

Data Management with OMERO

Challenges in Image Data Management and
Analysis, EMBL Heidelberg, 2016

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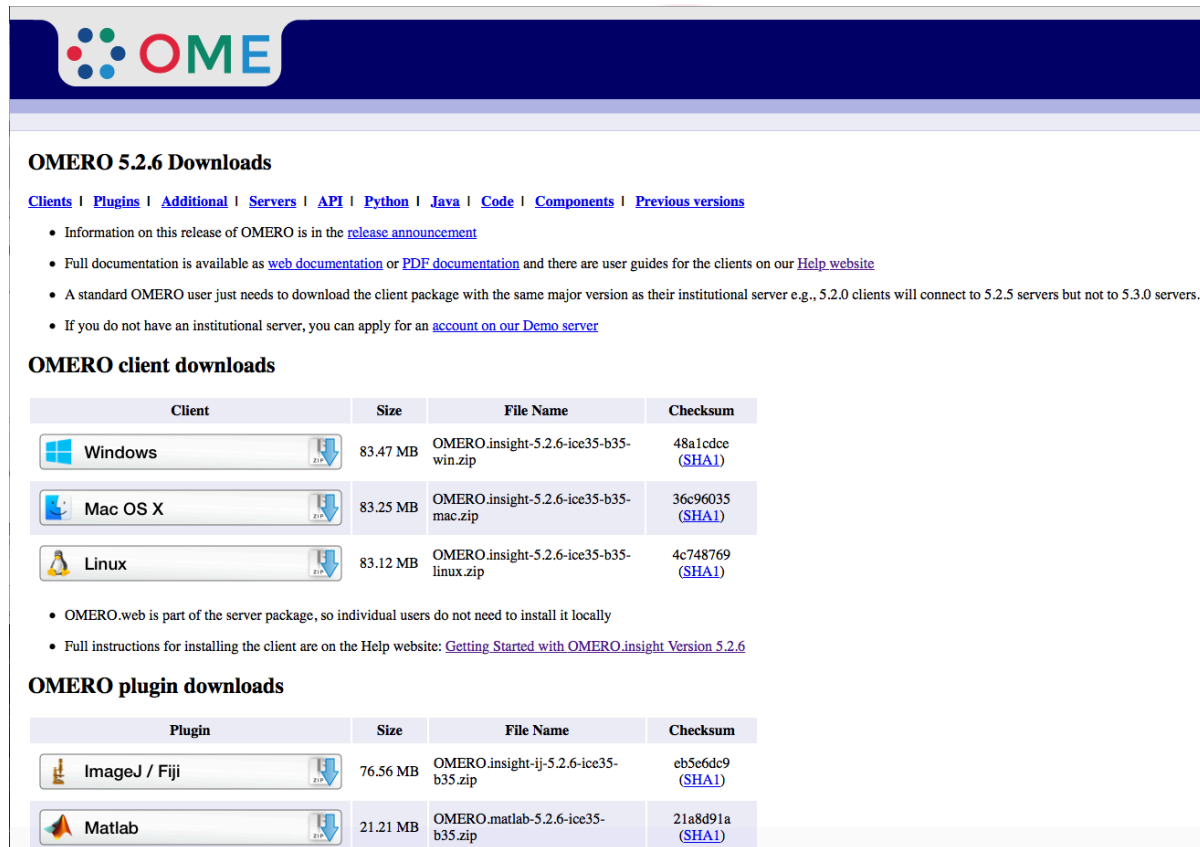
Open Microscopy Environment
Centre for Gene Regulation & Expression
School of Life Sciences, University of Dundee
Dundee, Scotland, UK



Outline

- Import Image Data into OMERO (Slides only)
- Image Data Organization with OMERO
- Image Data Annotation with OMERO
- Image Data Annotation and Search with OMERO
- Image Data Analysis with OMERO
- Batch Image Operations with OMERO
- Publishing with OMERO

Download Desktop Client









OMERO 5.2.6 Downloads

[Clients](#) | [Plugins](#) | [Additional](#) | [Servers](#) | [API](#) | [Python](#) | [Java](#) | [Code](#) | [Components](#) | [Previous versions](#)





- Information on this release of OMERO is in the [release announcement](#)
- Full documentation is available as [web documentation](#) or [PDF documentation](#) and there are user guides for the clients on our [Help website](#)
- A standard OMERO user just needs to download the client package with the same major version as their institutional server e.g., 5.2.0 clients will connect to 5.2.5 servers but not to 5.3.0 servers.
- If you do not have an institutional server, you can apply for an [account on our Demo server](#)

