

Training on OMERO

OME 2024

OME Team

HORIZON 2020



Biotechnology and
Biological Sciences
Research Council



University
of Dundee



EMBL-EBI



EURO  BIOIMAGING

GLOBAL
BIOIMAGING
growing collaboration

Presentations available @

**[https://downloads.openmicroscopy.org/
presentations/2024/Dundee](https://downloads.openmicroscopy.org/presentations/2024/Dundee)**

OME Team trainings



July 2023: GBI ABiS course, Okazaki & Kobe

- **Organizers: Shuichi Onami, Naoto Ueno, Gleb Grebnev**
- **Participants from Cameroon, India, Sri Lanka, Mexico**
- **Asia & South America – data management interest**

▶  Community Partners

Configuration of the OMERO server

■ Data Management omero

 It's been a while since we've seen SANTOSH PODDER — their last post was 3 years ago.



SANTOSH PODDER santosh.p

Nov 2023

We are in the process of installing a 200TB storage server for the microscopy facility. We would like to host an OMERO server for better data management. What will the workstation configuration (OMERO.server) which can be worth for the next 5 years?



image.sc

Participant:

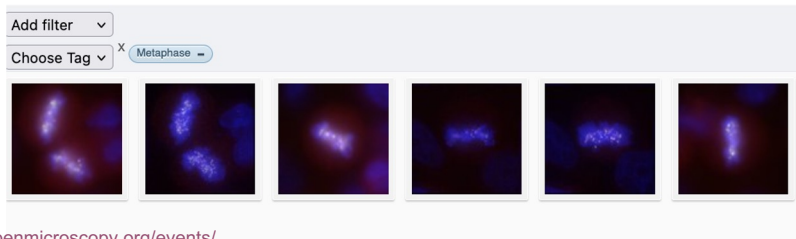
Adan Guerrero

National Laboratory for Advanced Microscopy (Mexico)

Using IDR and Zarr data for imaging projects
<https://chan Zuckerberg.com/imaging/connecting-the-mexican-bioimaging-community/>

Training workflows - basic

- **Basic: Data management, visualization&analysis by scientists using imaging**
- **Public data only, main source: IDR**



<https://www.openmicroscopy.org/events/>
<https://www.openmicroscopy.org/training/>

Training workflows - advanced

- Python, R APIs
- Jupyter Notebooks and IDR data
- OME-NGFF
- coding



OMERO at your institution

Canada Bioluminescence, Montreal

University of Arizona

July/August 2023



OMERO Hands-On Workshop - July 31 - August 1, 2023

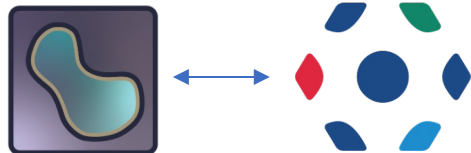


<https://www.canadabioimaging.org/>

- Organizers: Claire Brown, Douglas Cromey
- Supporting national OMERO Image Data Resource (Canada) and groups at McGill University, Montreal
- Joint North American tour with University of Arizona

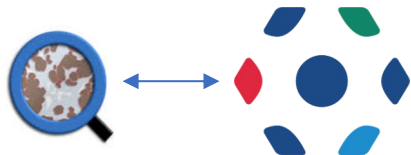
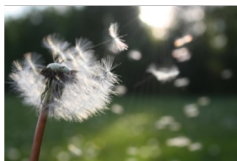
November 2023: CRG Barcelona

- Organizers: Nadia Halidi
- Open workshop for participants from all over the world



June 2024: Smithsonian Institute, Panama

- Organizer: Carlos Jaramillo
- Large images
- Palynological slides (plant pollens, spores, microorganisms), both living and fossil
- Emphasis on QuPath



<https://stri.si.edu/>

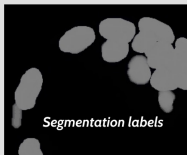
April 2024: EMBL-EBI imaging course

Image analysis and public repositories course

Organizers: Team from EMBL-EBI (Craig Russel, Matthew Hartley, Patricia Carvajal) and external tutors

EMBL-EBI course

*Images stored in IDR
with labels as OMERO ROIs*



*Python-based analysis
environment*

Notebook with StarDist

Load Image with labels from IDR, analyze using StarDist and compare results

The notebook shows how to load an IDR image with labels.

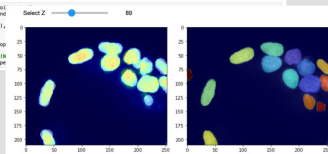
The image is referenced in the paper "NesDis: a novel method for accurate nuclear segmentation in 3D" published August 2019 in PLOS Biology: <https://doi.org/10.1371/journal.pbio.3003398> and can be viewed online in the [Image Data Resource](#).

