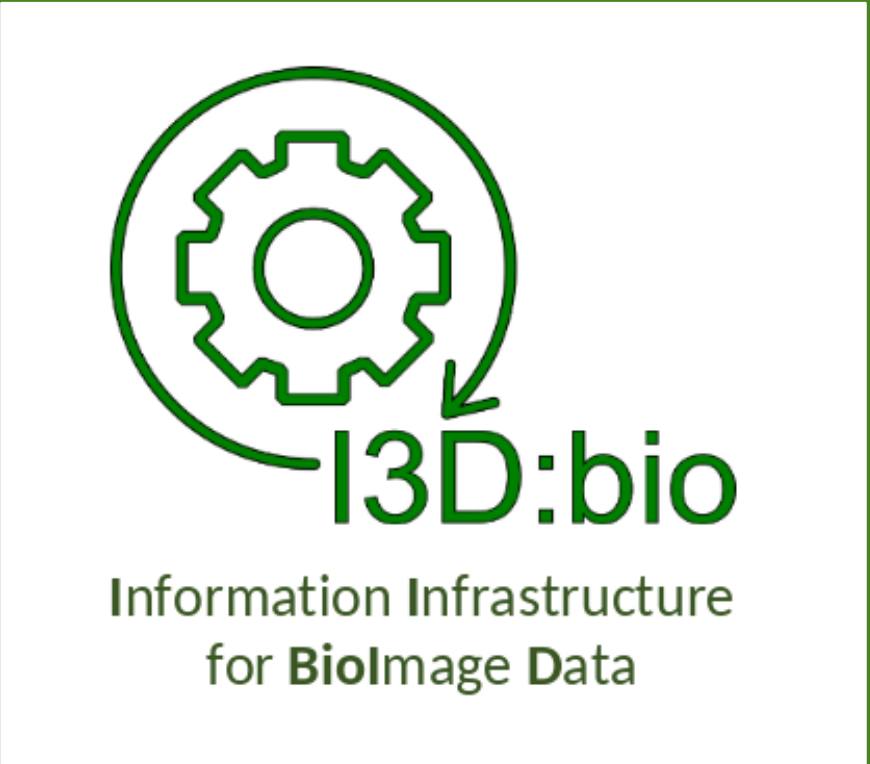


The Information Infrastructure for BioImage Data (I3D:bio) project to advance FAIR microscopy data management for the community



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Research data management (RDM) in microscopy and image analysis is a challenging task. Large files in proprietary formats, complex N-dimensional array structures, and various metadata models and formats can make image data handling inconvenient and difficult. For data organization, annotation, and sharing, researchers need solutions that fit everyday practice and comply with the FAIR (Findable, Accessible, Interoperable, Reusable) principles. International community-based efforts have begun creating open data models (OME), an open file format and translation library (OME-TIFF, Bio-Formats),

data management software platforms, and microscopy metadata recommendations and annotation tools. Bringing these developments into practice requires support and training. Iterative feedback and tool improvement is needed to foster practical adoption by the scientific community. The *Information Infrastructure for BioImage Data (I3D:bio)* project works on guidelines, training resources, and practical assistance for FAIR microscopy RDM adoption with a focus on the management platform OMERO and metadata annotations.

