The Image Data Resource (IDR): a scalable resource for FAIR biological imaging data

OME Team

University of Dundee

@openmicroscopy, @IDRNews
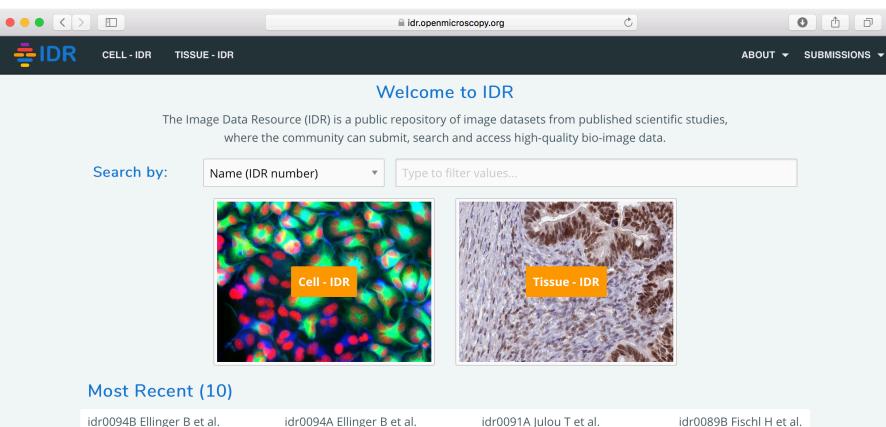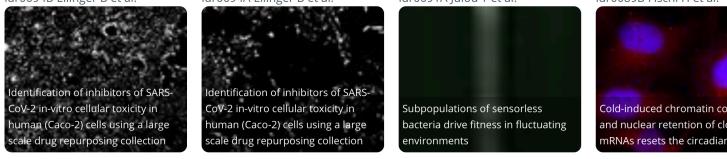
University of **BRISTOL**

University of Dundee

EMBL-EBI

IDR Homepage
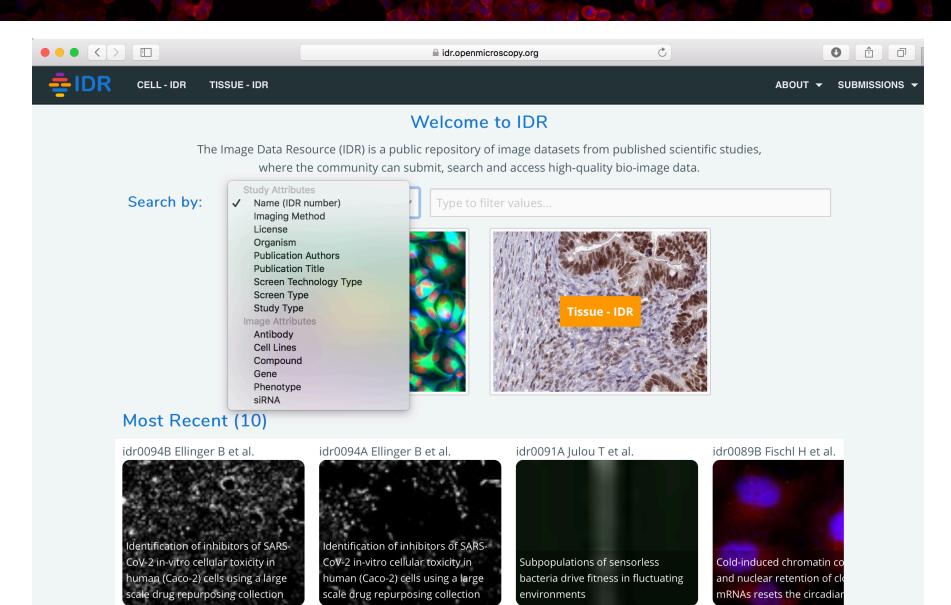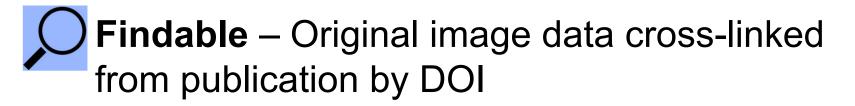