OMERO client downloads

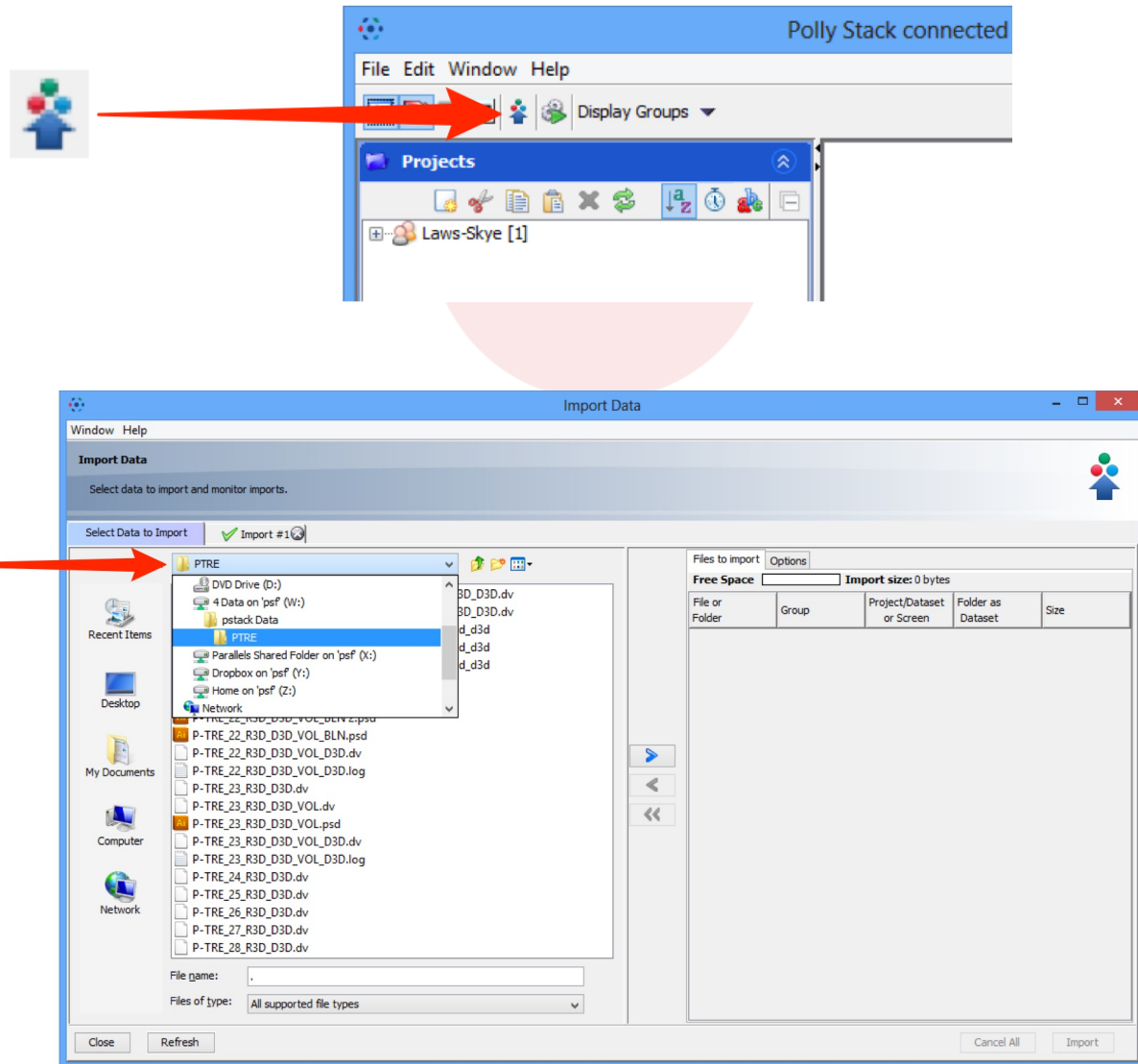
Client	Size	File Name	Checksum
 Windows 	83.47 MB	OMERO.insight-5.2.6-ice35-b35-win.zip	48a1cdce (SHA1)
 Mac OS X 	83.25 MB	OMERO.insight-5.2.6-ice35-b35-mac.zip	36c96035 (SHA1)
 Linux 	83.12 MB	OMERO.insight-5.2.6-ice35-b35-linux.zip	4c748769 (SHA1)

- OMERO.web is part of the server package, so individual users do not need to install it locally
- Full instructions for installing the client are on the Help website: [Getting Started with OMERO.insight Version 5.2.6](#)

