

OME's Bio-Formats, OMERO & IDR:  
**OMERO & OME-Zarr**  
Fairy tale or Nightmare

Jean-Marie Burel

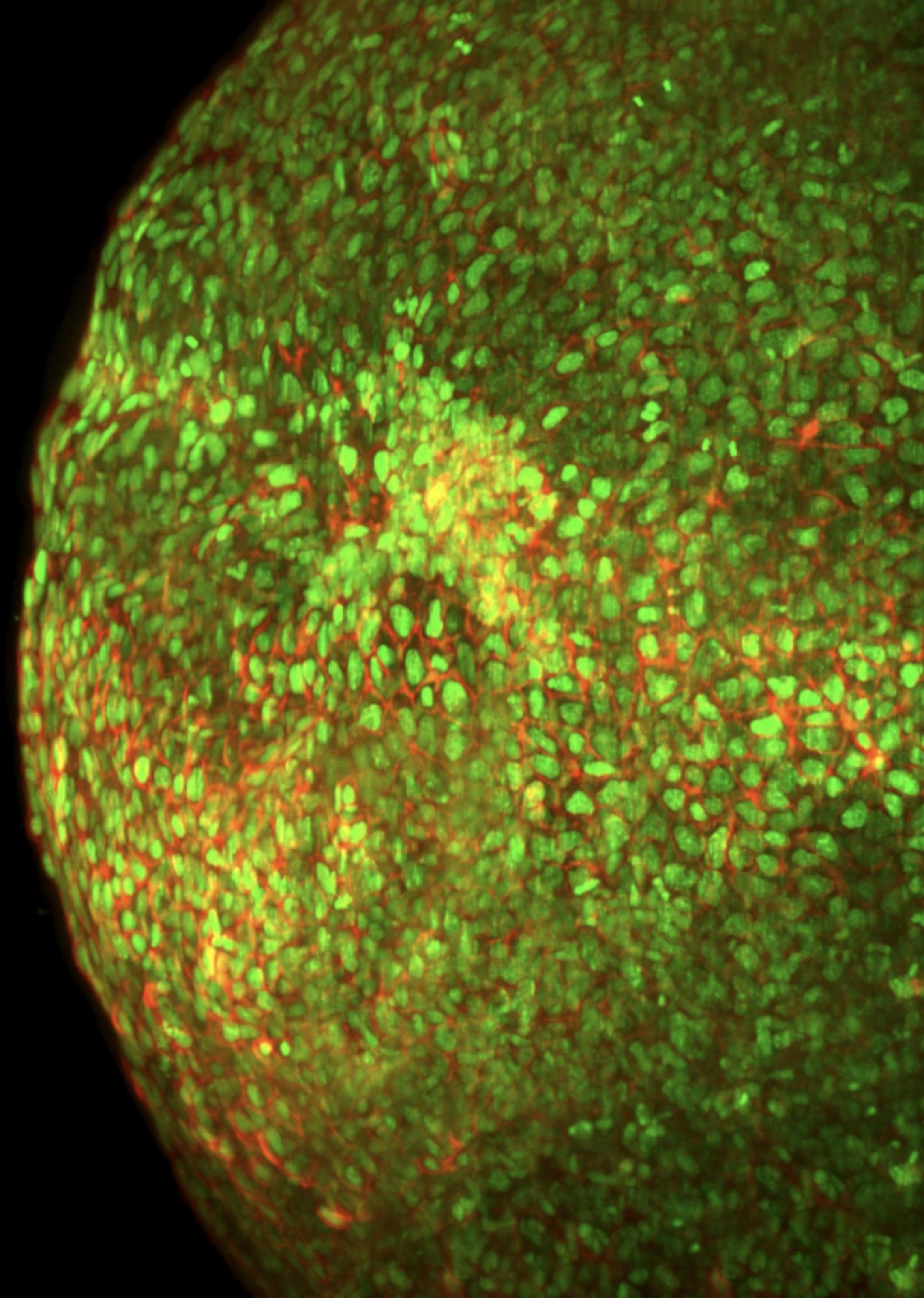
| UNIVERSITY OF DUNDEE

| OME

| BIOFAIR

@openmicroscopy

**OME 2026**  
**Düsseldorf, 28-30/04**



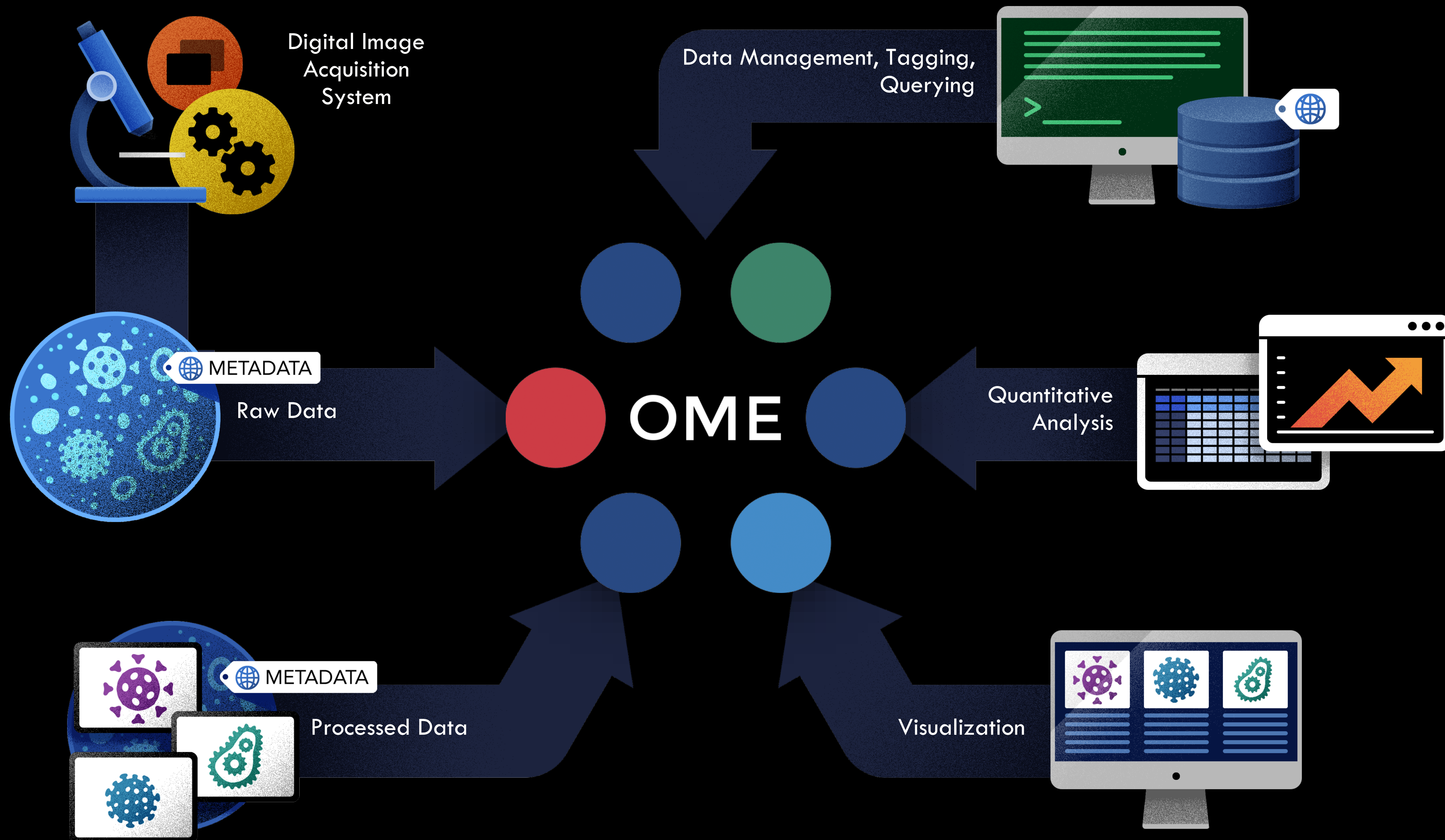


OME is an open-source ~~image~~ informatics project.

**NOT ONLY**

[openmicroscopy.org](https://openmicroscopy.org)