In this notebook, the image is loaded together with the labels and analyzed using StarDist. The StarDist analysis produces a segmentation, which is then viewed side-by-side with the original segmentations produced by the authors of the paper obtained via the loaded labels.

Labels have been saved as masks.

```
In [9]: from omero_jarr import masks
```

```
In [10]: roi_service = conn.getROI
         result = roi_service.find
         dists = (image.getSize(),
                 shapes = [])
         for roi in result.rois:
             shapes.append(roi.cop
         saver = masks.MaskSaver(IN
         labels, fillColor, prop
```



*Segmentation
labels from
original*

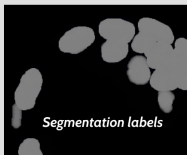
*Segmented by
StarDist in the
Notebook*

*Notebook
segments images
using StarDist and
produces new
segmentation
labels*

*Notebook
compares the
labels*

EMBL-EBI course

*Images stored in IDR
with labels as OMERO ROIs*



*Python-based analysis
environment*

Notebook with Cellpose

Load Cellpose trained model

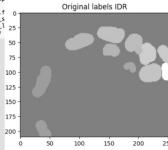
We use an existing trained model from Cellpose. The cytoplasm model in cellpose is trained on two-channel images, where the first channel is the channel to segment, and the second channel is an optional nuclear channel. Please check Cellpose documentation and examples to load your own model.

```
In [8]: from cellpose import models
model = models.Cellpose(gpu=False, model_type='cyto')

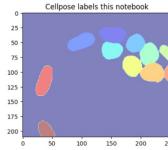
In [9]: channels = [[8, 1]]
t = 0
x = int(image.getPrimaryPlane().getSizeZ() / 2)
cellpose_masks, flows, styles, diams = model.eval(data=[, , x, , ], diameter=None, channels=channels)

In [10]: from cellpose import plot
import matplotlib.pyplot as plt

fig = plt.f
plt.show_s
plt.tight_l
plt.show()
```



*Segmentation
labels from
original*



*Segmented by
Cellpose in the
Notebook*

*Notebook
segments images
using Cellpose
and produces new
segmentation
labels*

*Notebook
compares the
labels*

OMERO as part of teaching platform

Student course assessment

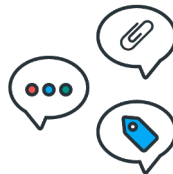
Acquire images



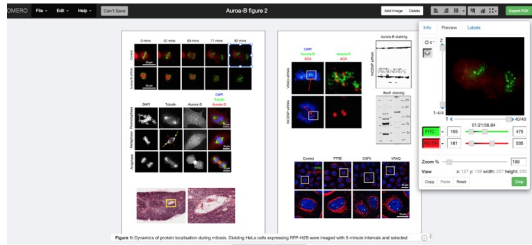
Import to OMERO



Annotate



Create OMERO.figure



February 2024: Student course assessment Karolinska Institutet, Stockholm

- **Organizer: Sylvie Le Guyader**
LCI microscopy course

From sample preparation to image analysis 2024/01/29-2024/02/16

<https://ki.se/en/bionut/lci-microscopy-course>

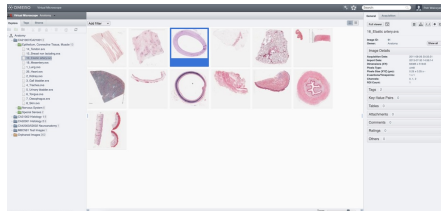
February 2024 OMERO and OMERO.figure workshop

The OME Team gave a public workshop on OMERO and OMERO.figure as part of a three-week course organized by LCI at Karolinska Institutet.

<https://www.openmicroscopy.org/events/workshops-lci-karolinska-february-2024.html>

Images in OMERO as a Teaching tool

“Portal” – ease of access



OMERO.iviewer



Highlight features: ROIs



Images in OMERO as a Teaching tool

- Harvard Medical School (Glencoe Software)
- University of Dundee (Dentistry, Pathology, Anatomy...)
- **See talk about usage @ Universitas Gadjah-Mada Indonesia later today**

OME Team tooling

- OMERO.guides – including community workflow contributions



External Software and OMERO / Fiji / Segment using ImageJ Macro language

[Edit on GitHub](#)

Segment using ImageJ Macro language

Description

The following workflows should work in Fiji, after it has been correctly set up with the OMERO plugin for Fiji/ImageJ.

