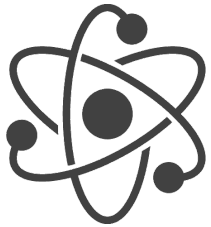
Using Volume EM Containers

An Introduction with DAaaS Training



The Rosalind Franklin Institute

Science and Technology Facilities Council

Scientific Computing

Are these slides for you?

- Looking to get started with volume EM software:

Napari, Fiji, IMOD, MIB

- Little-to-no computing experience
- Recommended: Access to DAaaS Training Workspace

What are Containers?

Containers are a software bundle that includes everything a computer program needs to run.

Think of a physical CD 💿 with a preinstalled application: you can insert it into any computer and run the program immediately—no tricky installation required!

RFI Volume EM Containers

As a CCP-VolumeEM initiative, the Rosalind Franklin Institute (RFI) has created container 'CDs' for:

1. Napari with CLEM-Reg and Empanada Plugins
2. Fiji with MoBIE
3. IMOD
4. MIB2

The following slides give an overview of **1–4**. Further details and links to additional learning materials are in our documentation.

RFI Volume EM Containers (2)

The aim of the container initiative is to increase accessibility of volume EM software.

DAaaS users: the containers are already loaded on the training workspace, go to `Applications > Software` (bottom-left of screen).

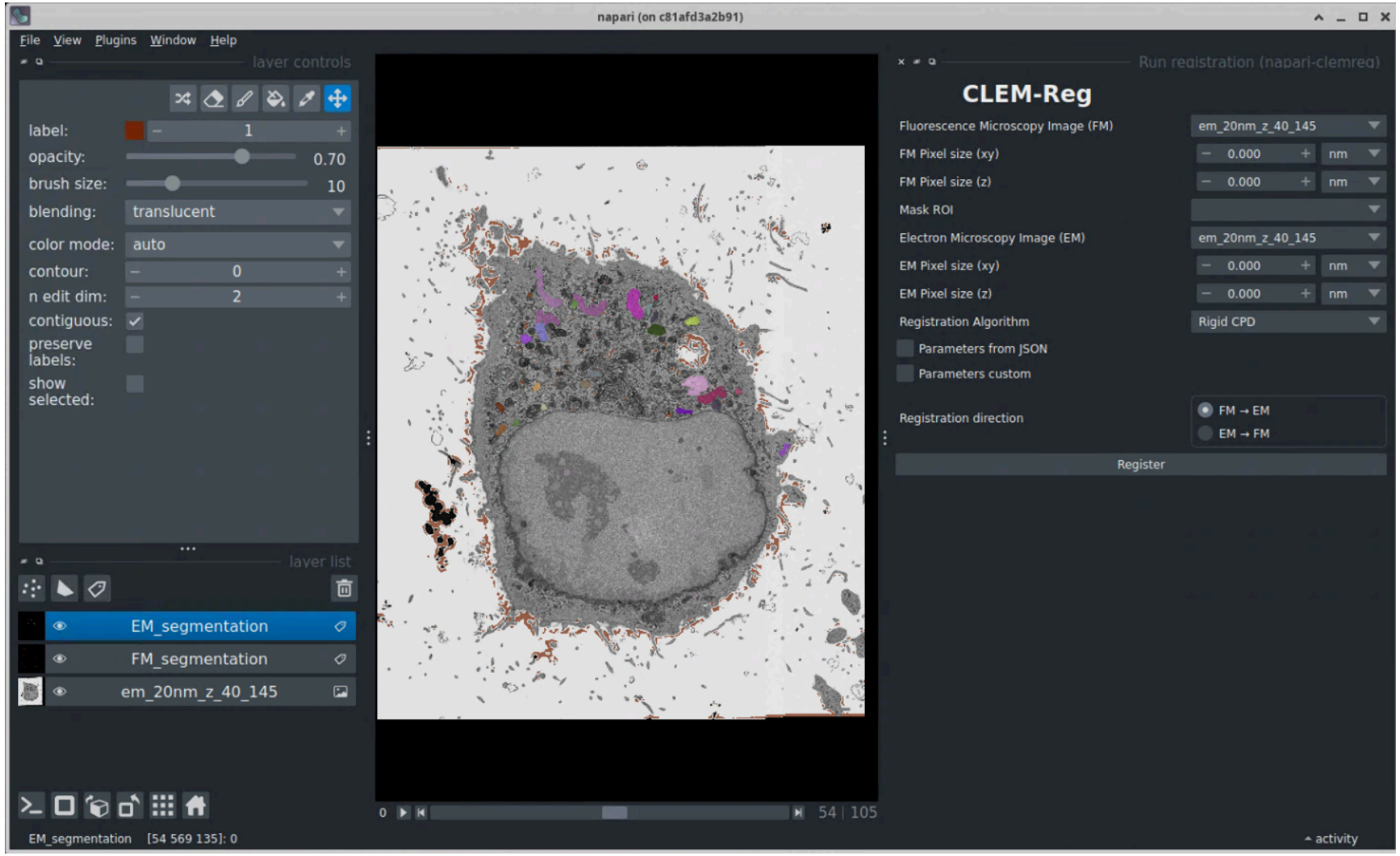
Want to use the containers elsewhere? We suggest asking your computing team to help get up and running using Apptainer or Docker.