## OME Software



OME-TIFF

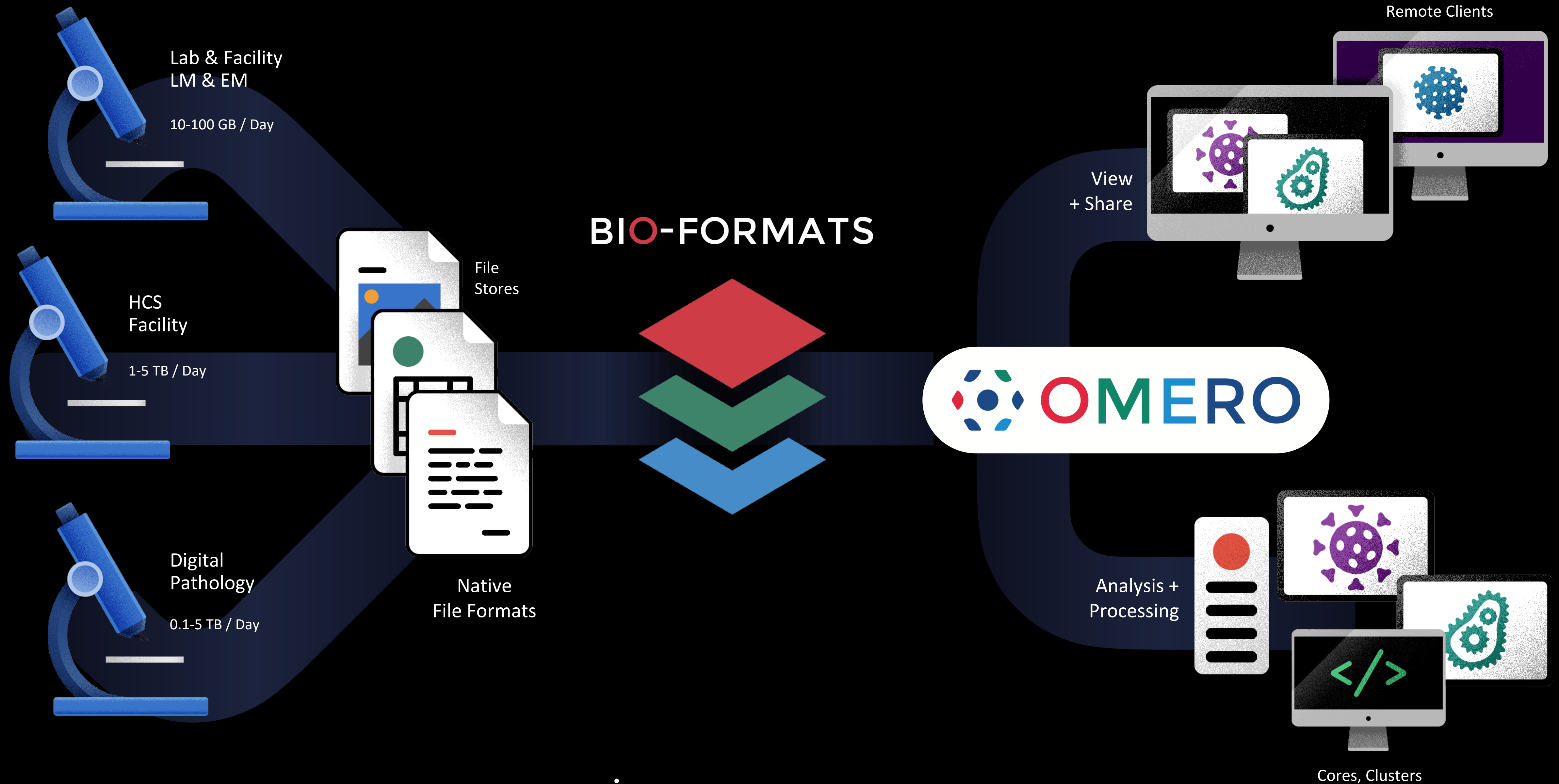
---

OME-NGFF

---



# Interfaces for Image Data Access @ Scale



[openmicroscopy.org](http://openmicroscopy.org)

Allan et al (2012) Nature Methods

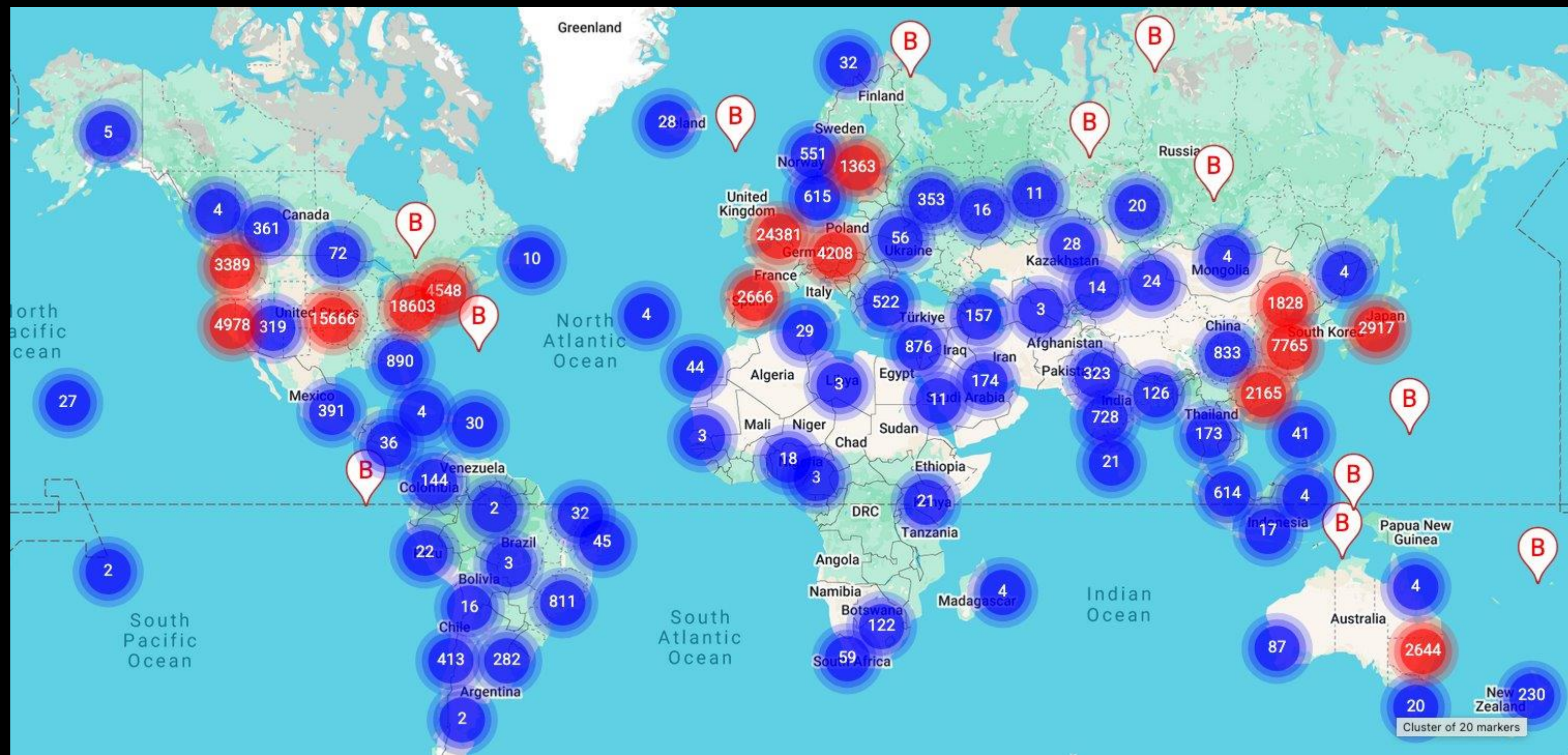


# Interoperability



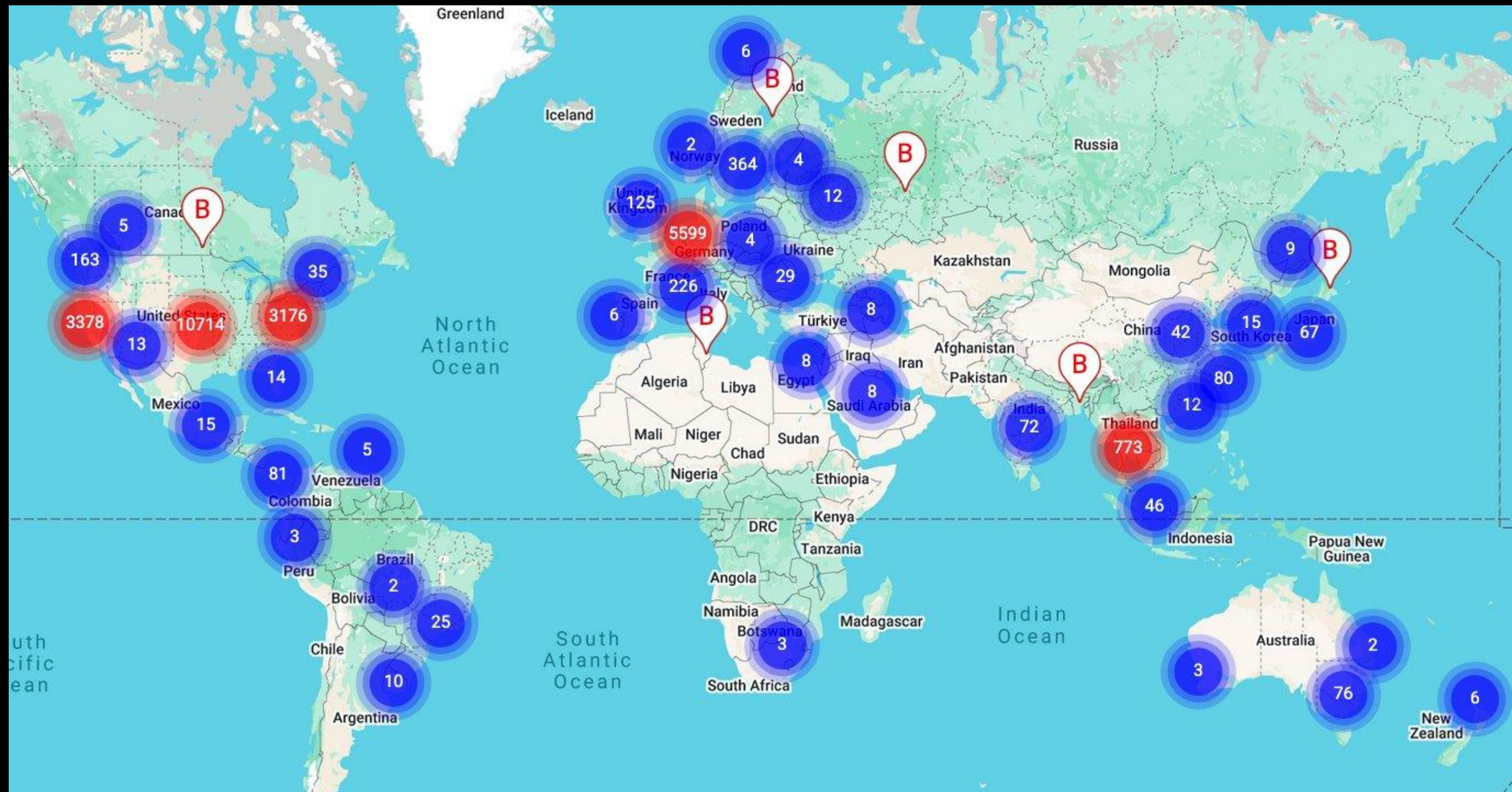


# BIO-FORMATS



Jan 2023- Jan 2026





Jan 2023- Jan 2026



# Outreach and Training

★ April 28 - May 1 2026

## OME 2026 Community Meeting

The OME 2026 Community Meeting will be held in Düsseldorf, Germany.

★ March 27 2026

## OMERO Workshop, Harvard University Faculty of Arts and Sciences

Online 1 day demo/workshop on how to use OMERO.

★ March 16 -20 2026

## IDR and OME-NGFF workshops, EMBL-EBI courses

Online practicals on OME-NGFF and IDR

📅 February 11 2026

## OMERO and OMERO.figure Workshop, LCI

Online 2 hour demo/workshop on how to use OMERO and OMERO.figure.

