

# Smithsonian Tropical Institute OMERO Workshop

## Summary

### Day 1

Imaging workflows in OMERO:

Import into OMERO

- Cover the various import options

OMERO core concepts

- Data management - Metadata, Users and groups
- Viewer -iviewer - concentrate on ROIs
- Import of metadata - CSV import scripts,
- Metadata plugin

OMERO figure

- How to use figure
- Using OMERO with QuPath

End of Day 1

### Day 2

Analysis of Images in OMERO using Machine Learning and Deep Learning Software Packages.

Analysis with 3rd party tools - principles

- Analysis with Fiji: manual
- Analysis with Fiji: scripting
- Data mining using OMERO.parade (Project/Dataset/Image)

Image data resource (IDR) - source of image data using OMERO API

Analysis environments & OMERO - case of Machine Learning tools:

- CellPose
- StarDist

Discussion about the Palynological workflows

- QuPath extension for StarDist
- ROIs export and import

## Content

### Import

In this section we will cover the various import options such as the import with or without data transfer and synchronous vs. asynchronous.

#### **Desktop client install and import**

For these 2 workflows shown in the workshop, see

<https://omero-guides.readthedocs.io/en/latest/upload/docs/import-desktop-client.html> and <https://omero-guides.readthedocs.io/en/latest/upload/docs/import-desktop-client.html#import-for-another-user>

#### **Command line import, bulk import, in-place import**

These import sections not covered in the workshop can be found at

<https://omero-guides.readthedocs.io/en/latest/upload/docs/import.html>

### OMERO core concepts

#### **Data management and cooperation**

See <https://omero-guides.readthedocs.io/en/latest/introduction/docs/data-management.html>

#### **Viewing images (OMERO.iviewer)**

<https://omero-guides.readthedocs.io/en/latest/iviewer/docs/iviewer.html>

#### **Annotate data and filter using annotations**

<https://omero-guides.readthedocs.io/en/latest/introduction/docs/annotate.html>

#### **Search**

<https://omero-guides.readthedocs.io/en/latest/introduction/docs/search-omero.html>

### OMERO figure

#### **Fast creation of publication figures using OMERO.figure**

See [https://omero-guides.readthedocs.io/en/latest/figure/docs/omero\\_figure.html](https://omero-guides.readthedocs.io/en/latest/figure/docs/omero_figure.html)

## Analysis

This part constitutes the core of the training and we will explore the different means OME provides to interact with image and non-image data and how to best integrate these into your workflows.

### Analysis with Fiji

- Analysis with Fiji: Java
  - Fiji client side: manual Analysis via UI
  - Fiji client side: scripting: Groovy and Macro
  - Fiji: Analysis in the cloud: Java and Macro

For setup of the Fiji plugin see

<https://omero-guides.readthedocs.io/en/latest/fiji/docs/installation.html>

For the walkthrough in this workshop, see Fiji chapters

<https://omero-guides.readthedocs.io/en/latest/fiji/docs/installation.html>

[https://omero-guides.readthedocs.io/en/latest/fiji/docs/threshold\\_manual.html](https://omero-guides.readthedocs.io/en/latest/fiji/docs/threshold_manual.html)

[https://omero-guides.readthedocs.io/en/latest/fiji/docs/threshold\\_scripting\\_macro\\_language.html](https://omero-guides.readthedocs.io/en/latest/fiji/docs/threshold_scripting_macro_language.html)

## OMERO parade

### Data mining using OMERO.parade on Projects and Plates

See [https://omero-guides.readthedocs.io/en/latest/parade/docs/omero\\_parade.html](https://omero-guides.readthedocs.io/en/latest/parade/docs/omero_parade.html)

### Analysis with CellPose

For the basic setup for CellPose, either

- (easier, environment will be set up on the cloud) Click on the Google Colab badge in [https://github.com/ome/EMBL-EBI-imaging-course-05-2023/blob/main/Day\\_4/setup.md](https://github.com/ome/EMBL-EBI-imaging-course-05-2023/blob/main/Day_4/setup.md)
- or
- (more rewarding, local setup) Follow the instructions in [https://github.com/ome/EMBL-EBI-imaging-course-05-2023/blob/main/Day\\_4/setup.md](https://github.com/ome/EMBL-EBI-imaging-course-05-2023/blob/main/Day_4/setup.md)

### Analysis with StarDist

For the basic setup for StarDist, either

- (more rewarding, local setup) Follow the instructions in [https://github.com/ome/EMBL-EBI-imaging-course-05-2023/blob/main/Day\\_4/setup.md](https://github.com/ome/EMBL-EBI-imaging-course-05-2023/blob/main/Day_4/setup.md)