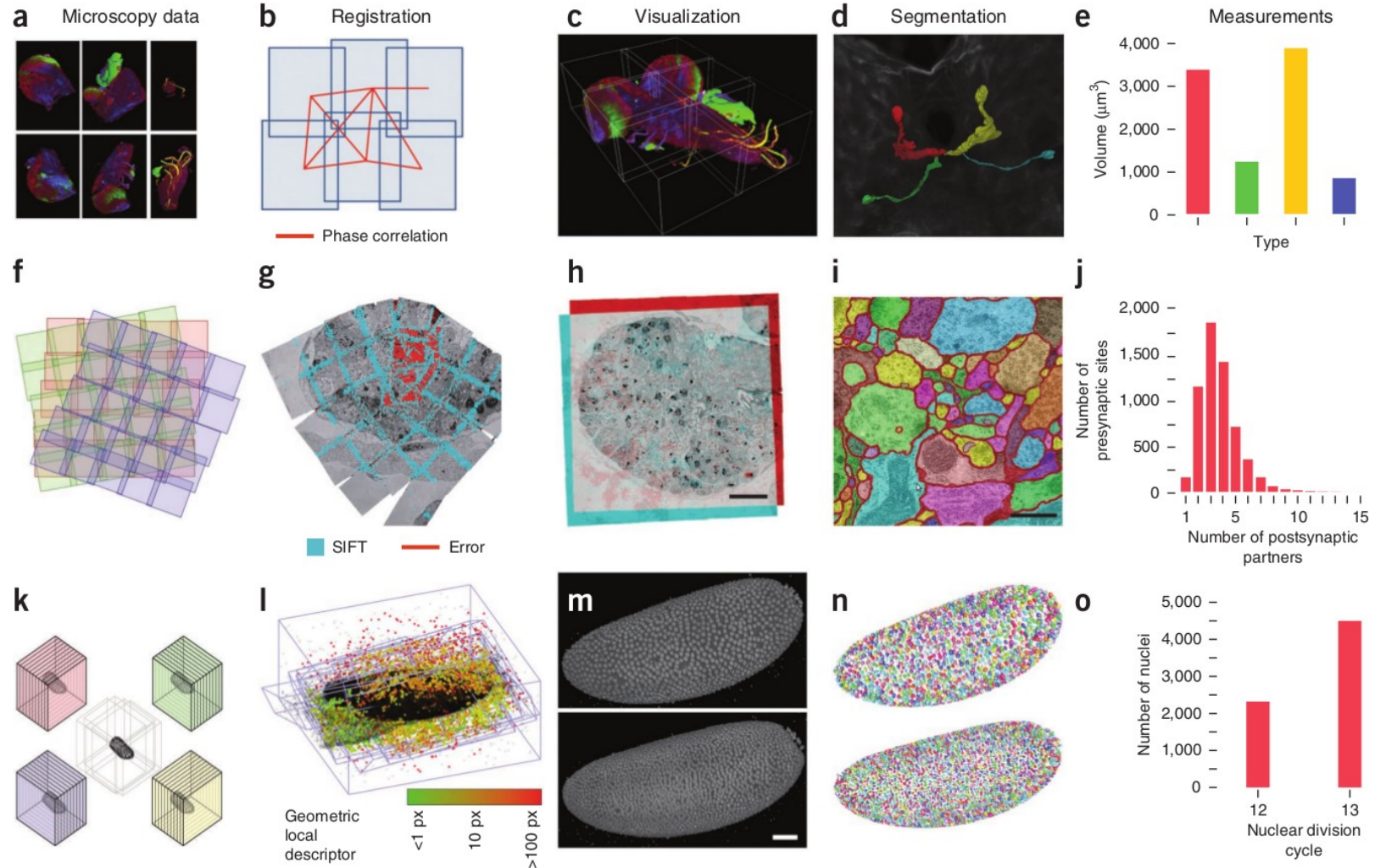


Image Analysis with Fiji



<http://fiji.sc/>

What is Fiji?