📅 December 4 - 5 2025

## OMERO workshop, CEITEC, Brno

In-person workshop on imaging workflows in OMERO.



openmicroscopy

@openmicroscopy

More pics from the great last week's OMERO workshop organized by [#CRGtraining](#) at CRG Barcelona - R and python scripting on Day2.

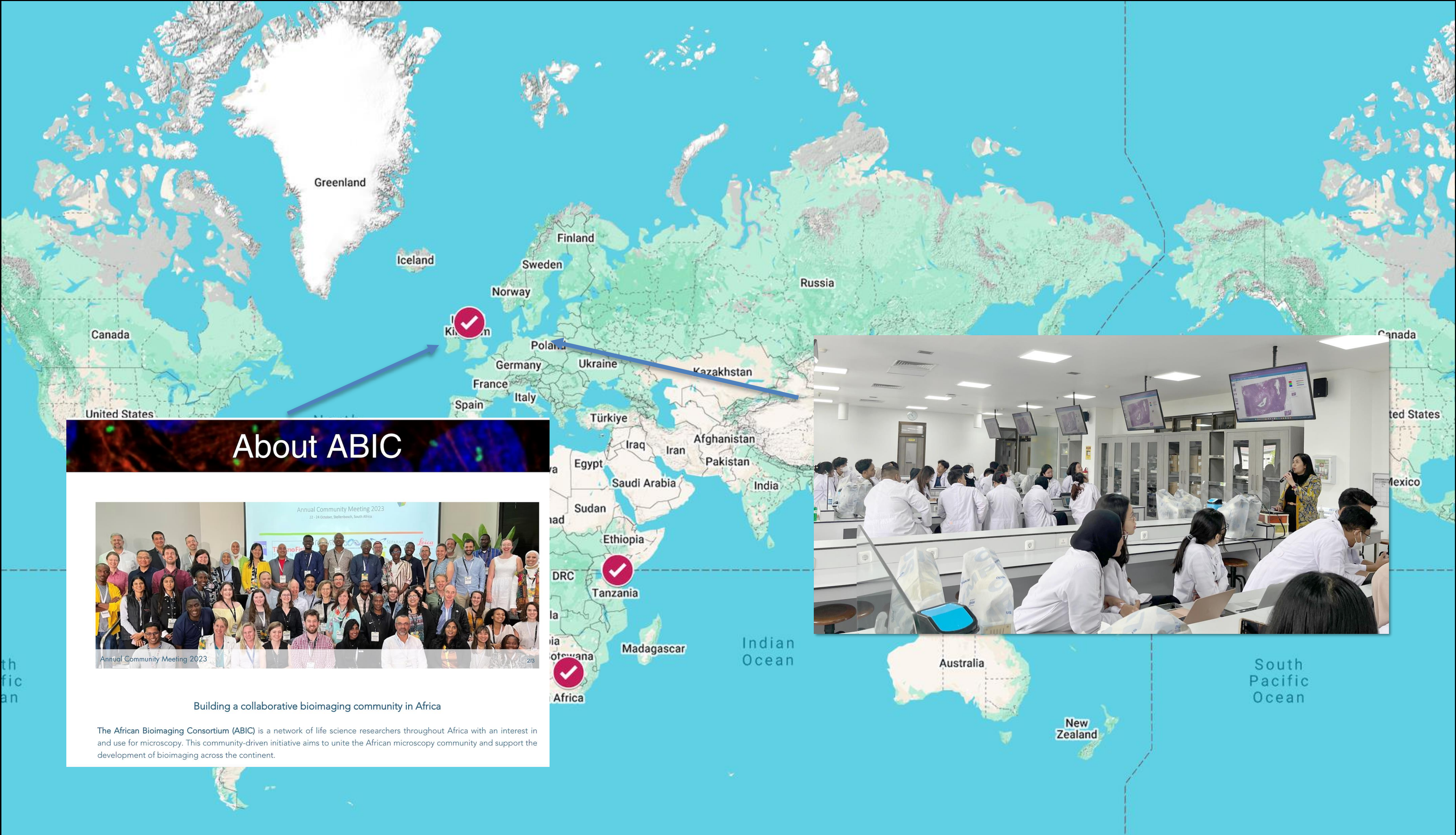


9:23 AM · Nov 13, 2023 · **684** Views

Search: “openmicroscopy events”



# OMERO as a Teaching Platform



**About ABIC**

Annual Community Meeting 2023  
21-24 October, Stellenbosch, South Africa

Building a collaborative bioimaging community in Africa

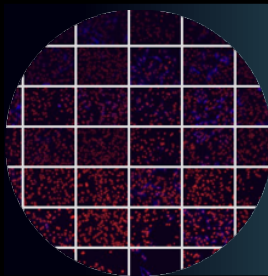
The African Bioimaging Consortium (ABIC) is a network of life science researchers throughout Africa with an interest in and use for microscopy. This community-driven initiative aims to unite the African microscopy community and support the development of bioimaging across the continent.



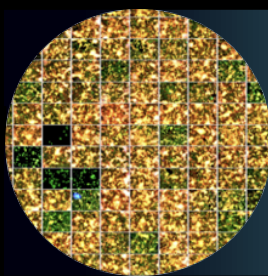
# The IDR @ EBI Embassy

## Integrated studies

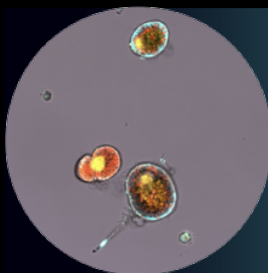
Gene Product  
Targeting HCS



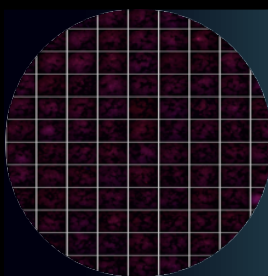
Genetic HCS



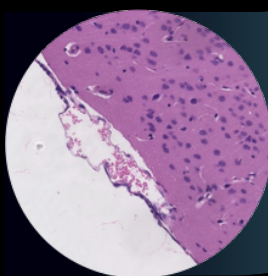
Geographic HCS



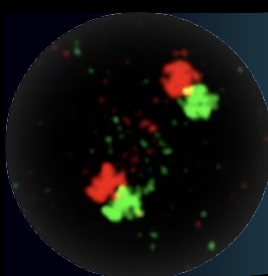
Chemical HCS



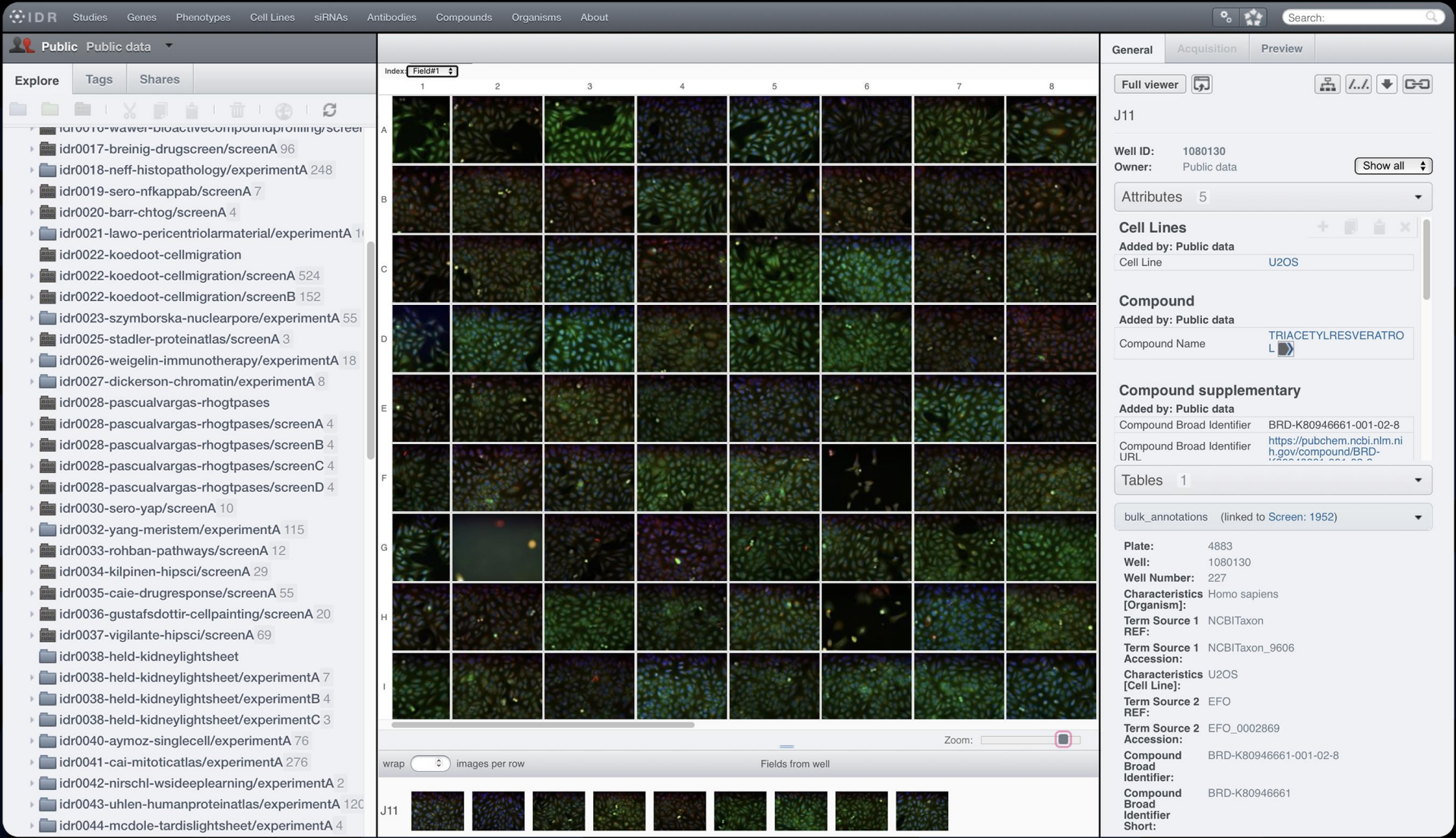
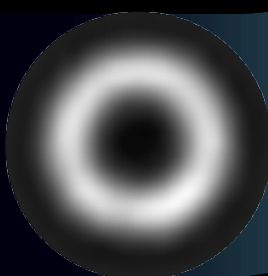
Histopathology