https://idr.openmicroscopy.org

IDR Homepage

https://idr.openmicroscopy.org

Findable – Original image data cross-linked from publication by DOI
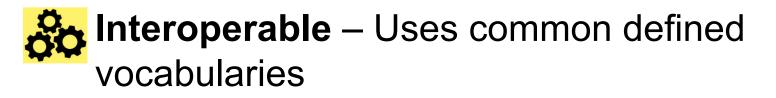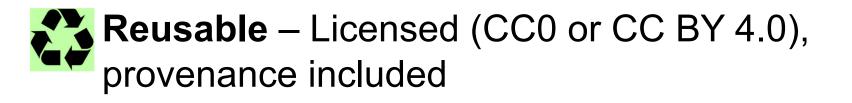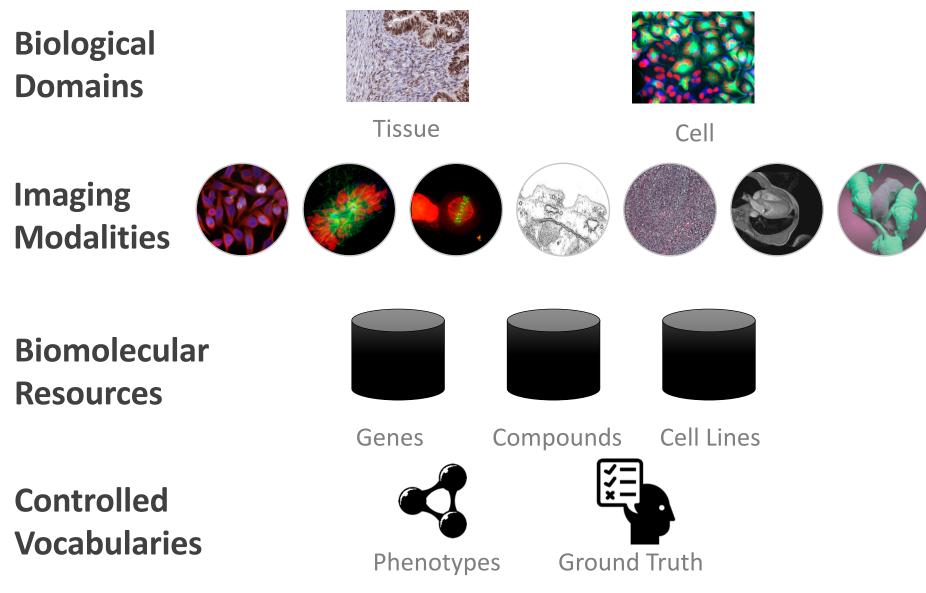
Accessible – Metadata retrievable, open API

Interoperable – Uses common defined vocabularies

Reusable – Licensed (CC0 or CC BY 4.0), provenance included

Reference datasets

Biological Domains

Tissue

Cell

Imaging Modalities

Biomolecular Resources

Genes

Compounds

Cell Lines

Controlled Vocabularies

Phenotypes

Ground Truth

https://idr.openmicroscopy.org/about/submission.html
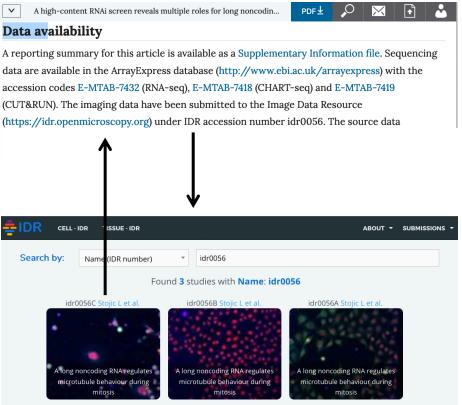
October 2020	
Raw data size	190 TB
Image files	24 M
5D Images	10 M
2D Planes	71 M
Organisms	13
Genes	83 K
Antibodies	8 K
Compounds	38 K