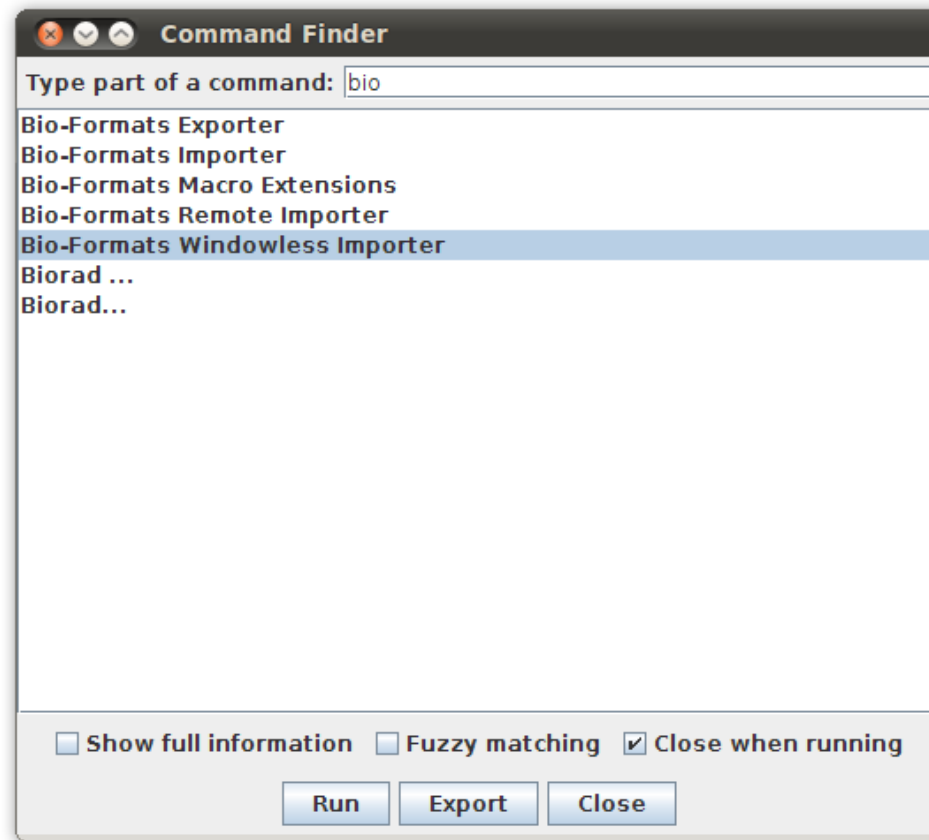
http://fiji.sc/Fiji_Usage_weekly

Who uses Fiji?