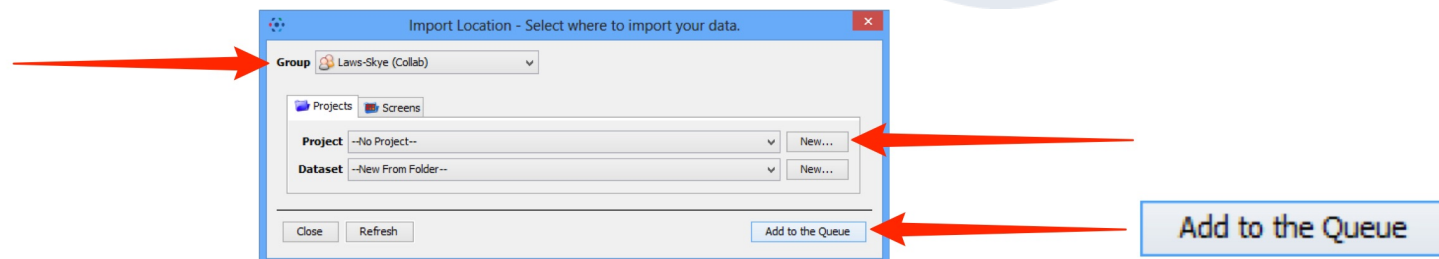
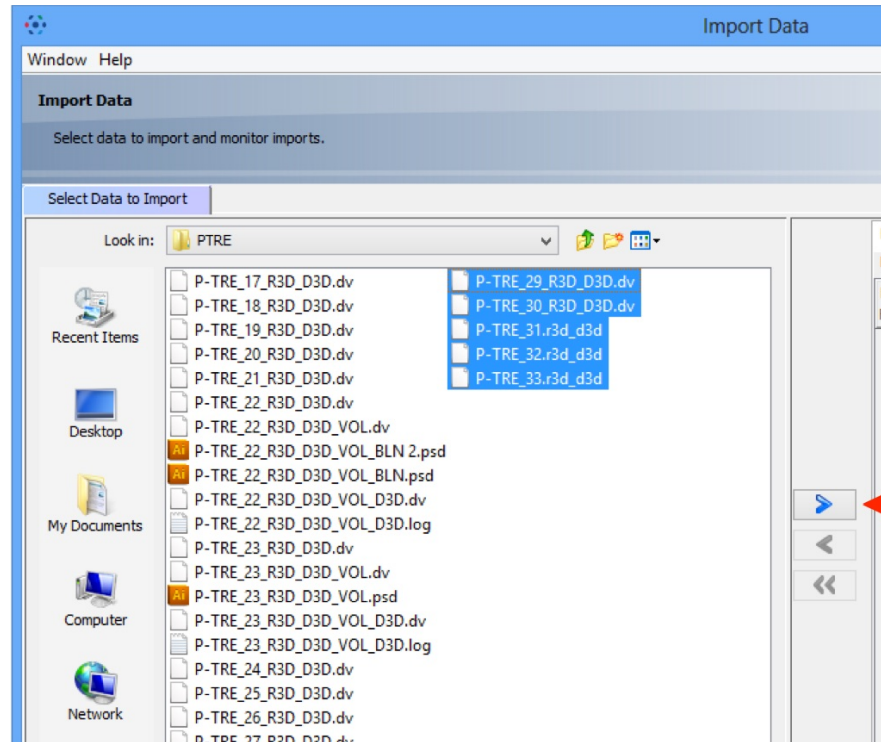
OMERO plugin downloads

Plugin	Size	File Name	Checksum
 ImageJ / Fiji 	76.56 MB	OMERO.insight-ij-5.2.6-ice35-b35.zip	eb5e6dc9 (SHA1)
 Matlab 	21.21 MB	OMERO.matlab-5.2.6-ice35-b35.zip	21a8d91a (SHA1)

Import Image Data into OMERO



Import Image Data into OMERO



Import Image Data into OMERO

The screenshot shows the OMERO 'Import Data' window. The window title is 'Import Data'. It has a menu bar with 'Window' and 'Help'. The main area is titled 'Import Data' and contains the text 'Select data to import and monitor imports.' Below this, there is a tab labeled 'Import #1'. The status bar shows 'Report: 3 out of 5 uploaded' and 'Import Size: 470 MB'. A 'Show Failed' button is visible. A message box states: 'When upload is complete, the import window and OMERO session can be closed. Reading will continue on the server.'

File Name	Upload Progress	Processing Status	Action
P-TRE_29_R3D_D3D.dv	130 MB	Complete	View
P-TRE_30_R3D_D3D.dv	140 MB	Complete	View
P-TRE_31.r3d_d3d	200 MB	Loading Pixels	Cancel
P-TRE_32.r3d_d3d	38/125 MB 2s Left	Pending...	Cancel
P-TRE_33.r3d_d3d	Pending...		Cancel

At the bottom of the window, there are buttons: 'Retry All', 'Submit All', 'Cancel All', and 'Close'.

A red arrow points from a 'Import #1' button (with a green checkmark) to the 'Import #1' tab in the window. Another red arrow points from a '5 Imported' status bar (with a green checkmark) to the 'Import #1' tab.

Image Data Organization with OMERO

The screenshot displays the OMERO web interface, which is used for organizing and managing image data. The interface is divided into several sections:

- Top Bar:** Contains the OMERO logo, navigation links (Data, History, Help, Tag Search, Figure), a search bar, and a user profile dropdown (Polly Stack).
- Left Panel (Explore):** Shows a hierarchical tree structure of the data. Under 'Polly Stack', there is a folder 'Nature Paper 2' containing a sub-folder 'Figure 1 10'. This folder contains several image files, with 'P-TRE_22_R3D_D3D.dv' selected. Other folders include 'Figure 2 5', 'Porter 2', 'PTRE 11', 'HCS 1', and 'Orphaned Images'.
- Center Panel (Thumbnails):** Displays a grid of image thumbnails. The selected image, 'P-TRE_22_R3D_D3D.dv', is highlighted with a blue border. A 'Filter Images' search bar is located above the grid.
- Right Panel (General):** Provides detailed information about the selected image.
 - General Tab:** Shows the image name 'P-TRE_22_R3D_D3D.dv', Image ID '25763', and Owner 'Polly Stack'. It also includes a 'Show all' button.
 - Image Details:** A dropdown menu that is currently expanded, showing 'collected with critical illumination'.
 - Metadata:** A table of image properties:

Import Date:	2015-10-27 13:48:34
Dimensions (XY):	512 x 512
Pixels Type:	int16
Pixels Size (XYZ) (μm):	0.07 x 0.07 x 0.20
Z-sections/Timepoints:	40 x 1
Channels:	457.0, 528.0, 617.0
ROI Count:	0
 - Tags:** A dropdown menu showing 'Nature - Figure 1'.
 - Key-Value Pairs:** A section for additional metadata.
 - Attachments:** A section for related files.
 - Ratings:** A section showing a star rating (4 stars) and the text '(avg: 4 / 1 votes)'.
 - Comments:** A section for user comments.