3D-Sim



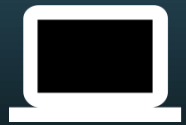
Super-resolution



Experimental  
metadata

Biomolecular  
annotations

Analysis  
results



Cross-data  
browsing



Download  
local analysis

Thumbnails (of 5D Images)



idr.openmicroscopy.org

IDR

CELL - IDR

TISSUE - IDR

ABOUT ▾

The Image Data Resource (IDR) is a public repository of microscopy studies, where the community can submit and share their data.

cell - IDR

Choose search field (optional) ▼ baz1

3022 Images matched Gene Symbol: baz1b

194 Images matched Gene Symbol: baz1a

146 Images matched Human Ortholog Gene Symbol: baz1a

146 Images matched Genotype: baz1a knockout

52 Images matched Individual: baz1a-14-75

34 Images matched Individual: baz1a-14-100

30 Images matched Individual: baz1a-14-99

30 Images matched Individual: baz1a-14-76

12 Images matched Original Gene Target: baz1a

idr.openmicroscopy.org/search/?key=Gene+Symbol&value=baz1a&

IDR

CELL - IDR

TISSUE - IDR

Home

Attribute

Gene Symbol

Search Gene Symbol e

ID	Images
▼ idr0018A	146
Images from study: idr0018	
▶ idr0009A	14 G
▶ idr0093A	9 H

[←](#) [→](#) [G](#) [idr.openmicroscopy.org/search/?key=Gene+Symbol&value=baz1a&operator>equals](#) ☆ [🔍](#) [📄](#) [🗂️](#)

---

CELL - IDR    TISSUE - IDR
ABOUT ▾

[◀ Home](#)

Attribute	Operator	Value
Gene Symbol ▾	equals ▾	baz1a

Search **Gene Symbol** equals **baz1a** found **194** images in **8** experiments/screens

ID	Images	Publication Title
▼ idr0018A	146	Histopathology of mouse knockouts
Images from study: <b>idr0018</b> 		
▶ idr0009A	14	Genome-wide RNAi screening identifies human proteins with a regulatory functio...
▶ idr0093A	9	High content genome-wide siRNA screen to investigate the coordination of cell siz...



# Interoperability: metadata Exploration

←

→

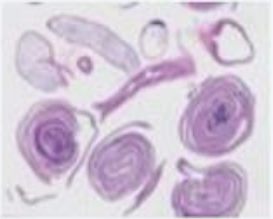
↺

idr.openmicroscopy.org/study/idr0018/

CELL - IDR

TISSUE - IDR

idr0018



Release Date: 2016-05-26

License: CC BY 4.0

Sample Type: tissue

Organism: Mus musculus

Study Type: histology

Imaging Method: bright-field microscopy

Copyright: Frauke Neff and Jean-Karim Heriche

Annotation File: [idr0018-experimentA-annotation.csv](#)

Histopathology

Histopathology raw in different single gene

Browse Data in

idr0018-neff-histopa

BioFile Finder

BioFile Finder is a tool below is loaded from Images can be selected the IDR viewer.

experimentA

(899 ro

Download

To download original

For more download o

see the IDR [Data dov](#)

BioFile Finder

Powered by BigFile Finder

Open-source datasets Learn Help

+ ADD

≡

📄

📊

A

A

Query

+

ta source

+

2018-neff-histopathology/ex...

+

roup by

+

ater

+

rt

+

🗑️

🔄

📄

💾


🔗

index	image_webclient_url	File Path	Thumbnail
0	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
1	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
2	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
3	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
4	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
5	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
6	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
7	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
8	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
9	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
10	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
11	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
12	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
13	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
14	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
15	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
16	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
17	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
18	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
19	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
20	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
21	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
22	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
23	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...
24	https://idr.openmicr...	https://idr.openmicr...	https://idr.openmicr...

Total Files Selected

Unique Files Selected

899 files



Metadata

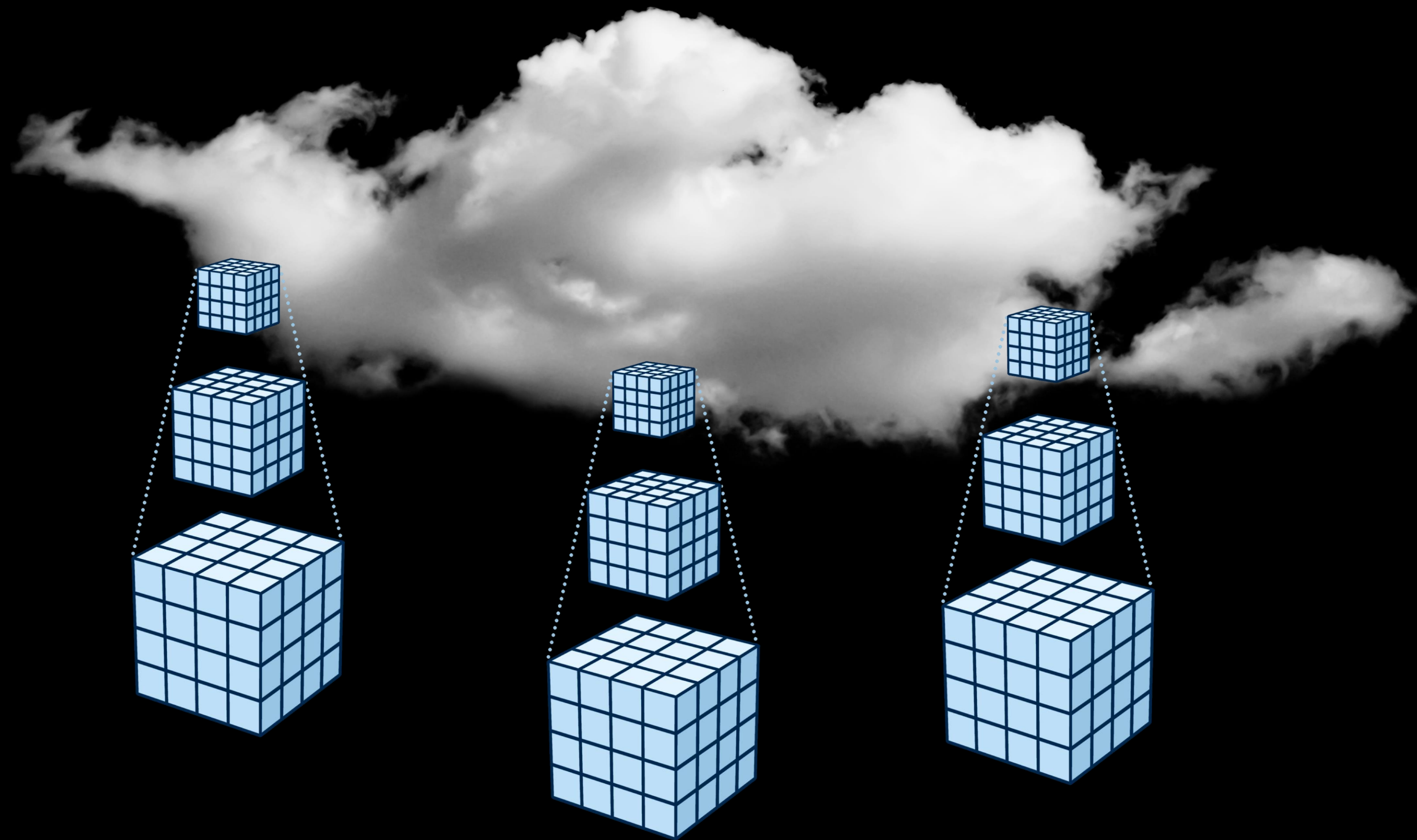
Channels	RGB
data_source	idr
File Path	https://idr.openmicroscopy.org/webclient/img_detail/1919109/
Gene Annotation Comments	Gene Identifiers and Symbols: Mouse, GRCm38.p4, Ensembl mouse release 84, Mar 2016 Human, GRCh38.p5, Ensembl Human release 84, Mar 2016. Added by IDR curators.
Gene Identifier	ENSMUSG00000071553
Gene Identifier URL	http://www.ensembl.org/id/ENSMUSG00000071553
Gene Symbol	Cpa2
Genotype	Cpa2 knockout
Has Phenotype	yes