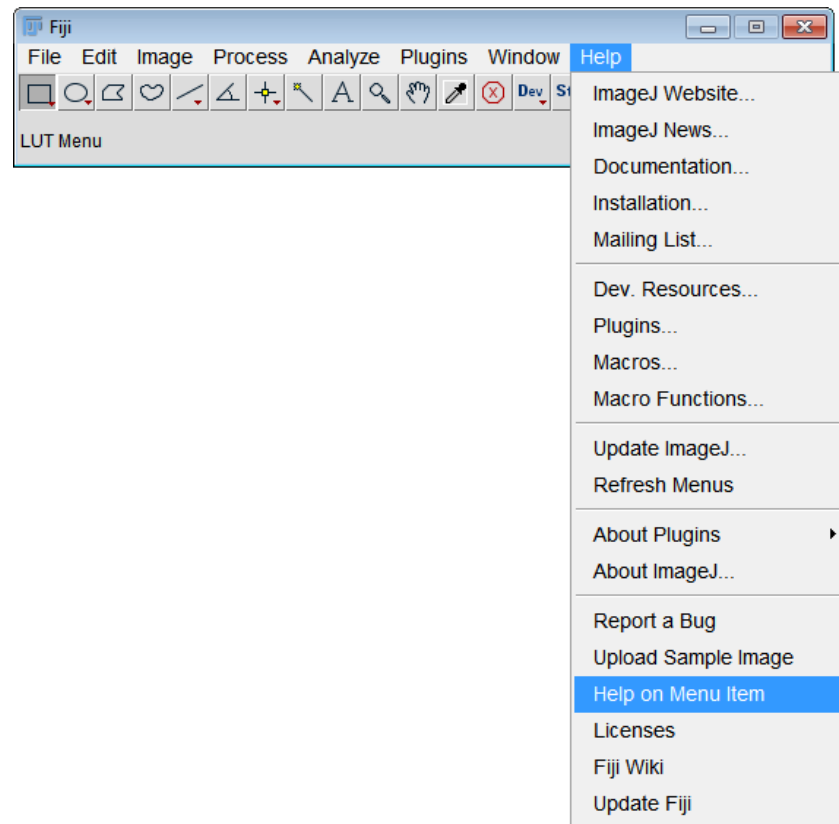
http://fiji.sc/Fiji_Usage_weekly

Teaching how to fish: *Command Finder (Ctrl+L)*



http://fiji.sc/Command_Finder

Teaching how to fish: Help on Menu Item



http://fiji.sc/Help_on_Menu_Item

Teaching how to fish: Help>Fiji Wiki



The screenshot shows the Fiji Wiki homepage. At the top is a blue navigation bar with links for Navigation, Content, Highlights, Toolbox, and Login. A search bar is highlighted with a red circle. Below the navigation bar, the main content area features the title "Fiji Is Just ImageJ" with social media sharing buttons (Like, Send, Tweet). A short URL is provided. The main text describes Fiji as an image processing package, a distribution of ImageJ (and soon ImageJ2) together with Java, Java 3D and a lot of plugins organized into a coherent menu structure. It compares Fiji to ImageJ as Ubuntu compares to Linux. The main focus of Fiji is to assist research in life sciences. For users, Fiji is easy to install and has an automatic update function, bundles a lot of plugins and offers comprehensive documentation. For developers, Fiji is an open source project hosted in a Git version control repository, with access to the source code of all internals, libraries and plugins, and eases the development and scripting of plugins. A "Download Fiji now" button is present. Below this is a "How to cite Fiji?" section. The "News" section lists several updates from 2012. The "Collaboration" section states that the Fiji project is driven by a strong desire to improve the tools available for life sciences to process and analyze data. To this end, Fiji collaborates closely with the following projects: ImageJ2, Bio-Formats, OME, µManager, and KNIME. Each project is represented by a logo.

Fiji Is Just ImageJ +1 138 39

Like 262 Send

short URL

Fiji is an image processing package. It can be described as a distribution of [ImageJ](#) (and soon [ImageJ2](#)) together with Java, Java 3D and a lot of plugins organized into a [coherent menu structure](#). Fiji compares to ImageJ as Ubuntu compares to Linux.

The main focus of Fiji is to assist research in life sciences.

For users, Fiji is [easy to install](#) and has an automatic update function, bundles a [lot of plugins](#) and offers [comprehensive documentation](#).

For developers, Fiji is an open source project hosted in a [Git version control repository](#), with access to the source code of all internals, libraries and plugins, and eases the [development](#) and [scripting](#) of plugins.

Download Fiji now

How to cite Fiji?

News

- 2012-09-14 - The Updater moved
- 2012-07-20 - TrakEM2 published in PLoS ONE
- 2012-06-29 - Fiji papers at Nature Methods
- 2012-06-16 - Elastic registration published in Nature Methods
- 2012-05-10 - New plugin: TrackMate

Subscribe to an RSS or Atom feed of the [Fiji news](#).
Browse the [news archive](#).