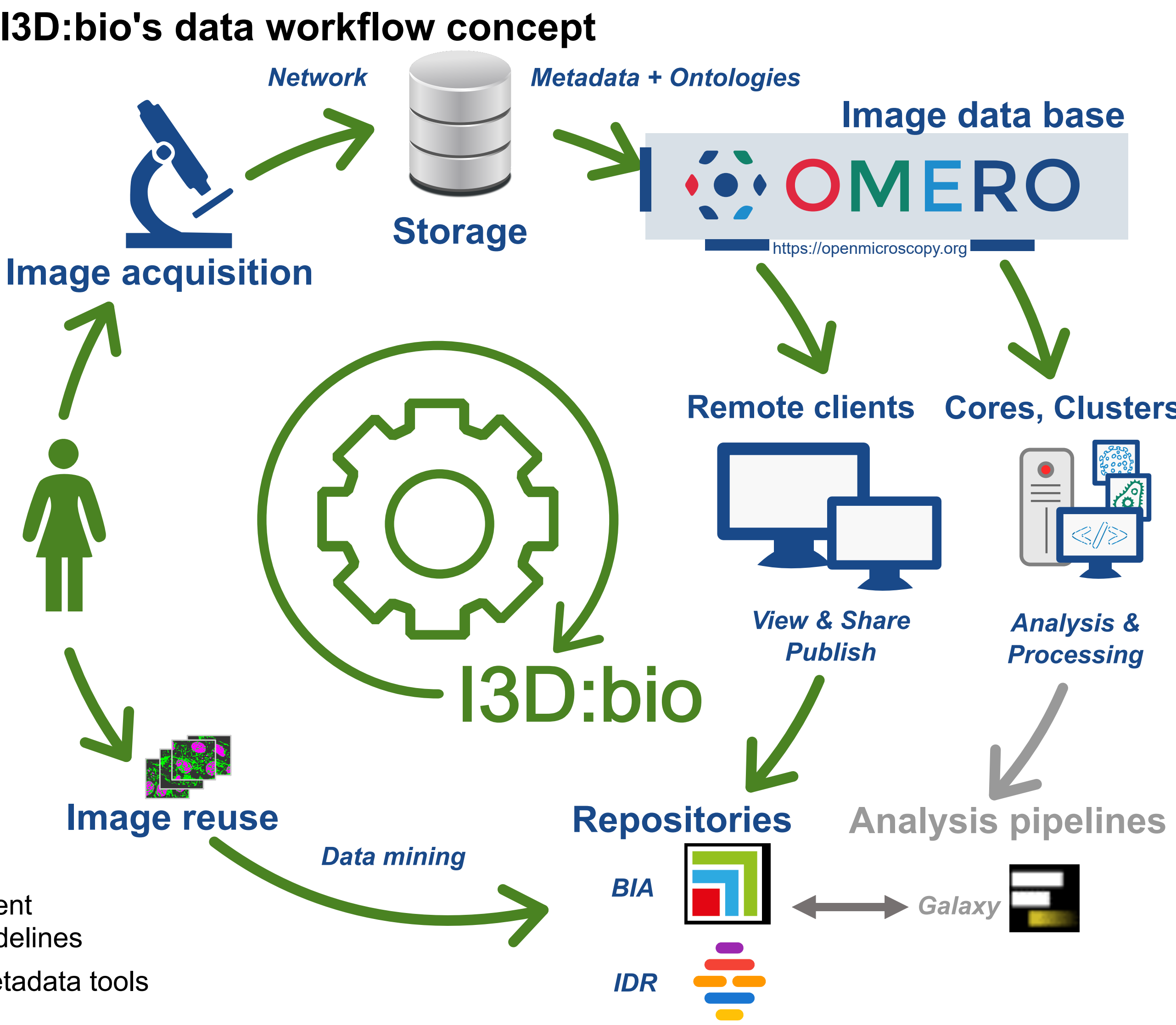
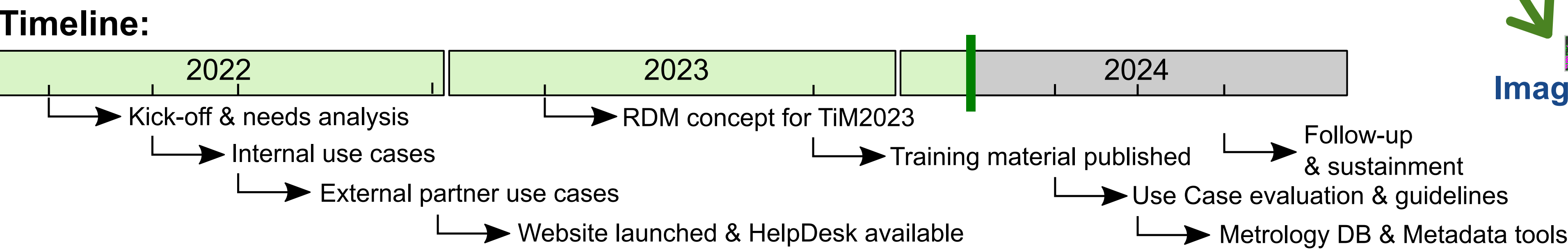
What is I3D:bio?