Idr.openmicroscopy.org & bff.allencell.org



2018

# A changing landscape



Zarr



OME-Zarr

# Chunked Data for Global Remote Access

Dataset  
1TB

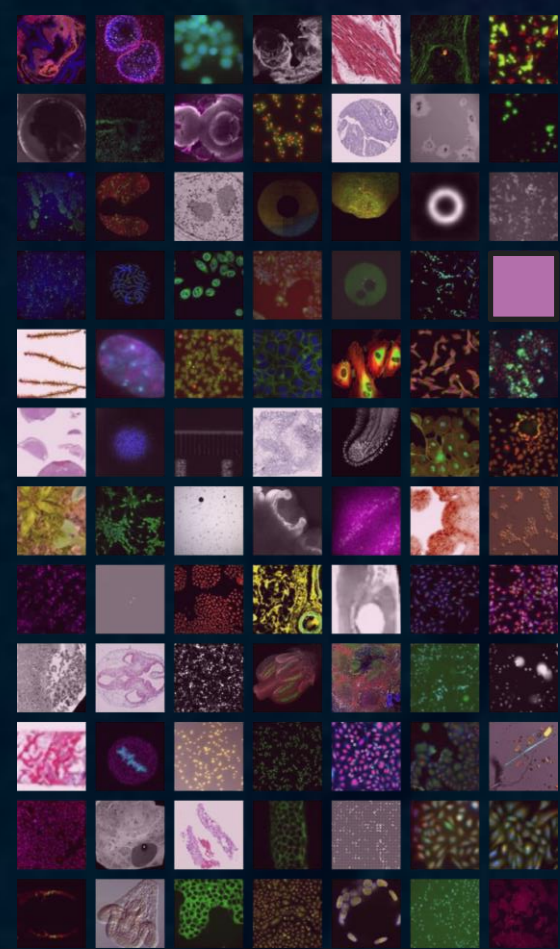
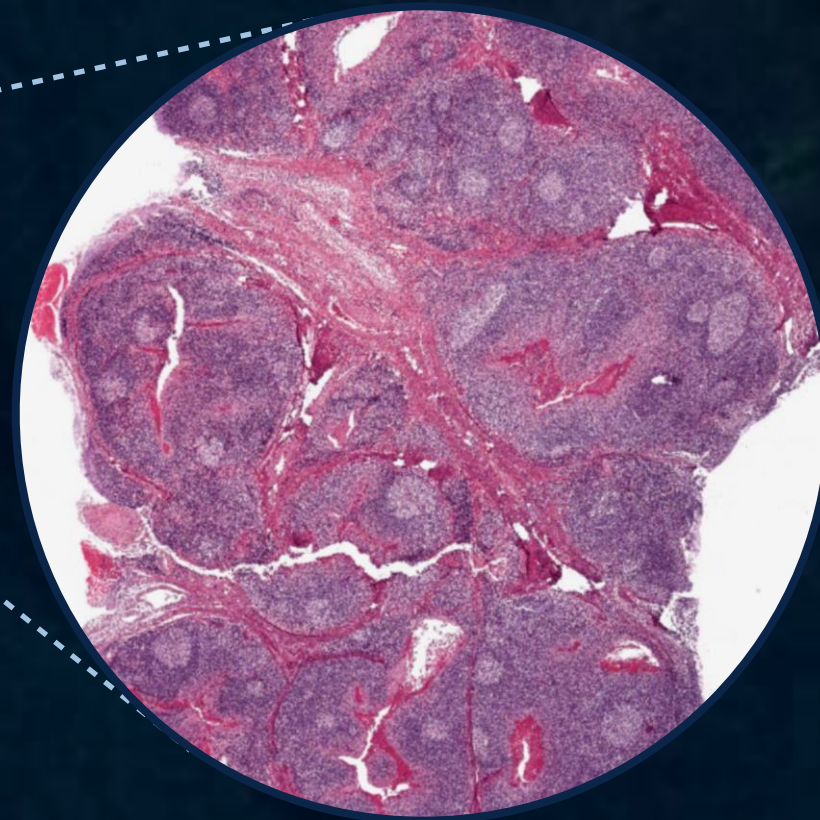


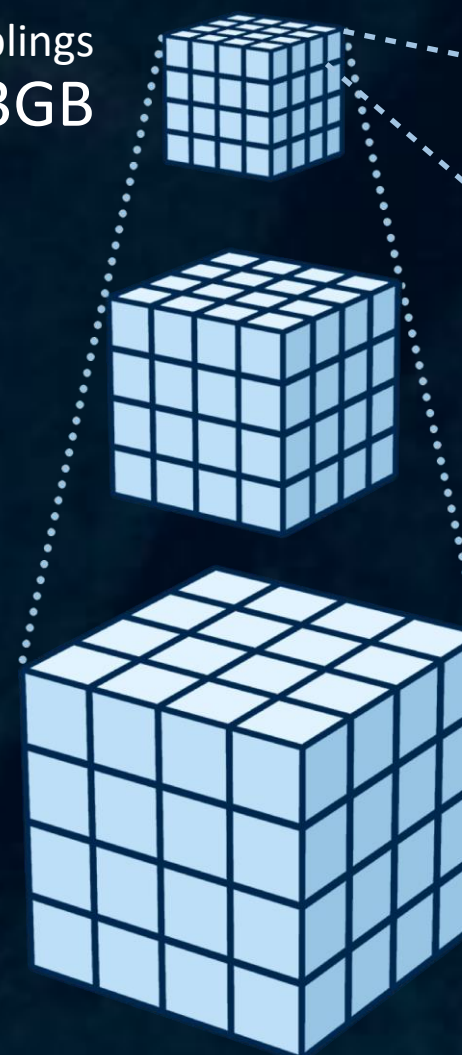
Image  
10GB



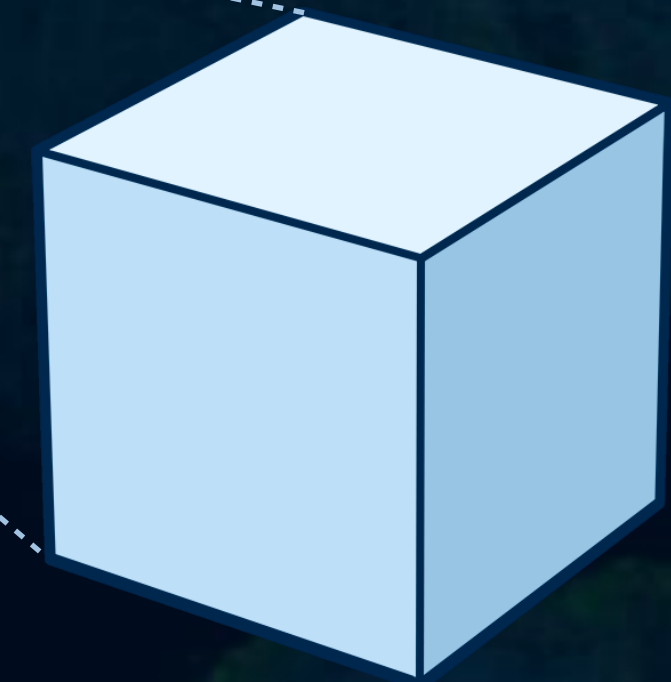
Resolution Levels  
0.3GB

Downsamplings  
0.3GB

Full  
resolution  
10GB



Chunk  
1MB




+ Metadata: data about the data



How did the existing ecosystem adjust?




# IDR searcher


 2024 NGFF Challenge


About


422.89 TB of public bioimage data in the next major version of OME-Zarr, including Zarr v3 and sharding, with distributed hosting.


Filter by Name or Description


 IDR (23.84 TB)


 BioImage Archive (40.40 GB)

 JAX (81.48 TB)

 Webknossos (315.47 TB)

 Crick (10.05 GB)

 NFDI4BIOIMAGE (2.00 TB)

 SSBD (59.78 GB)

Filter by:

Dimension Count


Cleavea hyalina

Imaging Modality

Sort by:

--

Showing 64 out of 15305 images



IMG\_2151-2250 Atha

idr0157 Peters Bryophy

Data from collection [idr0157](#)





Image size: T:1 C:3 Z:

Data size: 15.31 GB



IMG\_0684-0763 Atha

idr0157 Peters Bryophy

Data from collection [idr0157](#)





Image size: T:1 C:3 Z:

Data size: 24.49 GB



IMG\_2251-2350 Atha

idr0157 Peters Bryophy

Data from collection [idr0157](#)





Image size: T:1 C:3 Z:

Data size: 15.53 GB



IMG\_1351-1450 Athalamia hyalina var. suecica thallus with air pore cross section (40x DIC).ome.zarr

clients

API access

Queries

Results

IDR searcher

Elasticsearch cluster

Data indexing

Data source

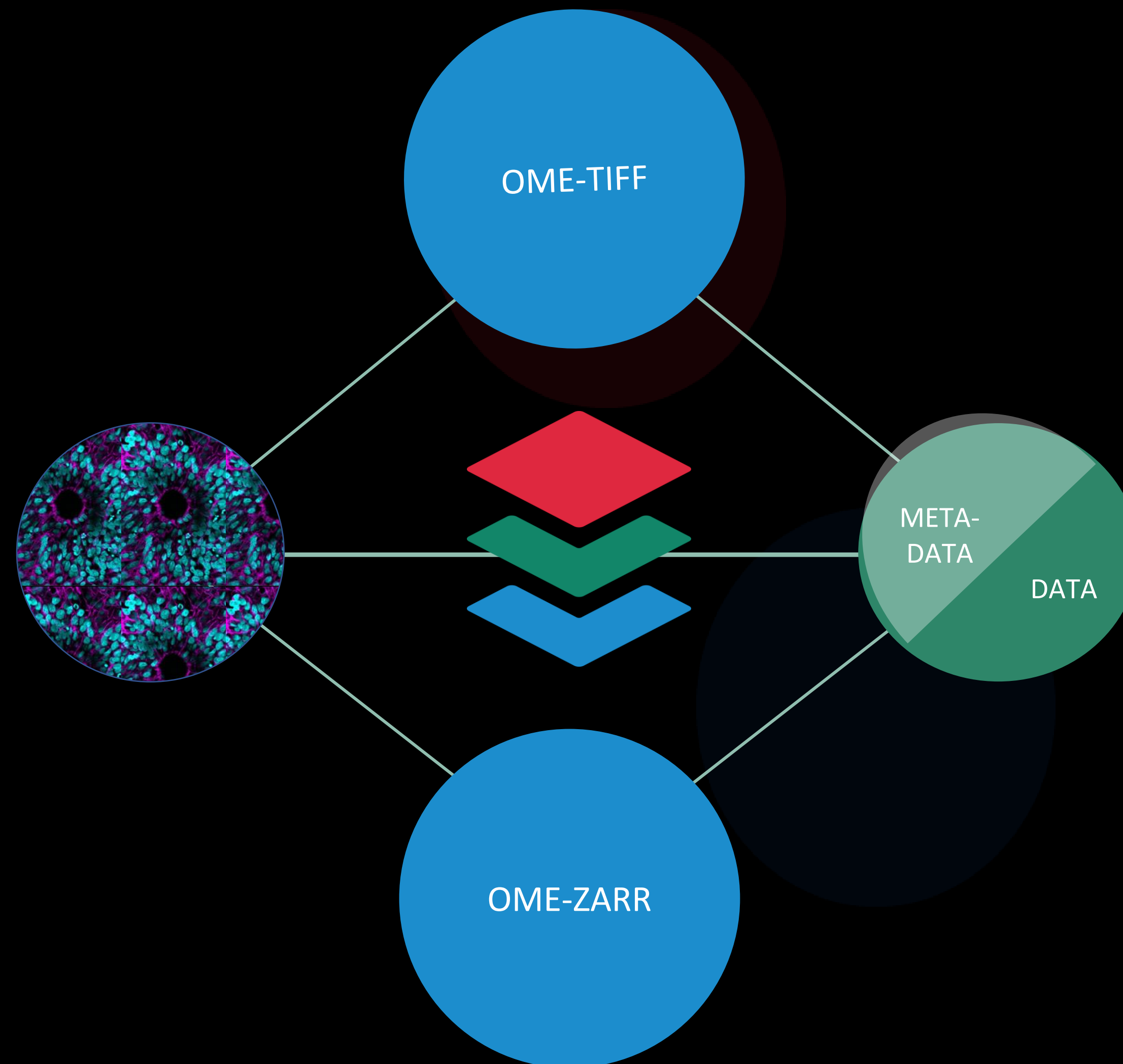


What about OMERO & Bio-Formats?