>85 cross-published studies

cross-referenced via accessions and DOIs

https://idr.openmicroscopy.org/about/studies.html

The IDR @ EMBL-EBI Embassy
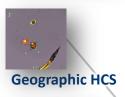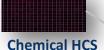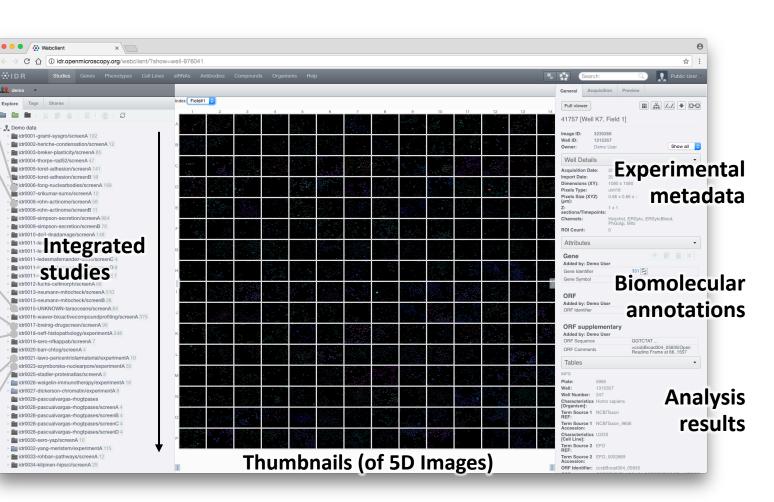
Gene Product Targeting HCS

Genetic HCS

Geographic HCS

Chemical HCS

Histopathology

3D-Sim

Super-resolution

Integrated studies

Experimental metadata

Biomolecular annotations

Analysis results

Thumbnails (of 5D Images)
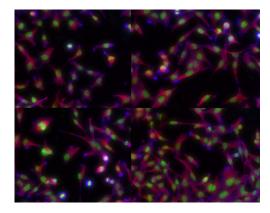
Cross-data browsing
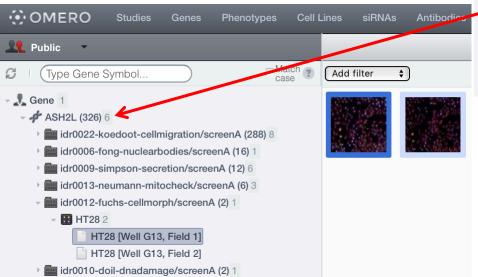
Cloud analysis

Download (local analysis)

Linked Metadata

Linked Metadata
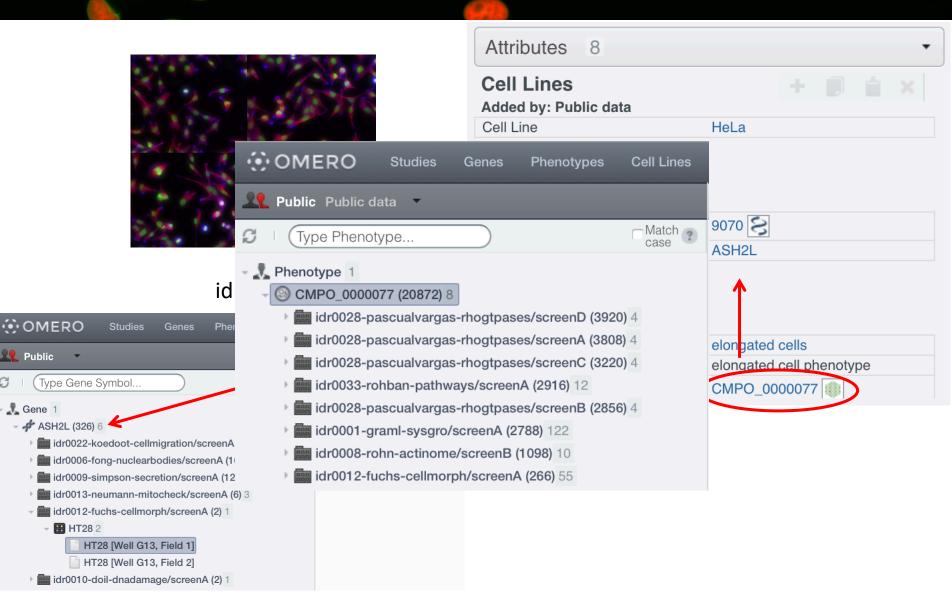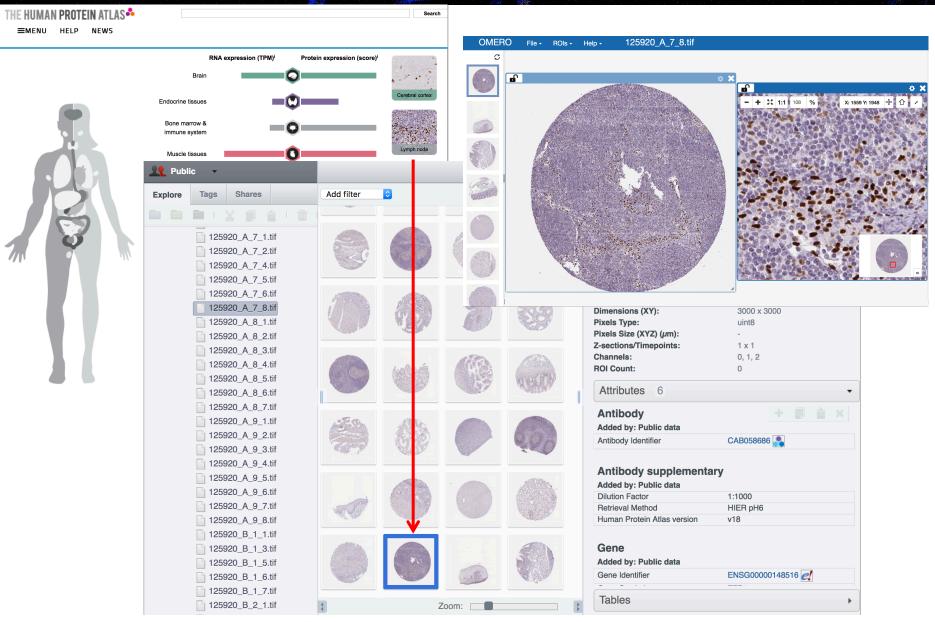
Ontologies

