

## OMERO & Fiji

Workshop: **FAIR data handling for microscopy: Structured metadata annotation in OMERO**

April 29th & 30th, 2024

Day 2 Session 8

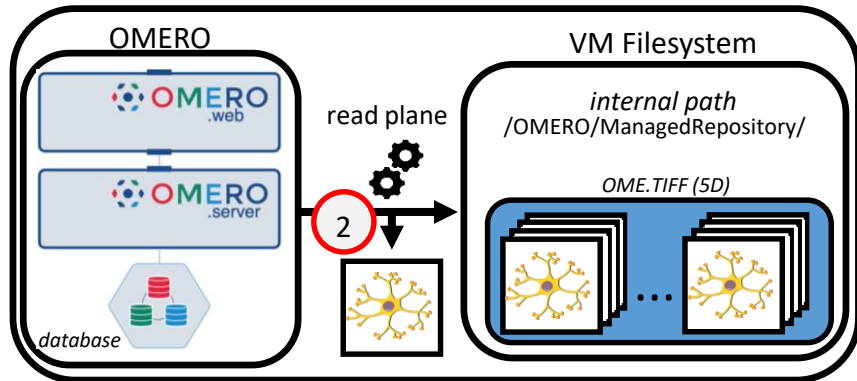
Trainer: Vanessa Fuchs, **Tom Boissonnet**, Christian Schmidt

30-04-2024

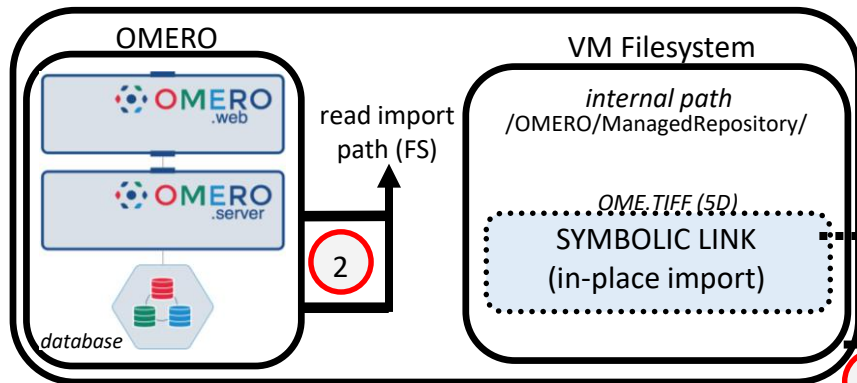
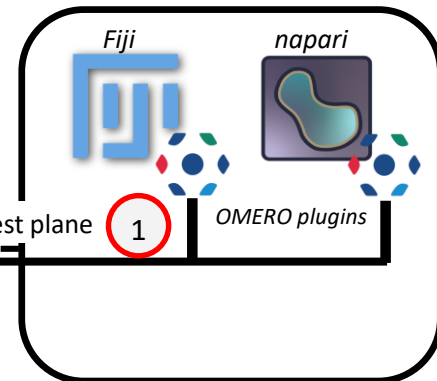


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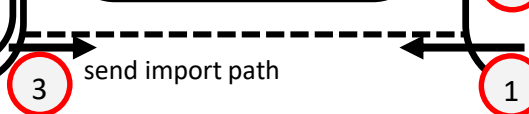
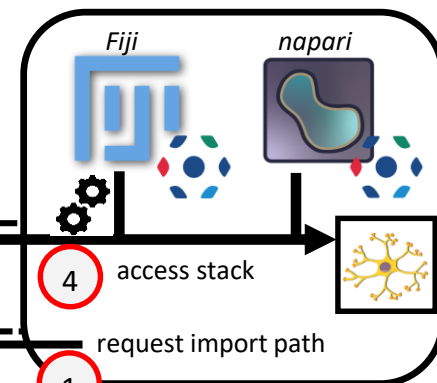
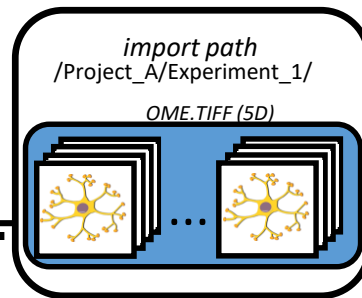
### OMERO Virtual Machine