In this section we use the ImageJ macro language to access data in OMERO. To interact with OMERO using the **ImageJ macro language**, two extra plugins need to be installed.

OME Team tooling

- YouTube Channel



Open Microscopy Environment

@OpenMicroscopyEnvironment · 424 subscribers · 68 videos

OME develops open-source software and data format standards for the storage and manag

Subscribe

Home Videos Playlists Community



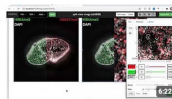
OMERO iviewer

176 views · 3 years ago



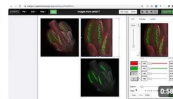
I2K 2020 OMERO workshop

279 views · 3 years ago



OMERO.figure split image as seen on twitter

64 views · 3 years ago



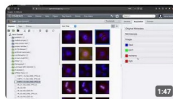
OMERO figure crop

105 views · 3 years ago



Annotate, filter and search data in OMERO

118 views · 3 years ago



Manage Data in OMERO

150 views · 3 years ago



Import Data using OMERO.insight

831 views · 3 years ago

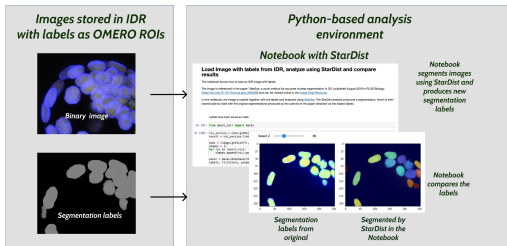
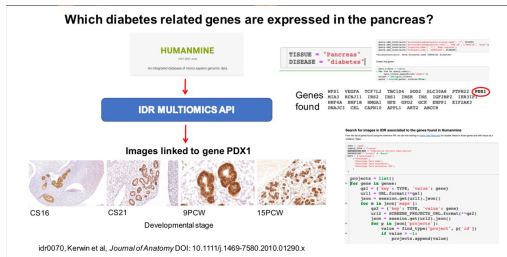


iviewer D 8 0

2.1K views · 4 years ago

OME Team tooling

Jupyter notebooks, scripts, environment.yml files

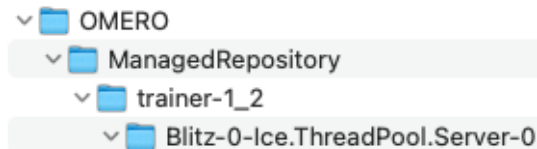


<https://github.com/ome/omero-guide-python>

<https://github.com/ome/EMBL-EBI-imaging-course-04-2024>

OME Team tooling

New: Download of Database of the training server with Image data
(already used in TiM 2023, Arizona)



<https://downloads.openmicroscopy.org/images/OMERO.tar.gz>

OME Team tooling

OMERO training server - available as collaboration

The screenshot displays the OMERO web interface. On the left, a sidebar shows 'My Groups' and 'ALL Groups'. Under 'My Groups', 'Lab1' is selected, and 'Elizabeth Blackwell' is highlighted as the current user. The main area is divided into two panes. The left pane is a file explorer showing a directory structure under 'Lab1 > Linda Buck', including folders like 'spc016_248', 'spc021_110', and 'A-Fig-dataset-6', and files like 'CSFY_10_rsd_D3D_PFU.dv'. The right pane shows a grid of 28 microscopy images, each with a thumbnail and a larger view. The images show various cellular structures stained with different colors (blue, red, green, yellow). A 'Zoom' slider is visible at the bottom right of the image grid.

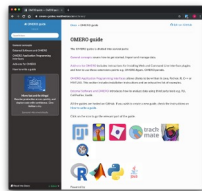
OME outreach feedback is valuable

- General suggestions about the feature design
- Testing: <https://github.com/GReD-Clermont/simple-omero-client/pull/65>
- Evaluation of the tooling
- Software workflow improvements: <https://github.com/ome/omero-viewer/pull/465>

Cross-reference strategy for tooling and guides ?



...



?



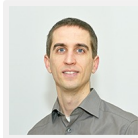
**Jason
Swedlow**



**Frances
Wong**



**Dominik
Lindner**



**Josh
Moore**



**Jean-Marie
Burel**

Past members

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Mark Carroll
Riad Gozim**

**Eleanor Willams
Simone Leo**

**Gabry Rustici
Ola Tarkowska**

Balaji Ramalingam

**Rafael Carazo-Salas
Balint Antal**

**Anatole Chessel
Simon Jupp
Tony Burdett**



**Petr
Walczysko**



**Will
Moore**



**David
Gault**



**Khaled
Mohamed**



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EMBL-EBI



Thank you