Napari with CLEM-Reg and Empanada

Napari is a modern interactive viewer with plugins for automated registration and segmentation in EM.

Use for: automated point cloud based registration (CLEM-Reg) and deep-learning segmentation of 2D/3D cellular structures (Empanada).

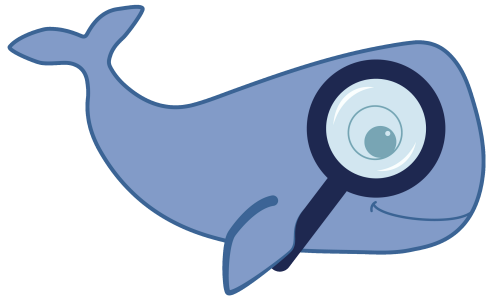
What Napari looks like (CLEM-Reg)



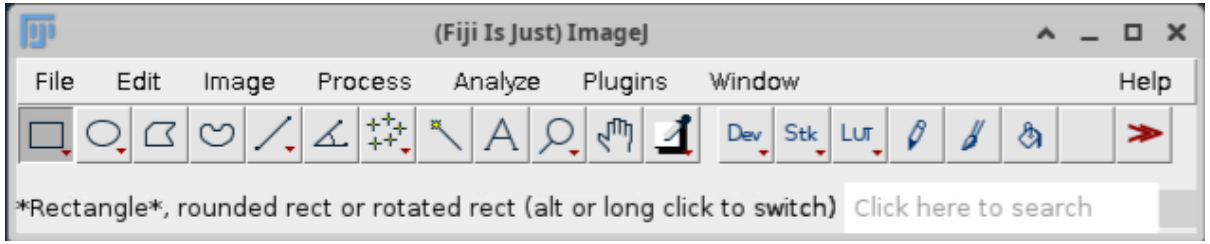
Fiji with MoBIE

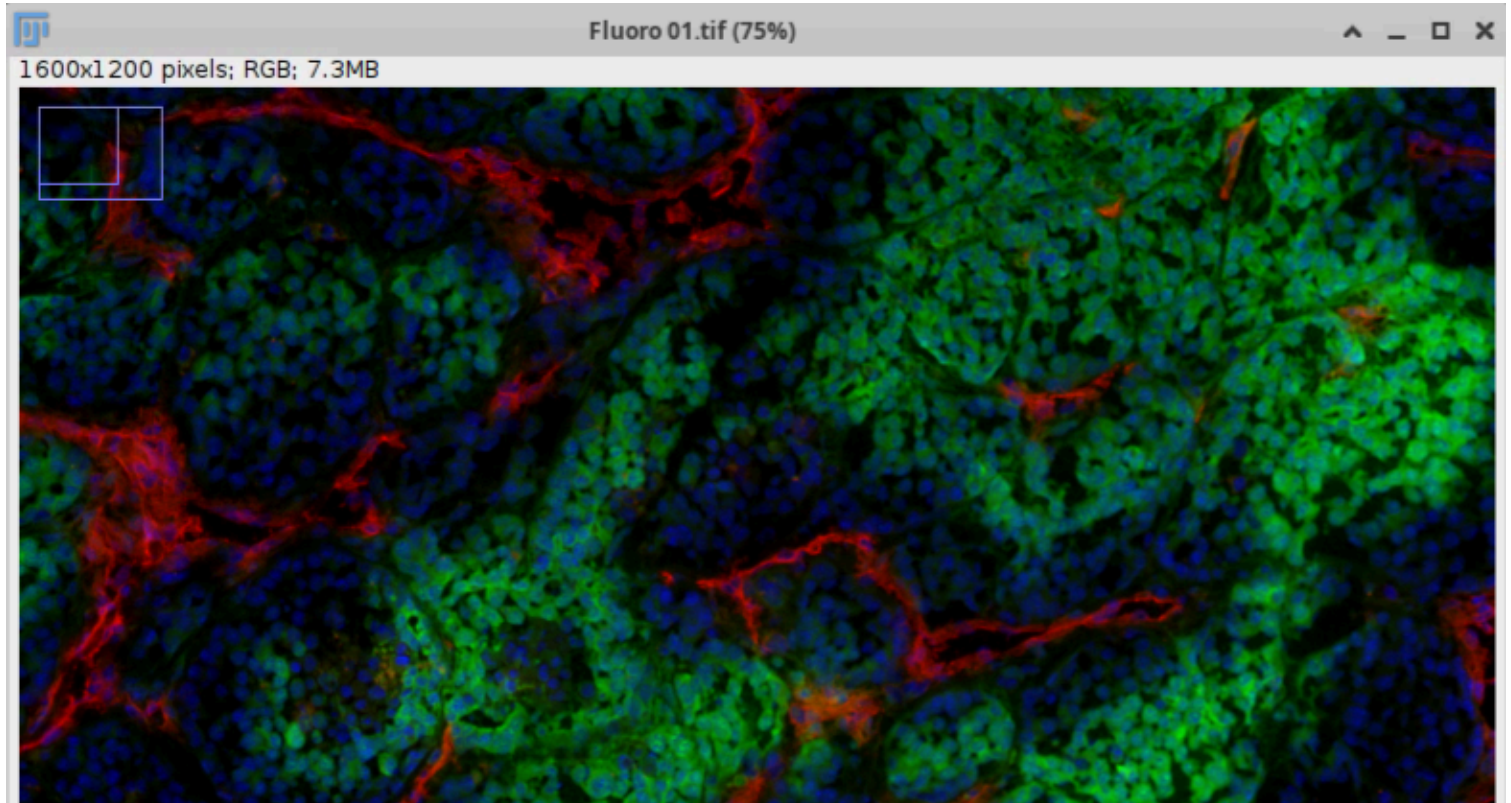
Fiji is a widely-used image processing application that uses the ImageJ platform. The MoBIE plugin adds support for large multi-modal images and tabular data.

Use for: Quick and general-purpose image processing, exploring big image sequences and associated tabular data.