Project goals and support offers:

- I3D:bio recommendations & guidelines for institutional OMERO installations
- Training material & workshops for the bioimaging community
- Testing and refining metadata annotation tools (in particular MDEmic) *Reference: 1)*
- A reference database for microscopy metrology data based on OMERO
- A web resource as an easy entry-point for bioimaging RDM with OMERO

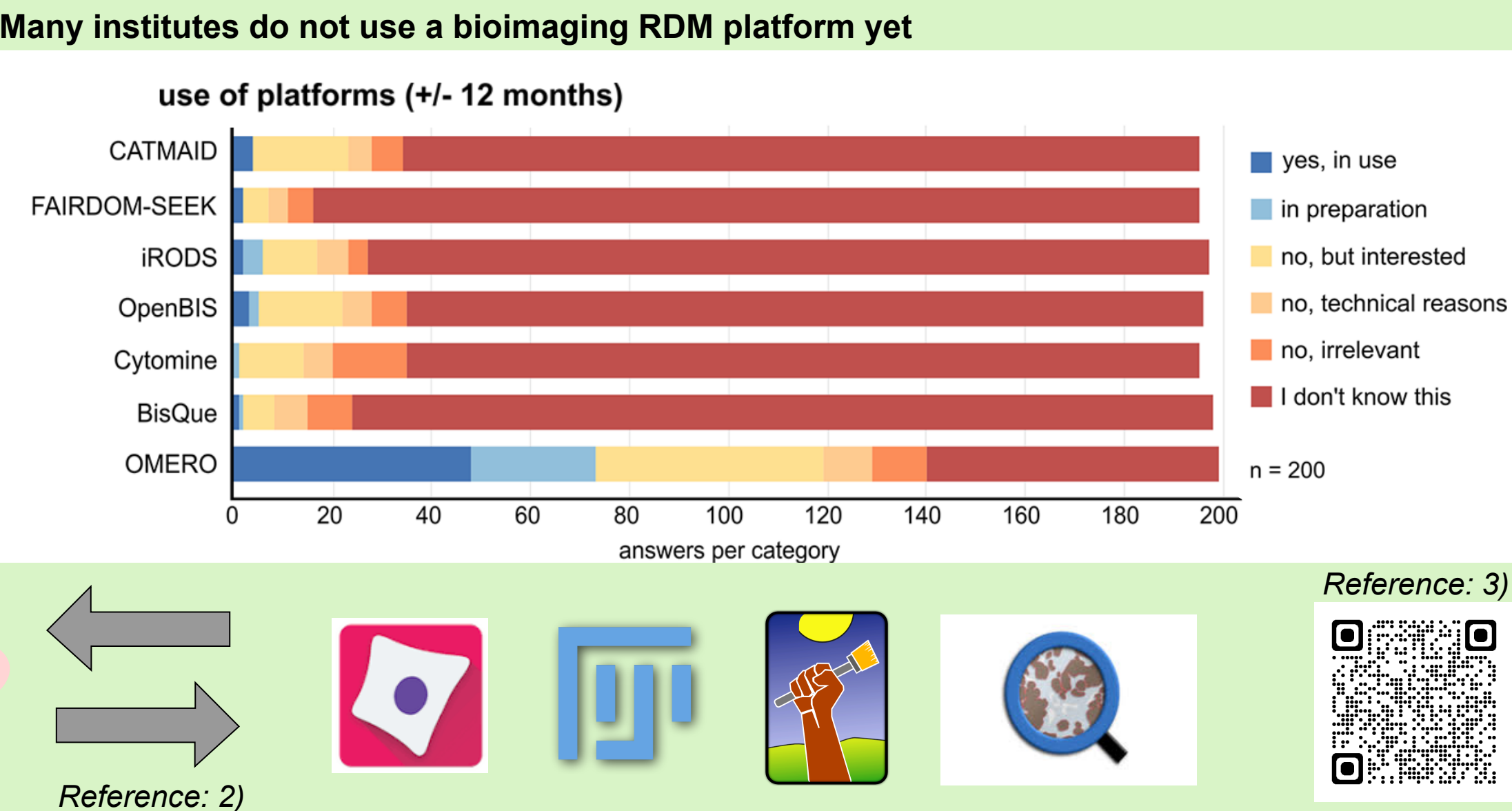
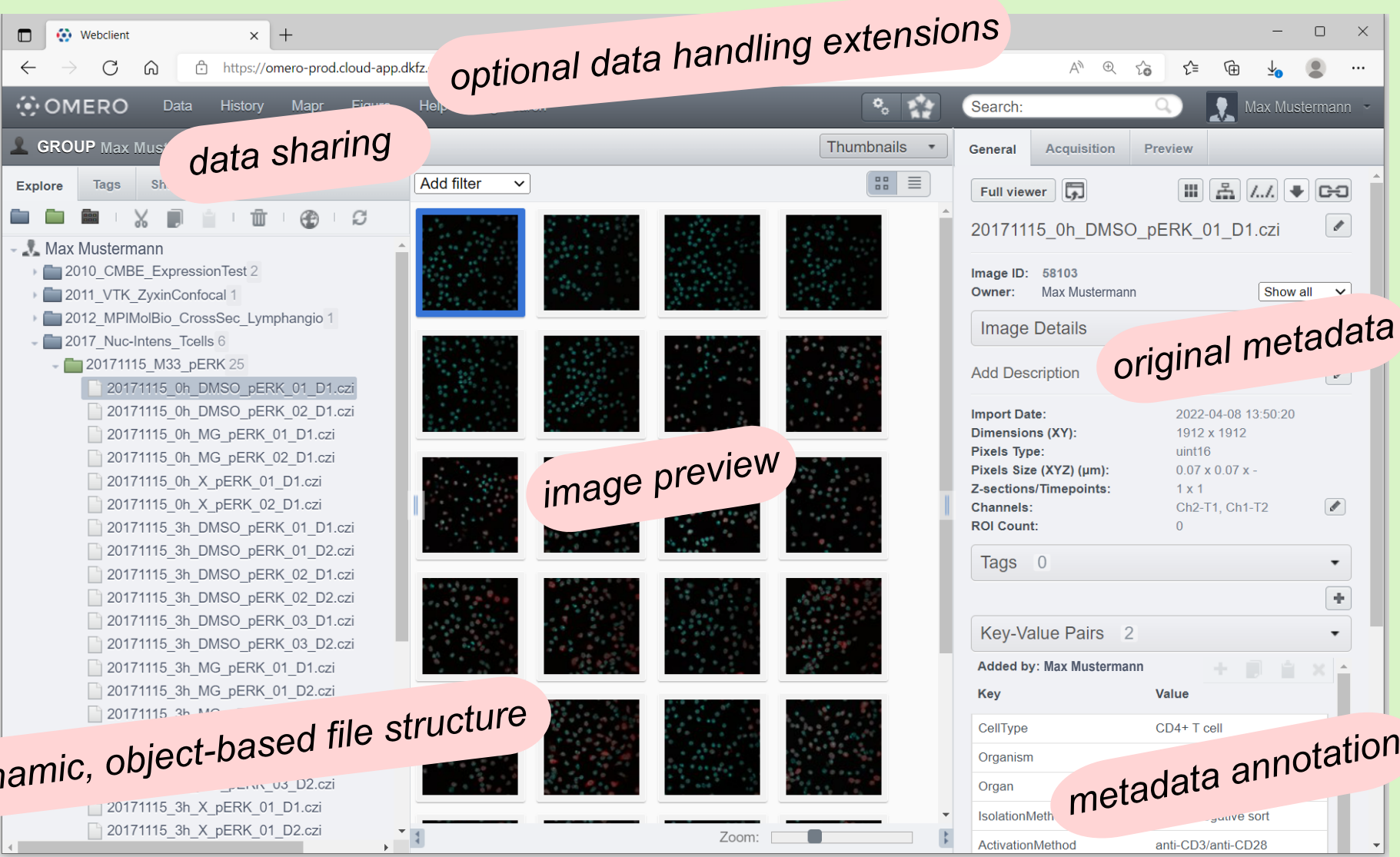
(Inter-)national collaboration to align standards and recommendations:
Germany: German Biolmaging, Nationale Forschungsdateninfrastruktur (NFDI)
Europe & beyond: Euro-Biolmaging, Global Biolmaging, GloBIAS, BINA, etc.