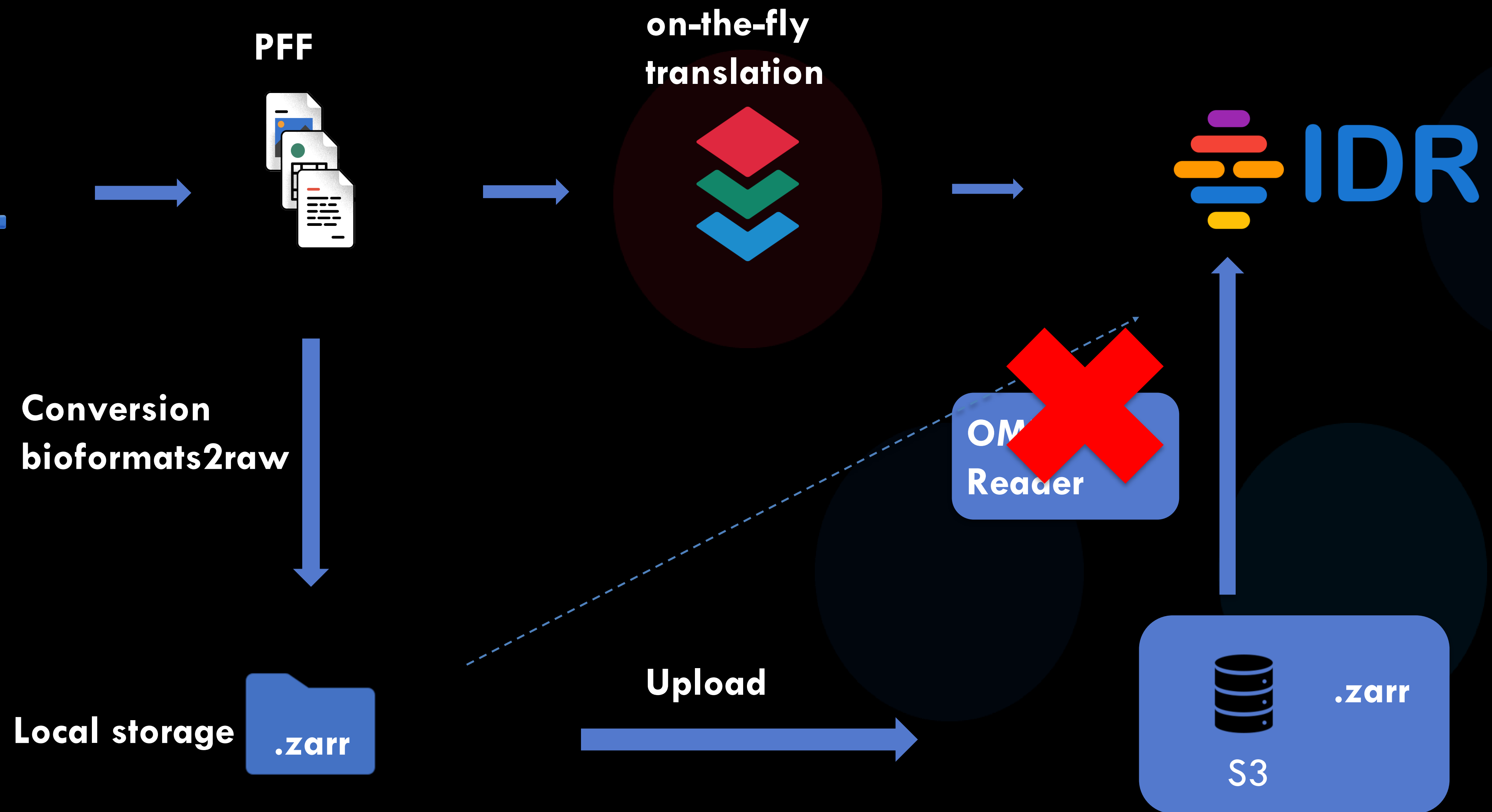


# Open Standard Formats



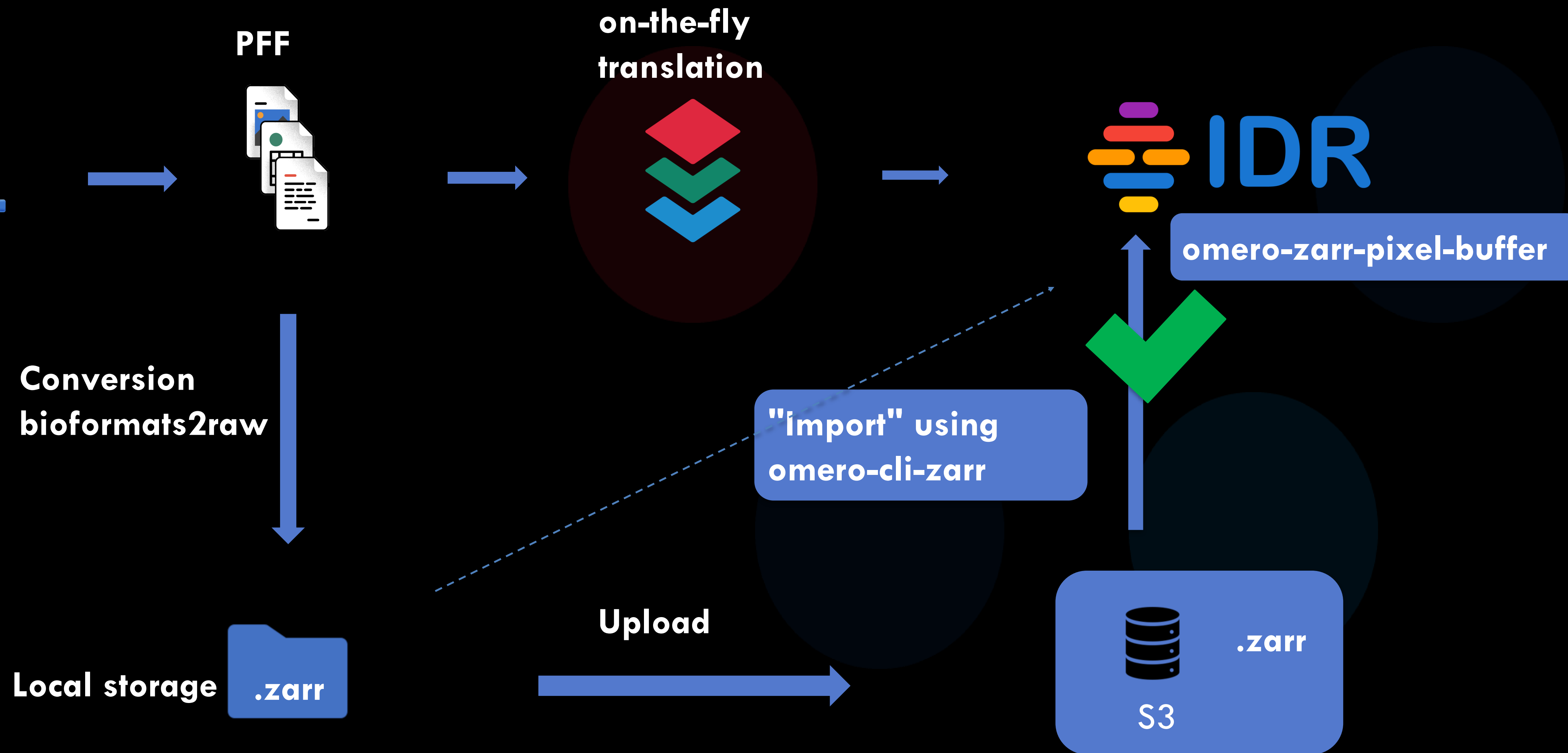


# OME-Zarr workflow for IDR



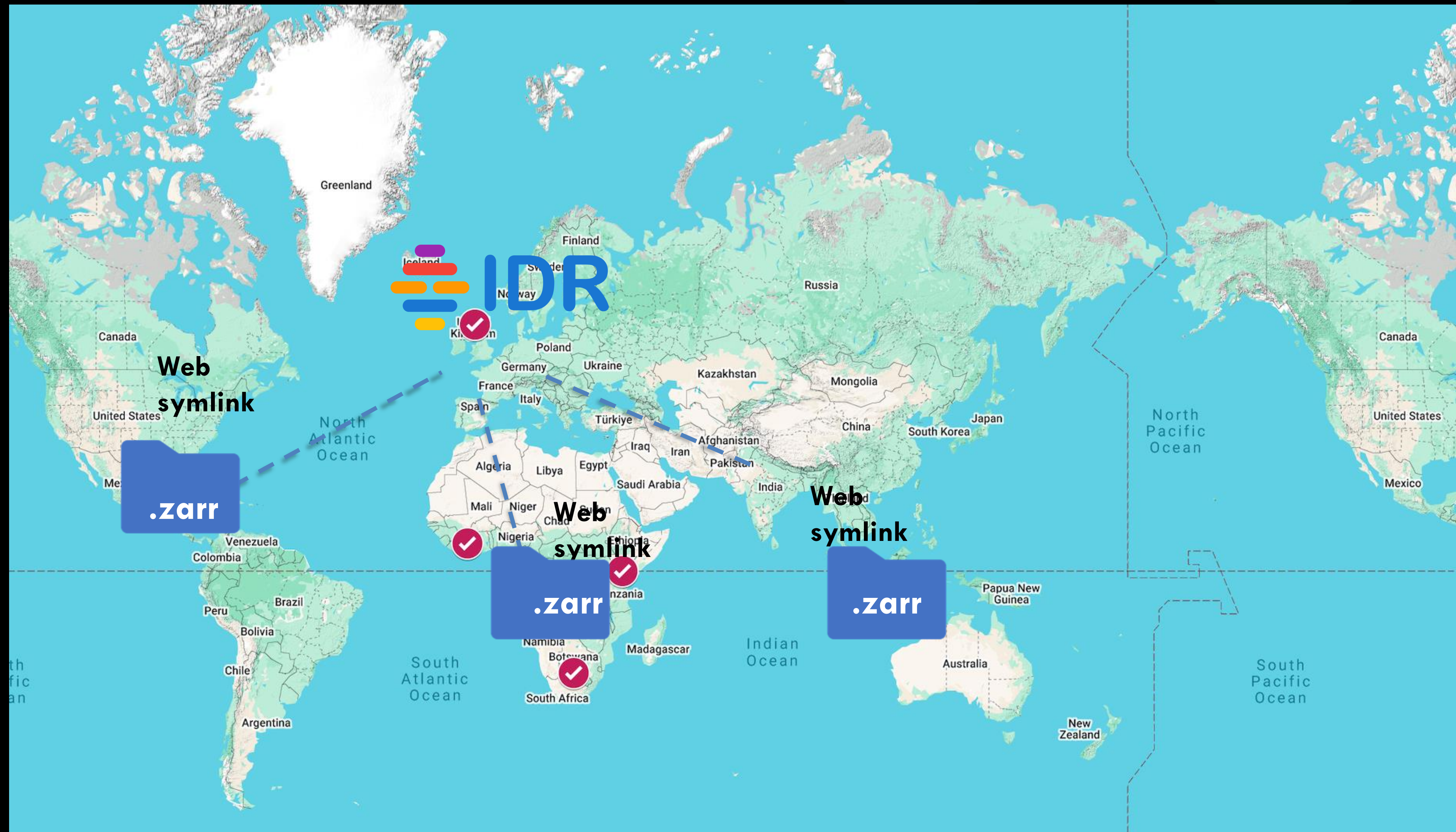


# OME-Zarr workflow for IDR





# Collection of "Web