What Fiji looks like





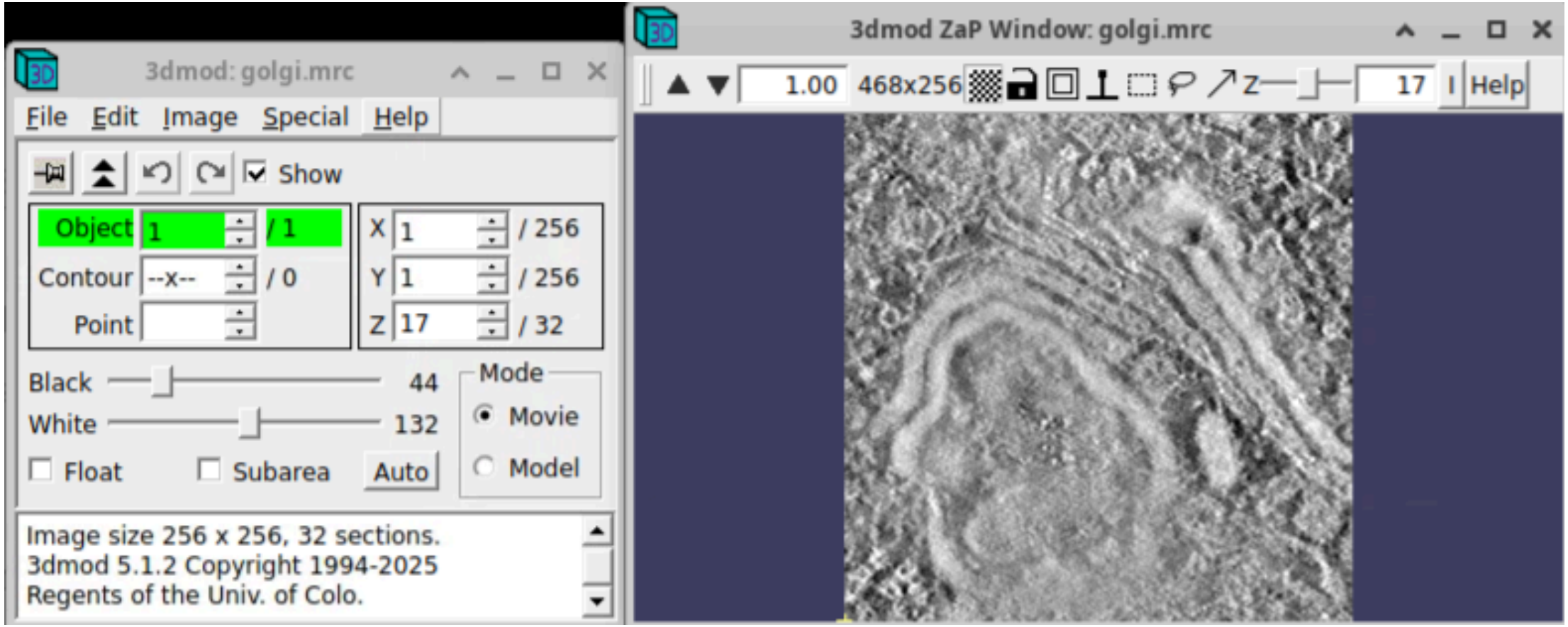
IMOD

IMOD is a bundle of programs for tomographic reconstruction, visualisation and annotation. The main program for viewing and segmenting images is called **3dmod**.

Use for: Aligning and reconstructing tomograms from TEM tilt series (etomo) and 3D visualisation of any volume EM (TEM and SEM) datasets with segmentation (3dmod).

As IMOD comprises many programs, you must run `3dmod` (or `etomo`) in a **Terminal** (type `3dmod` and press enter).