Organism	NCBITaxon https://www.ncbi.nlm.nih.gov/taxonomy
Study Type	Experimental Factor Ontology (EFO) https://www.ebi.ac.uk/efo/
Screen Type (HCS)	Experimental Factor Ontology (EFO) https://www.ebi.ac.uk/efo/
Screen Technology Type (HCS)	Experimental Factor Ontology (EFO) https://www.ebi.ac.uk/efo/
Library Type (HCS)	Experimental Factor Ontology (EFO) https://www.ebi.ac.uk/efo/
Protocol	Experimental Factor Ontology (EFO) https://www.ebi.ac.uk/efo/
Imaging Method	Biological Imaging Methods Ontology (FBbi) https://www.ebi.ac.uk/ols/ontologies/fbbi
Phenotype	Cellular Microscopy Phenotype Ontology (CMPO) https://www.ebi.ac.uk/cmpo/
Clinical/Pathology	SNOMED CT https://bioportal.bioontology.org/ontologies/SNOMEDCT
Compounds	PubChem https://pubchem.ncbi.nlm.nih.gov/

Tissue Data: Human Protein Atlas

IDR and EMPIAR

Open cloud and open analytics

https://github.com/IDR/idr-notebooks

IDR

https://github.com/IDR/idr-notebooks can be launched in MyBinder, just click the badge

https://github.com/ome/omero-guide-fiji
https://github.com/ome/omero-guide-cellprofiler
https://github.com/ome/omero-guide-python
…
contain IDR-specific notebooks too !
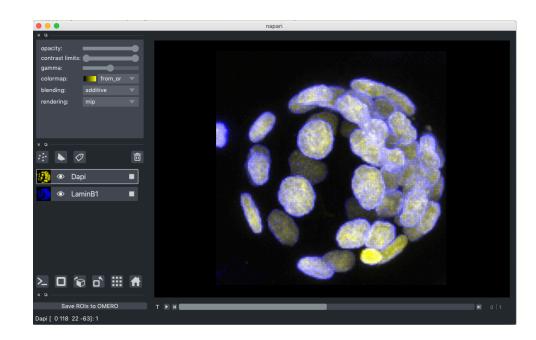
Redesigning data access for re-analysis

IDR

From file download   *... to scalable remote data access*

Aspera   **Zarr + napari**

As seen in sharing big image data in the

cloud workshop tomorrow

https://idr.openmicroscopy.org/about/download.html

IDR

Publicly available, curated studies…

submitted by the community…

in a searchable, scalable platform...

that links metadata …

and enables reanalysis …

that can be deployed by others.

Thanks to the funders

Thanks to the IDR Team

IDR

OME

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Josh Moore	**Jean-Marie Burel**	**Petr Walczysko**	**Will Moore**	**David Gault**

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