Commits
- Create an issue
- Create an milestone

Agenda

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V. Execute an workflow in the ARC

- Add the workflow and the run parameters using the ARCCitect
- Execute the workflow using cwltool as described [here](#)