What IMOD looks like (3dmod)

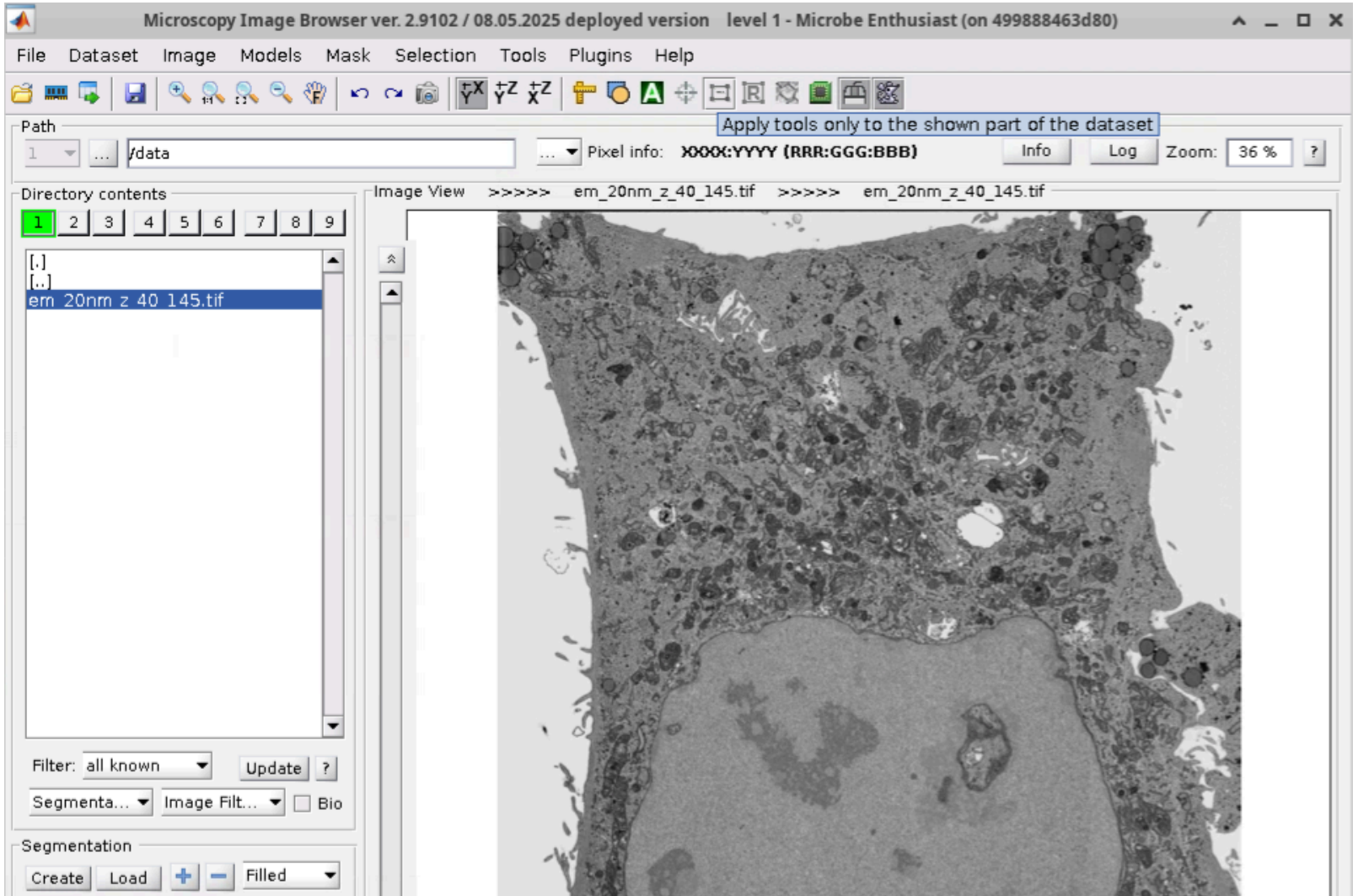


MIB2

Microscopy Image Browser (MIB) is a user-friendly tool for segmenting and measuring structures in large 3D/4D datasets.

Use for: Annotating regions of interest, extracting quantitative measurements (volumes, surfaces, statistics).

What MIB2 looks like



Wrap-up

CCP-volumeEM containers were created to make image analysis software more accessible

Keep an eye on the vEM Event List for training and other community events!

Questions? Suggestions? Create an issue on our documentation repository to let us know.