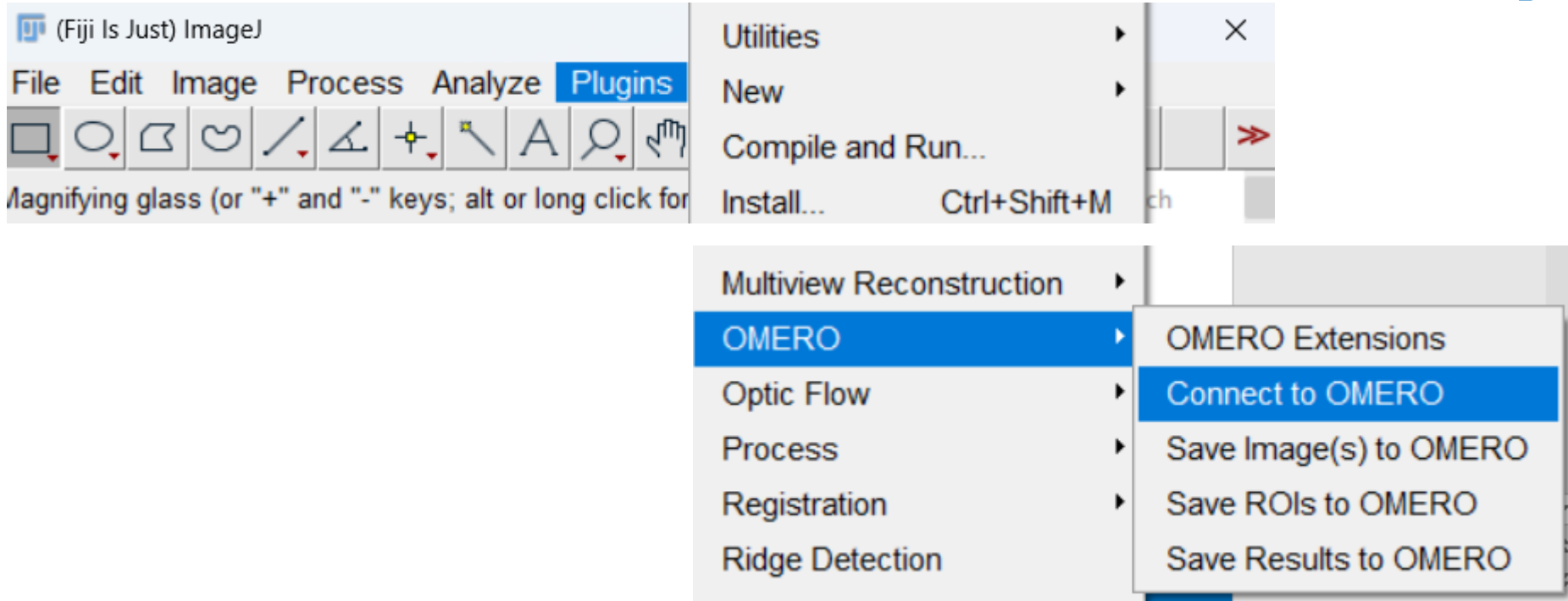
### Workstation



### Fileserver



# OMERO-Fiji plugin



The screenshot displays the Fiji software interface. At the top, the title bar reads "(Fiji Is Just) ImageJ". Below it is a menu bar with "File", "Edit", "Image", "Process", "Analyze", and "Plugins" (which is highlighted in blue). Underneath the menu bar is a toolbar with various icons for image manipulation. The "Plugins" menu is open, showing a list of options: "Utilities", "New", "Compile and Run...", "Install..." (with the keyboard shortcut "Ctrl+Shift+M"), "Multiview Reconstruction", "OMERO" (highlighted in blue), "Optic Flow", "Process", "Registration", and "Ridge Detection". The "OMERO" submenu is also open, listing: "OMERO Extensions", "Connect to OMEMO" (highlighted in blue), "Save Image(s) to OMEMO", "Save ROIs to OMEMO", and "Save Results to OMEMO".

The screenshot displays the OMERO.insight web interface. At the top, it shows the user 'Tom Boissonnet' is connected. The main interface is divided into three main sections:

- Projects Panel (Left):** A tree view showing a project structure. The selected path is 'Tom Boissonnet' > 'structuring\_exercise [60]' > 'Week1\_18746\_B02 [4]' > 'Week1\_150607\_B02\_s1\_c1.tif'. A red arrow points to the 'Screens' section at the bottom of this panel.
- Workspace (Center):** Titled 'Workspace: 4 of 4 images', it displays a row of four image thumbnails. The selected image is 'Week1\_150607\_B02\_s1\_c1.tif (15-Jun-2007)'. Below the thumbnails is a zoom slider.
- Image Details Panel (Right):** Provides metadata for the selected image. The image ID is 576, owned by Tom Boissonnet. The acquisition date is 2007-06-15 19:10:37, and the import date is 2024-04-25 15:59:45. The dimensions are 1280 x 1024 pixels, with a pixel size of 0.50x0.50 micrometers. The channels are DAPI, and the ROI count is 299.



# Bio-Formats importer

**Bio-Formats Import Options**

**Stack viewing**

View stack with:

Stack order:

**Metadata viewing**

Display metadata

Display OME-XML metadata

Display ROIs

ROIs Import Mode:

**Information**

**Display metadata** - Reads metadata that may be contained within the file format and displays it. You can save it as a text file or copy it from the File and Edit menus specific to the "Original Metadata" window. Readability depends upon the manner in which metadata is formatted in the data source. The metadata can also be displayed by pressing "i" (Image > Show Info) when the imported image is active.