Use Case collaboration for bioimaging RDM at applicant's & partner's sites
Primary case: TU Dresden Medical Faculty Core Facility Cellular Imaging and BioPolis Dresden



Benefits for Imaging Core Facilities

Support for implementing OMERO



Training material & videos

Reusable slides and tutorials about OMERO and its use

Reference: 5a)

zenodo

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I3D:bio's OMERO training material: Re-usable, adjustable, multi-purpose slides for local user training

Reference: 5b)

I3D:bio's OMERO Training Videos: 01 - What is OMERO?

I3D:bio's OMERO Training Videos: 02 - Connect to OMERO

I3D:bio's OMERO Training Videos: 03 - OMERO software explained (optional chapter)

I3D:bio's OMERO Training Videos: 04 - User groups in OMERO

I3D:bio's OMERO Training Videos: 05 - Uploading data to OMERO

I3D:bio's OMERO Training Videos: 06 - Data organization in OMERO

Advancing structured metadata annotations for bioimage data usage

Getting more out of pixels

regions of interest

key-value pairs (REMBI style)

dataset

2023-05-10_third_replicate

tags

LM HEp2

2023-06-15_knockout_assay

detail

2023-08-28_EM_lipids_droplets_control

HeLa EM

Study component

Study component	Value
Imaging method	confocal laser scanning microscopy
Imaging method term accession number	http://purl.obolibrary.org/obo/CHMO_0000089
Imaging method term accession number source	REF
Biosample	
biological entity term accession number	HEp2 cells
biological entity term accession number source	REF
species	human
species term accession number	http://purl.obolibrary.org/obo/NCBITaxon_9606
species term accession number source	REF
Specimen	
preparation method	#EXP00114_20230615_CAI_Test_Staining_for_Practicals
staining	#EXP00114_20230615_CAI_Test_Staining_for_Practicals
channel1 - content	DAPI
channel1 - biological entity	DAPI
channel2 - content	DNA, mainly nucleus
channel2 - biological entity	phalloidin - 488
channel3 - content	filamentous Actin
channel3 - biological entity	anti-Tom20(mouse), anti-Mouse-AlexaFluorophore568
channel4 - content	mitochondrial import receptor
channel4 - biological entity	antiVimentin(rabbit), antiRabbit-StarRed
channel5 - content	intermediate filaments

Reference: 6)

Structuring of data and metadata in bioimaging

Video available!

<https://gerbi-gmb.de/i3dbio/i3dbio-resources/metadata-guide/>

Reference: 4)

Acknowledgement

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<https://www.i3dbio.de>

Research Data Management for Microscopy group (RDM4mic)
<https://german-bioimaging.github.io/>
[RDM4mic.github.io/](https://rdm4mic.github.io/)

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