Image Data Organization with OMERO

The screenshot displays the OMERO web interface. On the left, a tree view shows a hierarchy of data: 'Demo data' -> 'idr0001-grami-sysgro/screenA 46' -> 'JL_121214_J1_1' -> 'Meas_01(2012-12-14_13-40-07)' through 'Meas_06(2012-12-14_17-01-59)'. The main panel shows a grid of 48 images (8x6) labeled A-H and 1-8. The right panel provides detailed acquisition information for 'JL_121214_J1_1 [Well F-6; Field #1]':

- Image ID: 706266
- Well ID: 476542
- Owner: Demo User
- Acquisition Date: 2012-12-14 17:20:07
- Import Date: 2015-10-01 11:07:05
- Dimensions (XY): 1376 x 1040
- Pixel Type: uint16
- Pixel Size (XYZ) (µm): 0.11 x 0.11
- Z-sections/Timepoints: 16 x 1
- Channels: GFP, CasBlue
- ROI Count: 0
- Status: None

Below this, an 'ANNOTATIONS' section lists gene identifiers and phenotypes. At the bottom, a 'Viewing Options' panel allows for image manipulation (Zoom, Line Plot, Channels, etc.). The main image viewer shows a single image with a 'Z-sections' slider on the left and a 'Timepoints' slider at the bottom.

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Image Data Organization in OMERO

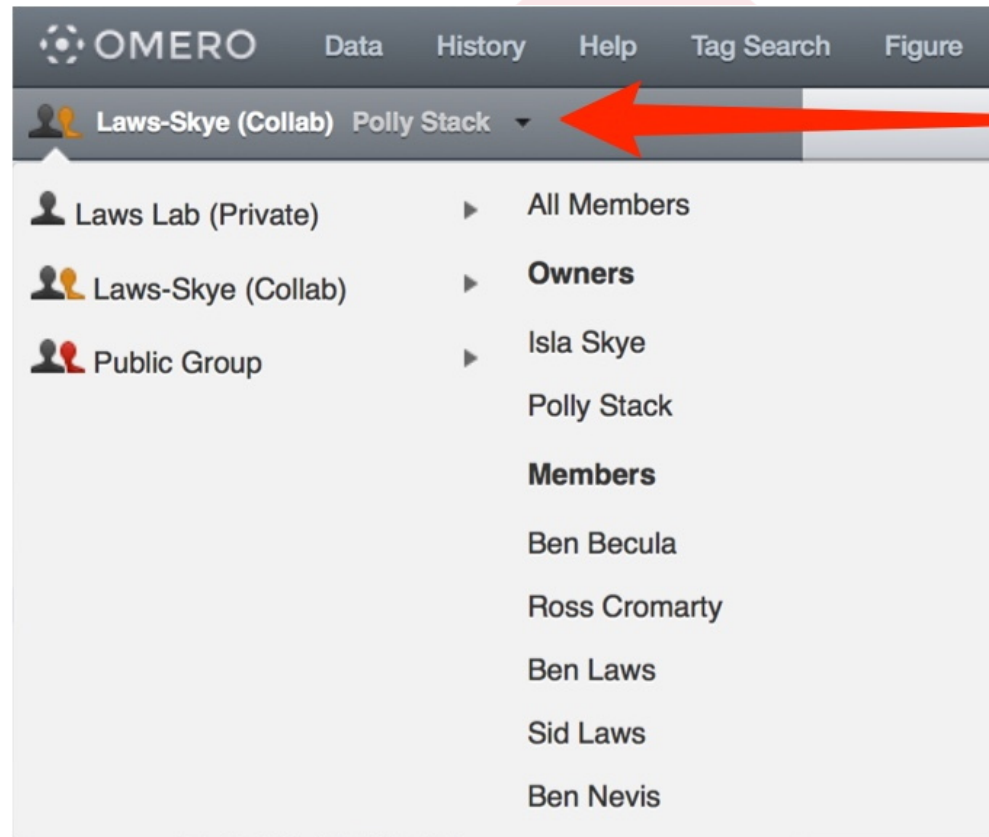


Image Data Annotation with OMERO

General Acquisition Preview

Full viewer

P-TRE_22_R3D_D3D.dv

Image ID: 25763
Owner: Polly Stack Show all

Image Details

collected with critical illumination

Import Date: 2015-10-27 13:48:34
Dimensions (XY): 512 x 512
Pixels Type: int16
Pixels Size (XYZ) (µm): 0.07 x 0.07 x 0.20
Z-sections/Timepoints: 40 x 1
Channels: 457.0, 528.0, 617.0
ROI Count: 0