symbolic" links

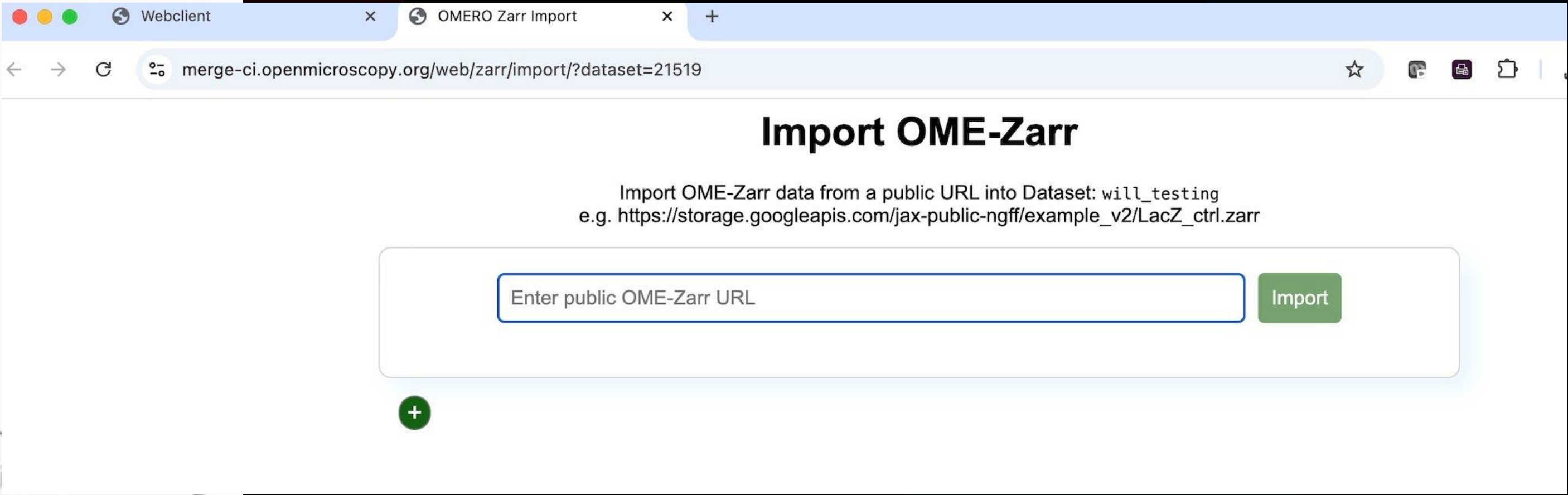
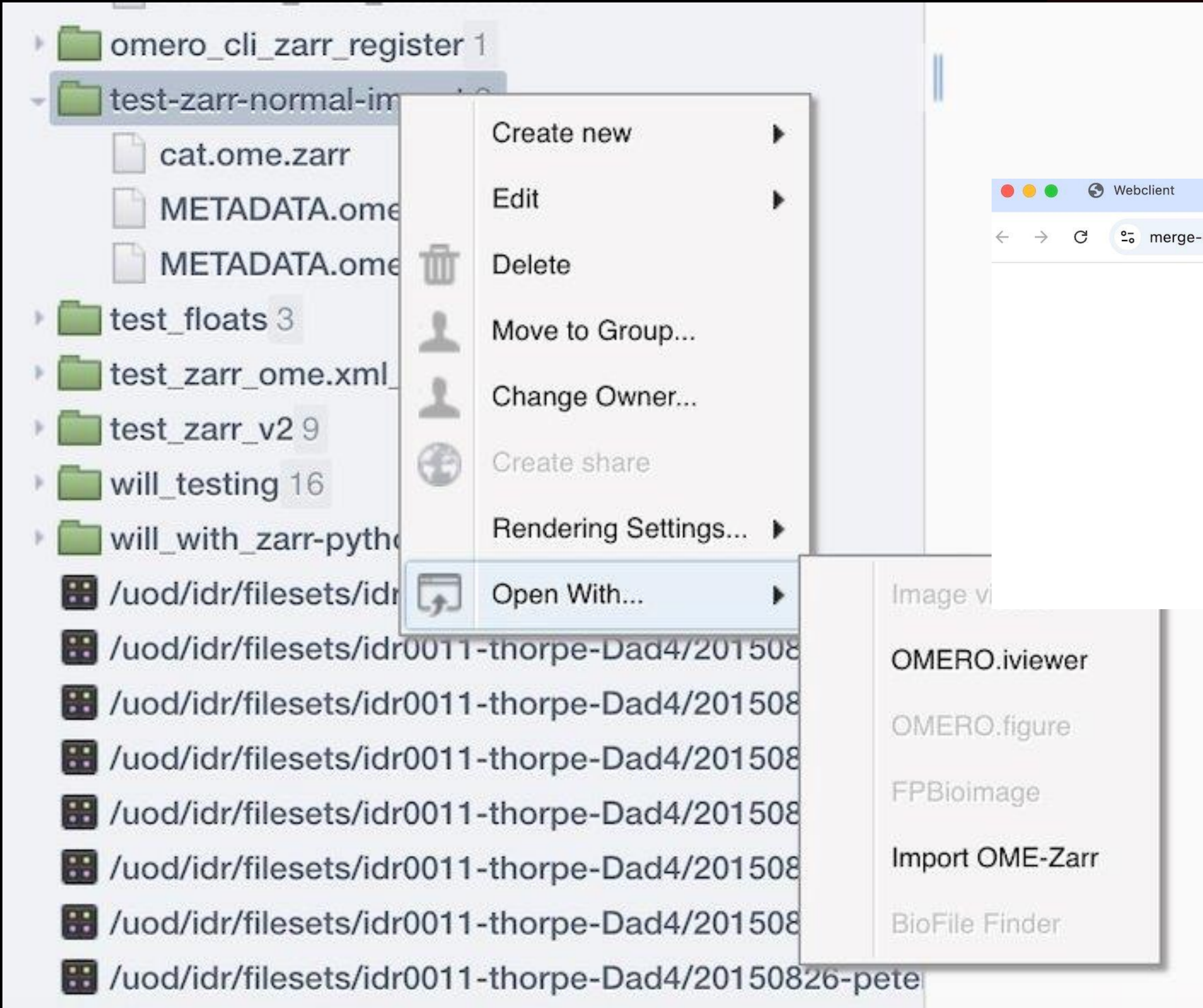




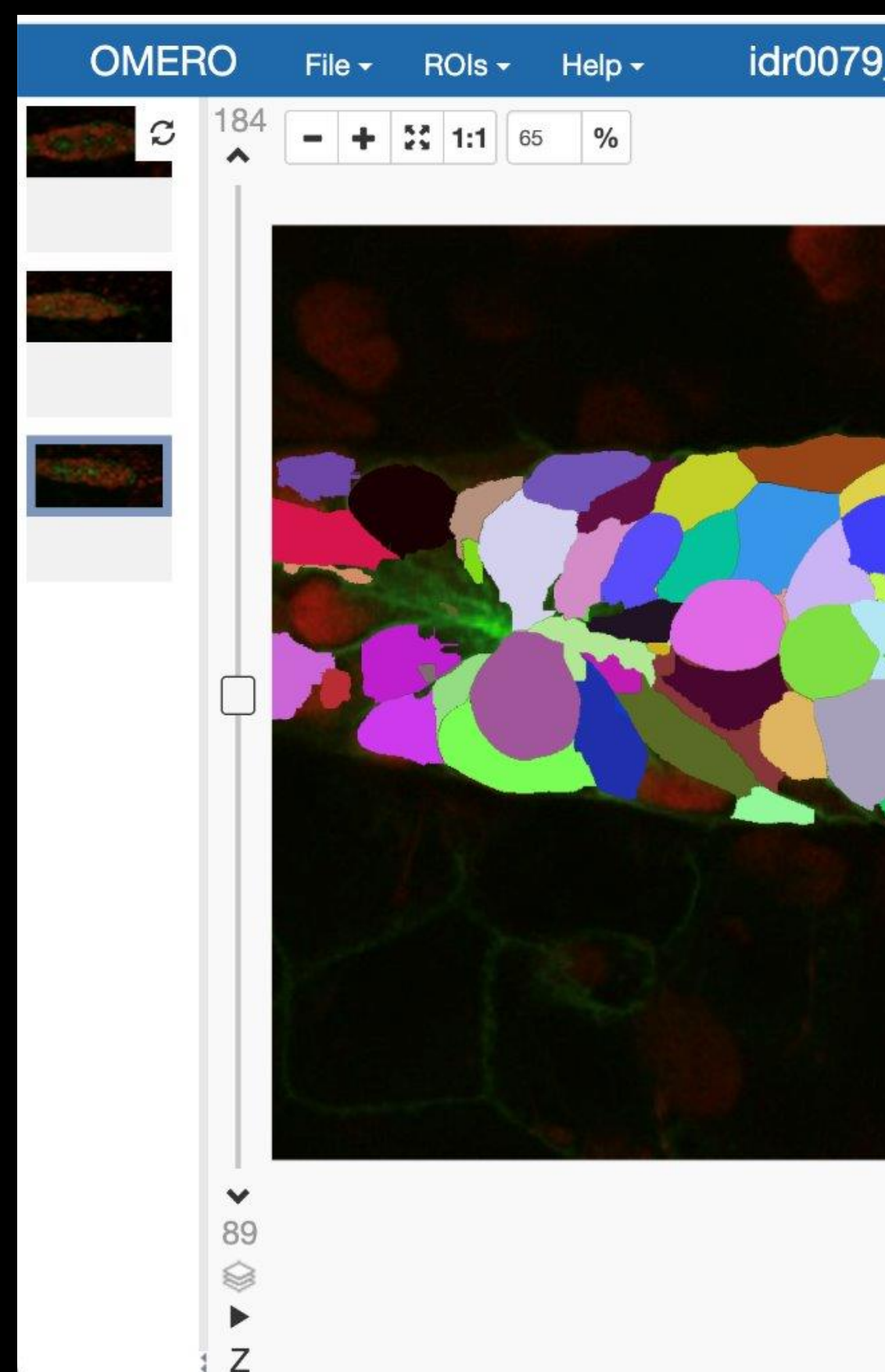
# CLI

```
omero zarr import https://livingobjects.ebi.ac.uk/idr/zarr/v0.4/idr0079A/idr0079_images.zarr
```