**Dataset organization**

Group files with similar names

Open files individually

Swap dimensions

Open all series

Concatenate series when compatible

Stitch tiles

**Color options**

Color mode:

Autoscale

**Memory management**

Use virtual stack

Specify range for each series

Crop on import

**Split into separate windows**

Split channels

Split focal planes

Split timepoints

OK Cancel

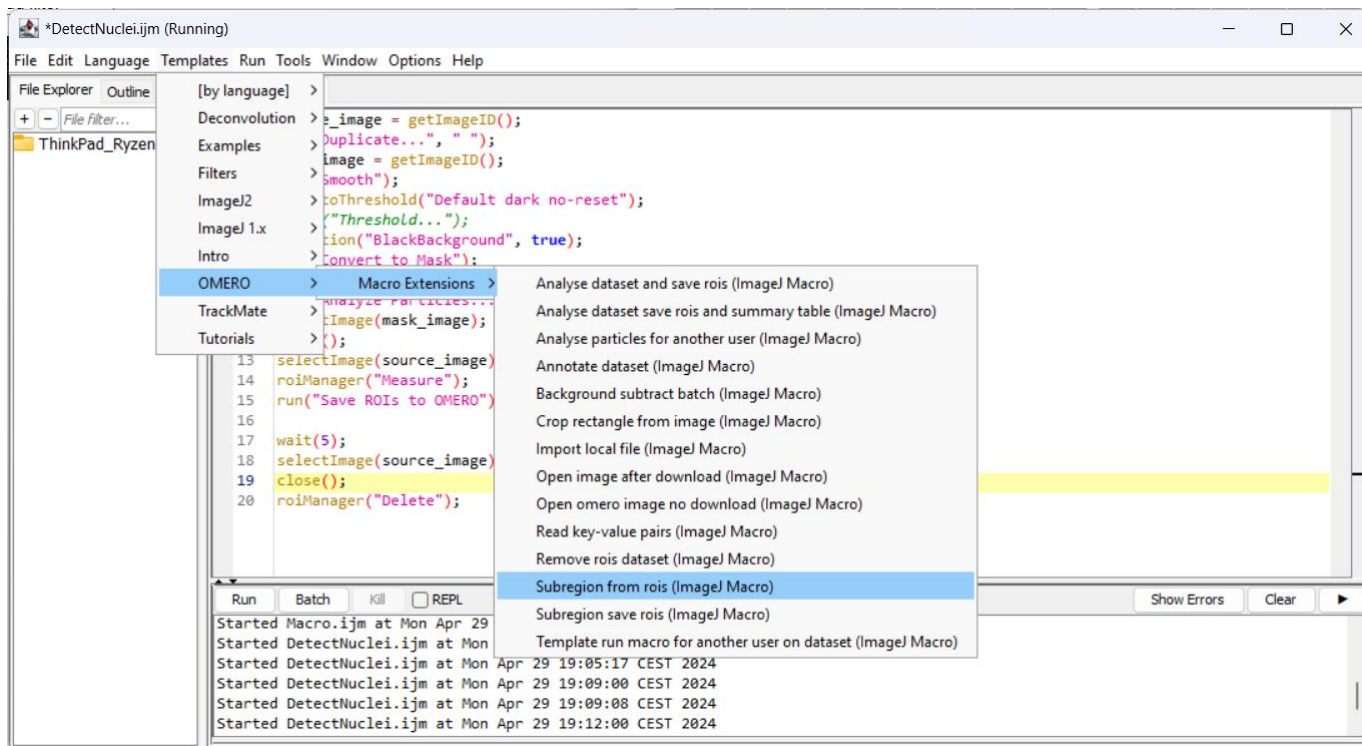
# Activity 1



- Goal is to familiarize with the connection to Fiji
  - Open images (plate from yesterday) from the Fiji-OMERO.insight client
  - Segment nuclei (manually or with your imageJ skills)
  - Measure the segmented nuclei and upload the results back to OMERO (ROIs and result table)
- Optional: you can use the macro attached to this project to segment your images:
  - With the search bar in Fiji, look at the different function used in the macro

- Do not use batch mode
- Careful with big images

# Automatizing - omero\_macro\_extension



# Activity 2

- Goal is to understand how image analysis can scale up
  - Download the macro attached to the project
  - This macro applies the nuclei detection to all images in a dataset
  - What is the result output?
- Look at the table attached to the dataset you processed
- Optional: have a look at the predefined examples
  - Load a subregion from ROI: try it with a reasonably small ROI on a histology image
  - Print a key-value pair from the macro: this could be used in the logic of your script when you need to pair images or get important parameters.



- Do not use batch mode
- Careful with big images