Tags

Nature - Figure 1

Key-Value Pairs

Attachments

Ratings

★★★★★
(avg: 4 / 1 votes)

Comments



Key-Value Pairs

Added by: Polly Stack

Key	Value
Temperature	37.5
pH	7.4
Incubation	1 hr

Added by: Isla Skye

Date	15-02-20
Experiment	3
Run	2



Tags

Key-Value Pairs

Attachments

Ratings

Comments

Image Data Annotation and Search with OMERO

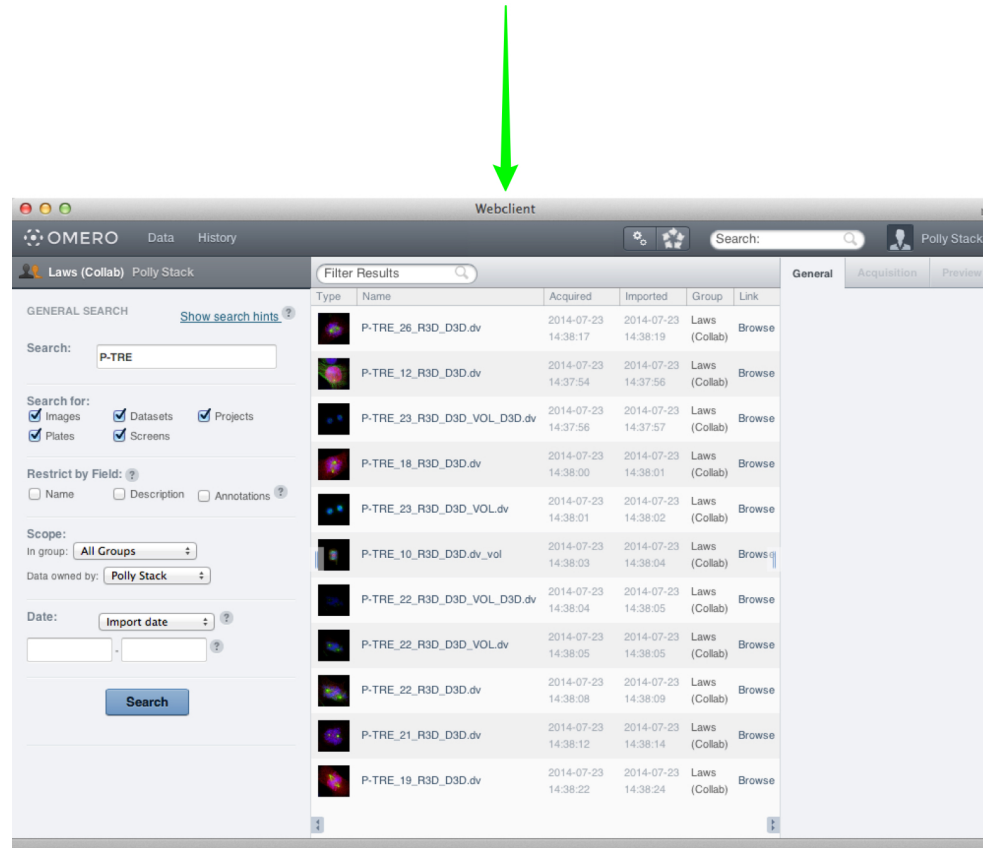
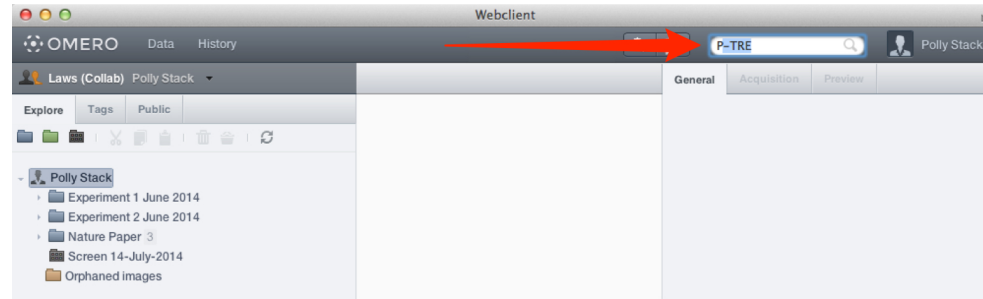
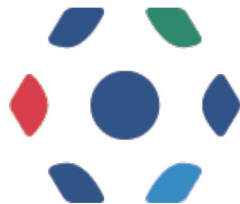