# Web





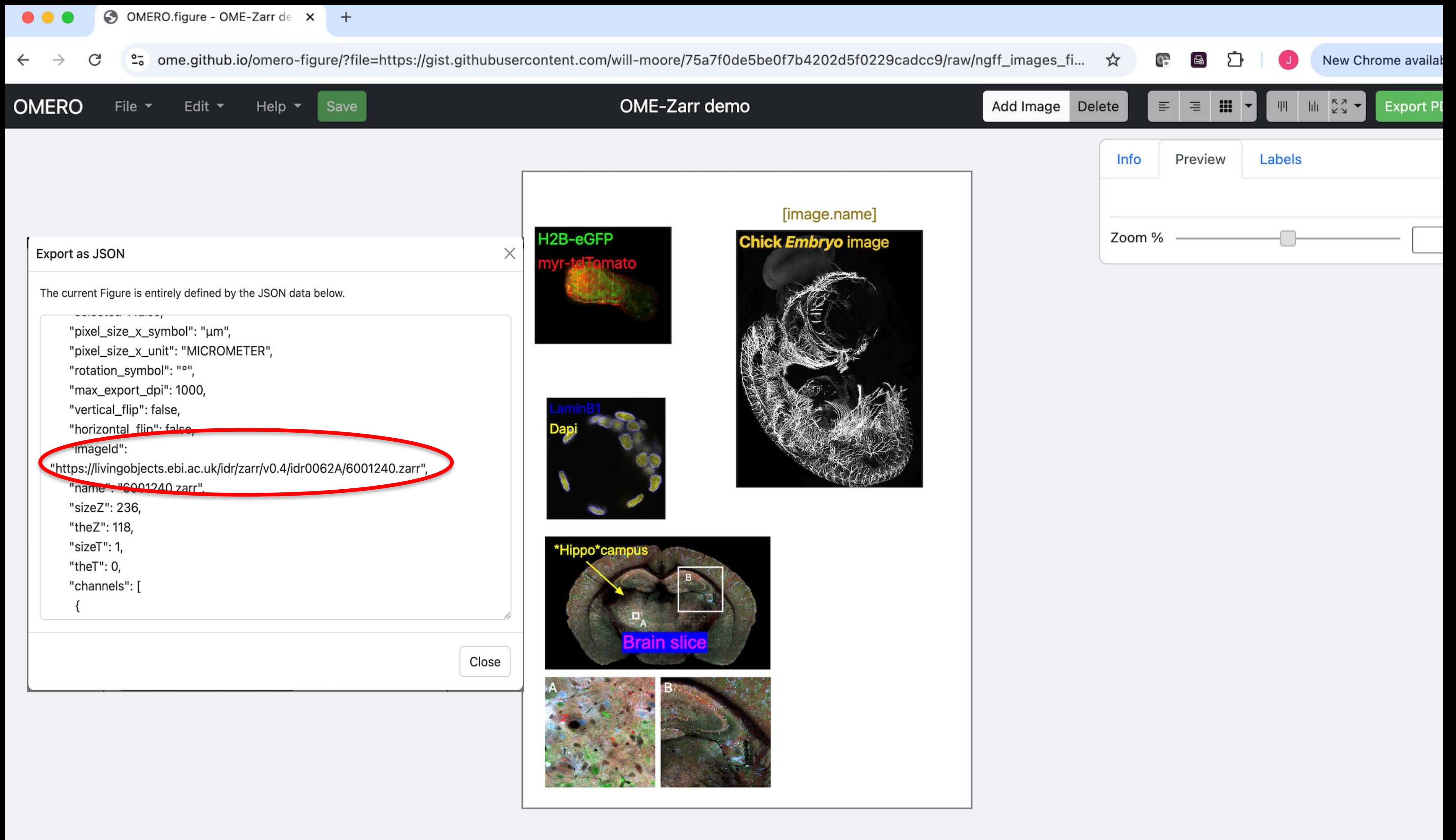


<https://github.com>



<https://github.com/BioNGFF/vizarr>





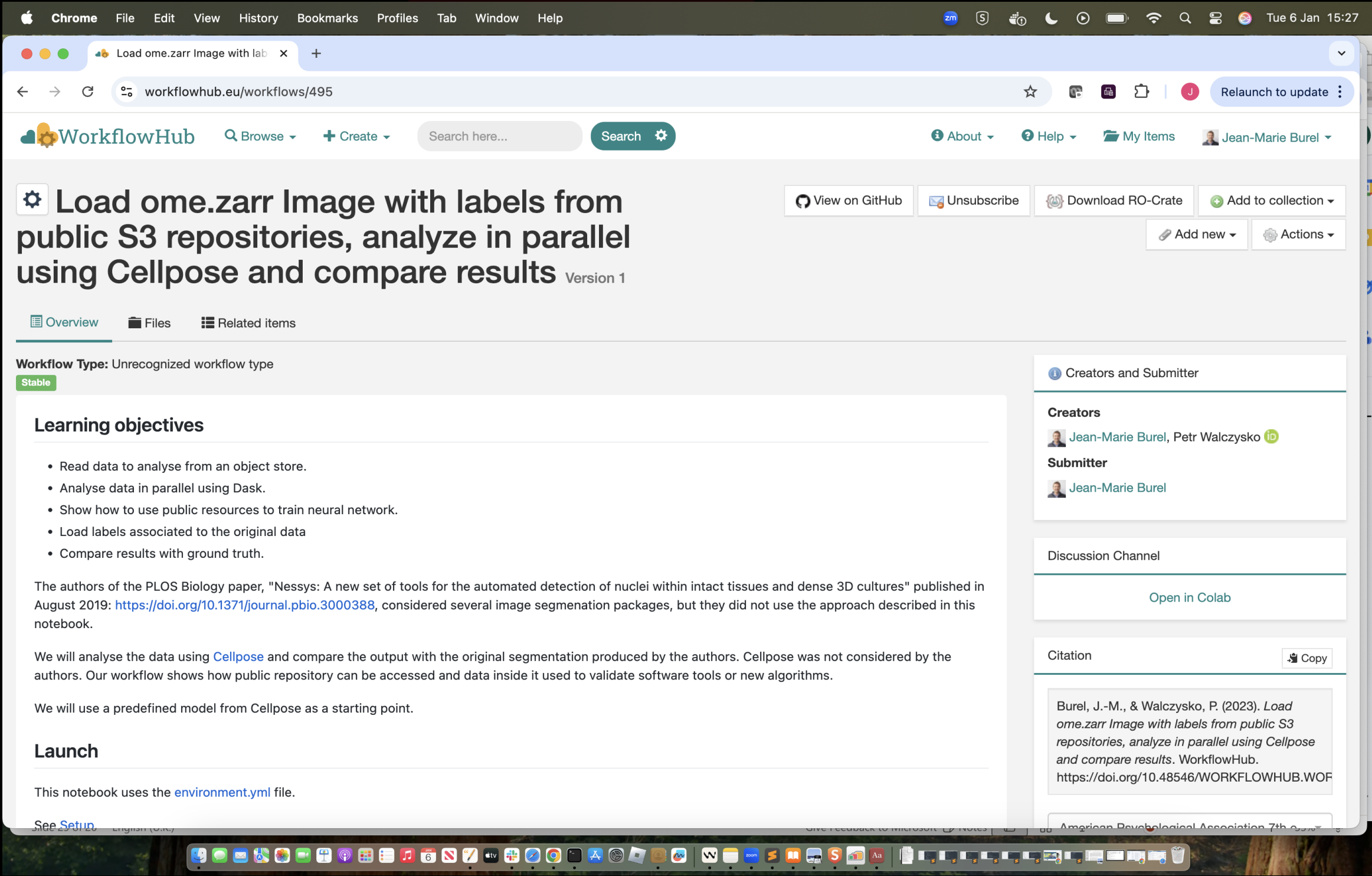
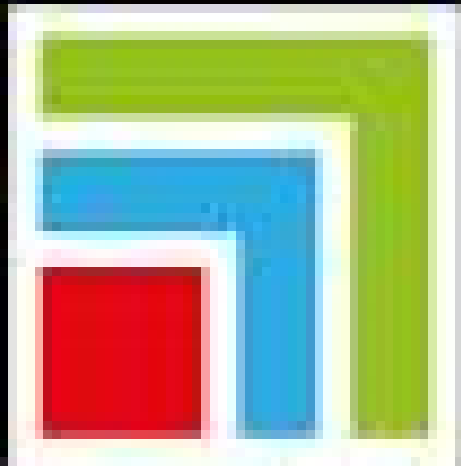


# Connecting resources



SSBD

.zarr



<https://workflowhub.eu/workflows/495>



Galaxy



# Thanks to the OME Community

<https://www.openmicroscopy.org/teams>