Image Data Analysis with OMERO

Analysis Within OMERO



3rd Party Integrations

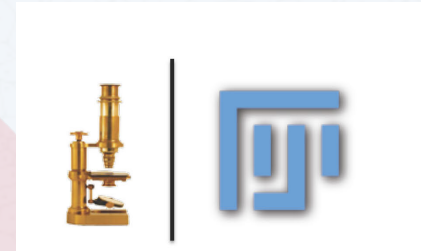


Image
Processing



Data
Processing

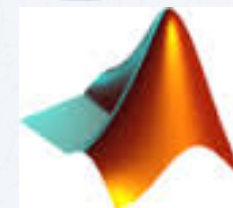
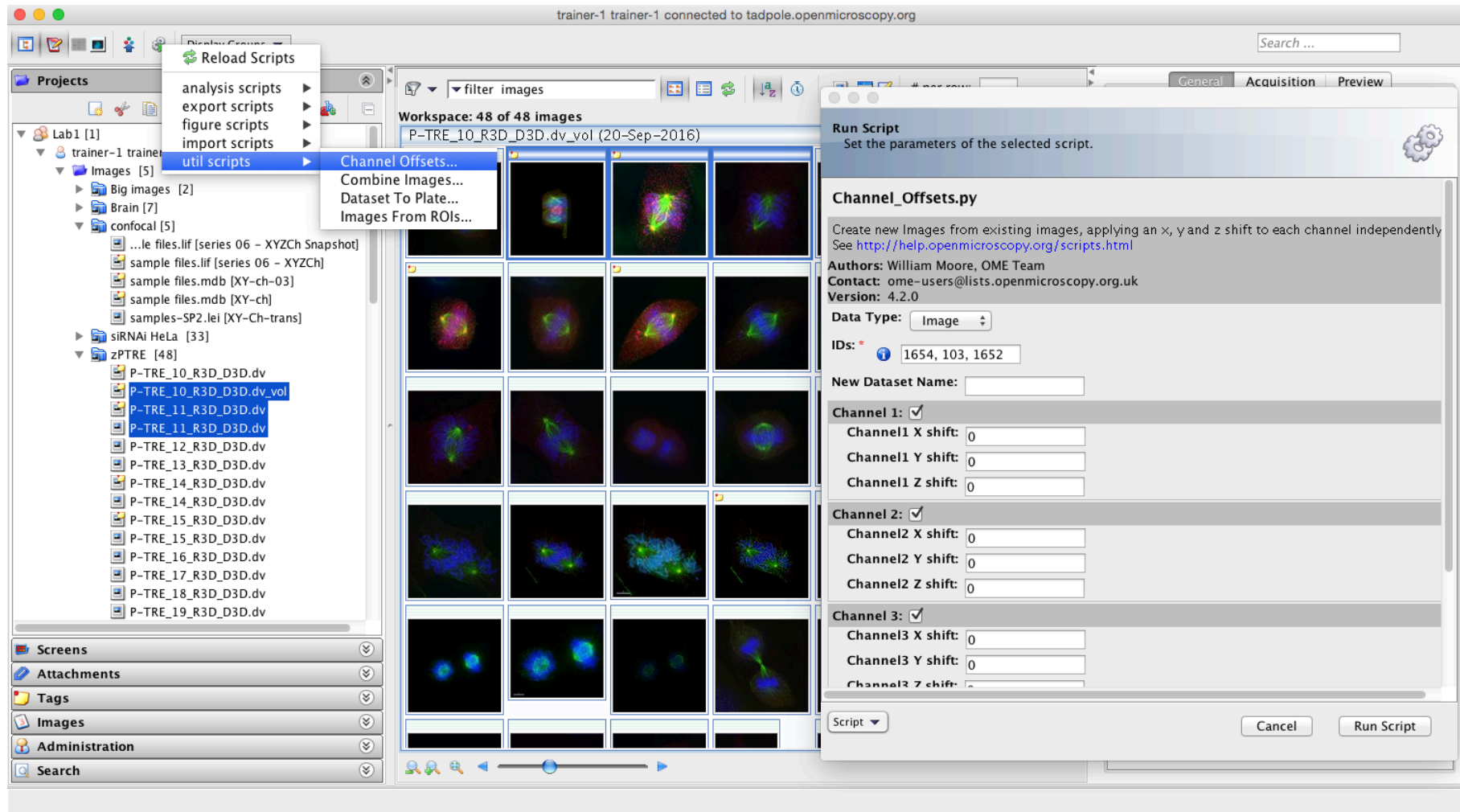


Image and
Data
Processing



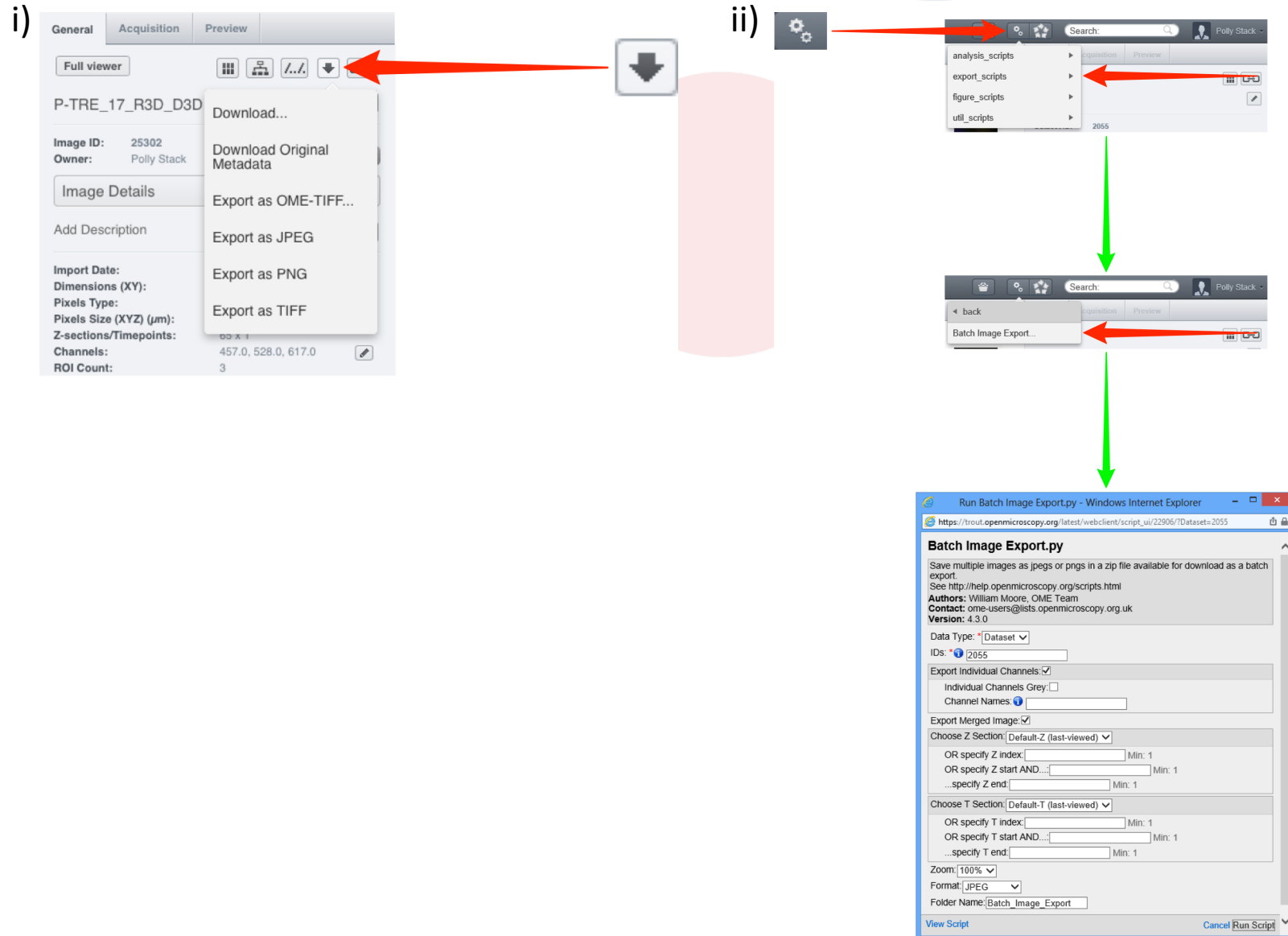
Image Data Analysis within OMERO



Lets Try:

- **Images From ROIs:** Create new Images from the regions defined by Rectangle ROIs on other Images. Designed to work with single-plane images ($Z=1$ $T=1$) with multiple ROIs per image.

Batch Image Operations with OMERO



Publishing with OMERO

The screenshot shows the OMERO interface with the 'Create Split View Figure' dialog box open. The dialog has several tabs: 'General', 'Acquisition', and 'Preview'. The 'General' tab is active, showing a 'Figure Name' field set to 'Split_View_Figure' and a 'Format' dropdown set to 'JPEG'. Below this, there are checkboxes for 'Show Scalebar' (unchecked), 'Length (microns)' (set to 5), and 'Overlay Colour' (set to 'White'). There are also input fields for 'Panel Width' (512) and 'Panel Height' (512). A 'Z section: Last Viewed' section has two radio buttons: 'Last Viewed' (selected) and 'Z Projection' (unchecked). At the bottom, there is a section for 'Image Name' with a dropdown menu and three color-coded checkboxes (blue, green, red) for '457.0', '528.0', and '617.0'. To the right of these are three 'Merged Names' checkboxes (blue, green, red) which are all checked. Below this is a grid of image thumbnails showing the results of the split view figure creation. The grid has four columns labeled '457.0', '528.0', '617.0', and a merged column labeled '457.0', '528.0', '617.0'. The rows are labeled 'P-TRE_17_R3D_D3D.dv', 'P-TRE_22_R3D_D3D_VOL.dv', and 'P-TRE_24_R3D_D3D.dv'. At the bottom of the dialog, there is a 'View Script' button and a 'Create Figure' button.

OMERO

Create Split View Figure

Figure Name: Format:

Show Scalebar: ☐ Length (microns): Overlay Colour:

Panel Width: Panel Height:

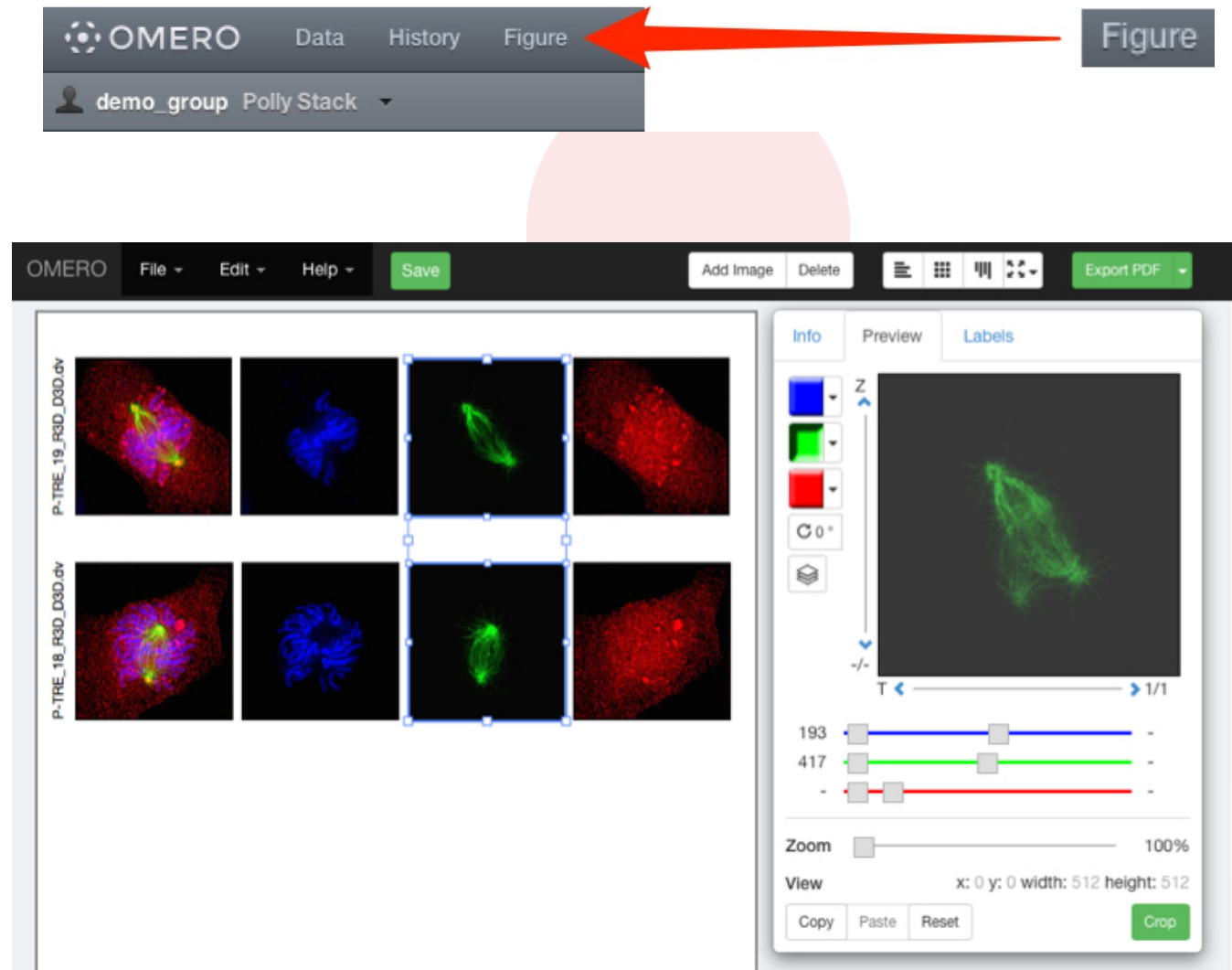
Z section: Last Viewed: ☒ Z Projection: ☐

Image Name ☒ ☒ ☒ Split Panels Grey: ☐ Merged Names: ☒ ☒ ☒

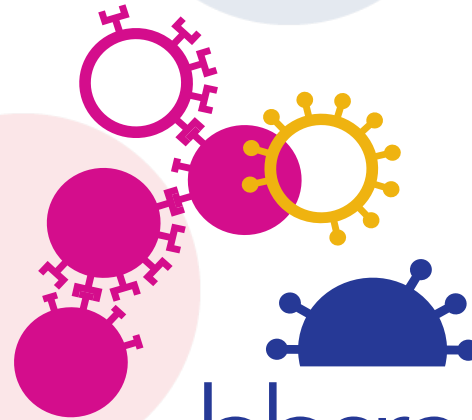
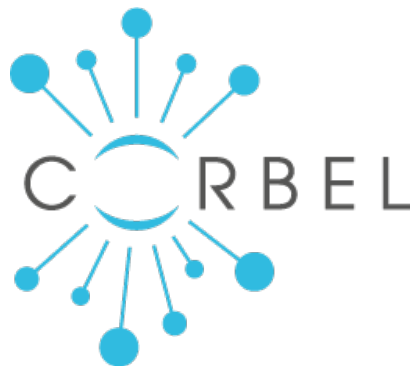
	457.0	528.0	617.0	457.0 528.0 617.0
P-TRE_17_R3D_D3D.dv				
P-TRE_22_R3D_D3D_VOL.dv				
P-TRE_24_R3D_D3D.dv				

View Script

Publishing with OMERO



Thank to Funders



biotechnology and biological sciences
research council



OME Consortium



Paul
French

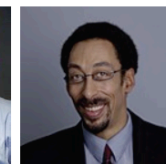
Gaudenz
Danuser

Ilan
Davis

Gianluigi
Zanetti



Peter
Sorger



Spencer
Shorte



Alvis
Brazma



Rafael
Carazo-Salas



Edouard
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