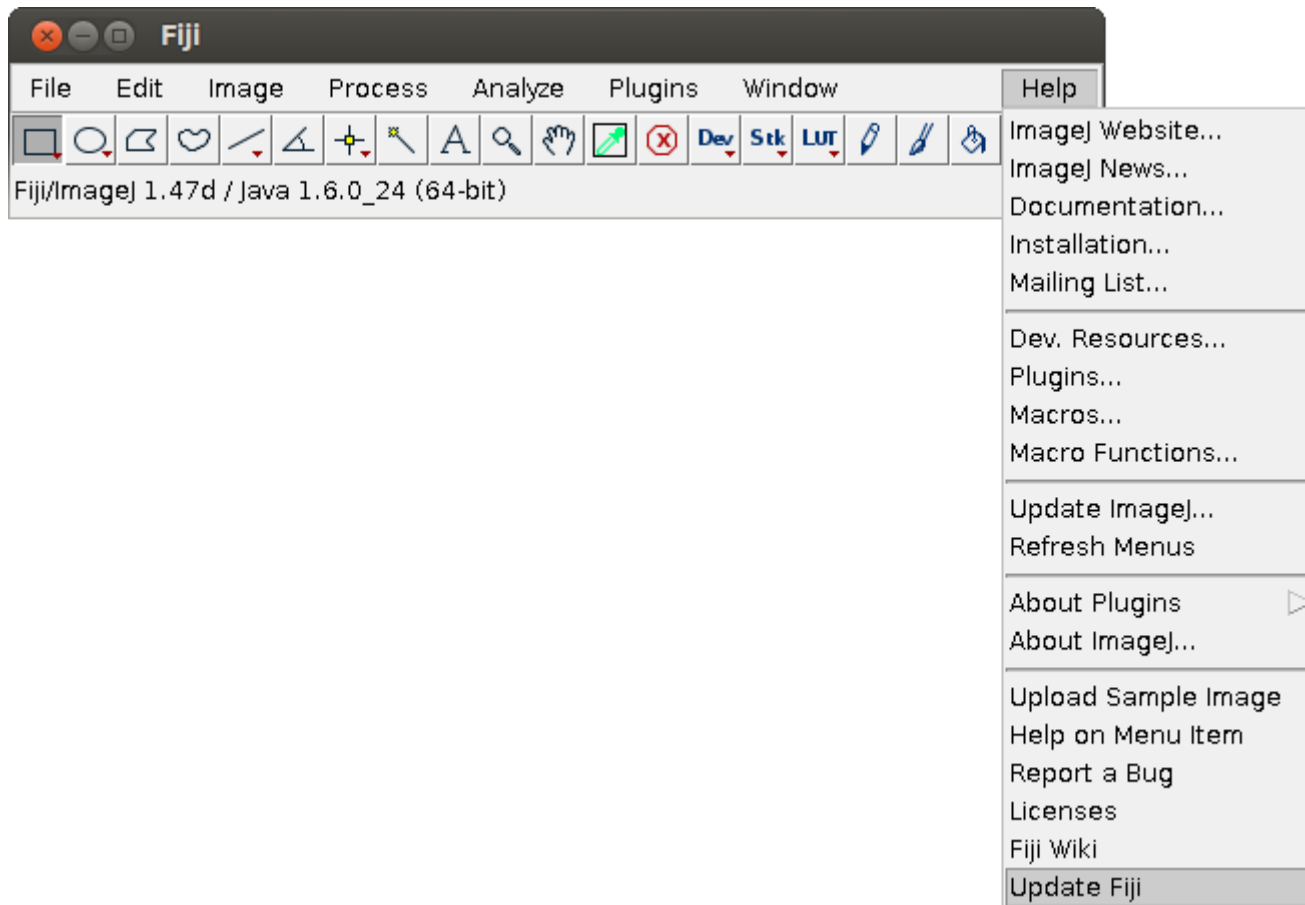
Collaboration

The Fiji project is driven by a strong desire to improve the tools available for life sciences to process and analyze data. To this end, Fiji collaborates closely with the following projects:

ImageJ2 [Bio-Formats](#) [OME](#) [µManager](#) [KNIME](#)

<http://fiji.sc/>

Staying up-to-date



http://fiji.sc/Fiji_Updater

Fiji's main window

Menubar

Tools

Status Bar

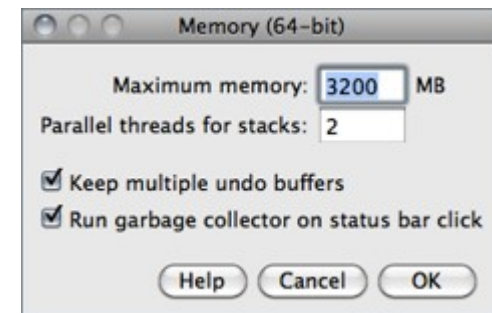


Tip: click on the status bar

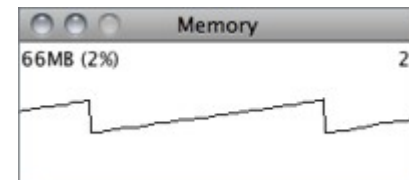
http://fiji.sc/Getting_started

Memory management

Edit>Options>Memory & Threads:



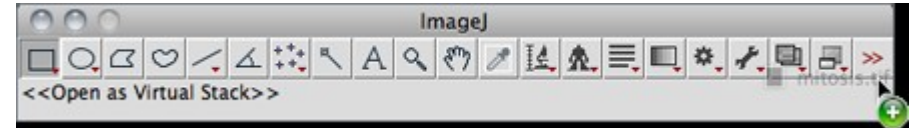
Plugins>Utilities>Monitor Memory:



<http://imagej.net/docs/guide/>

Opening images

Drag & Drop:



File>Open

File>Import>Bio-Formats

File>Import>Image Sequence...



Tip: virtual stacks

<http://imagej.net/docs/guide/>

Opening images

Exercise: download images from

<http://code.imagej.net/curtis/data/>

Saving images

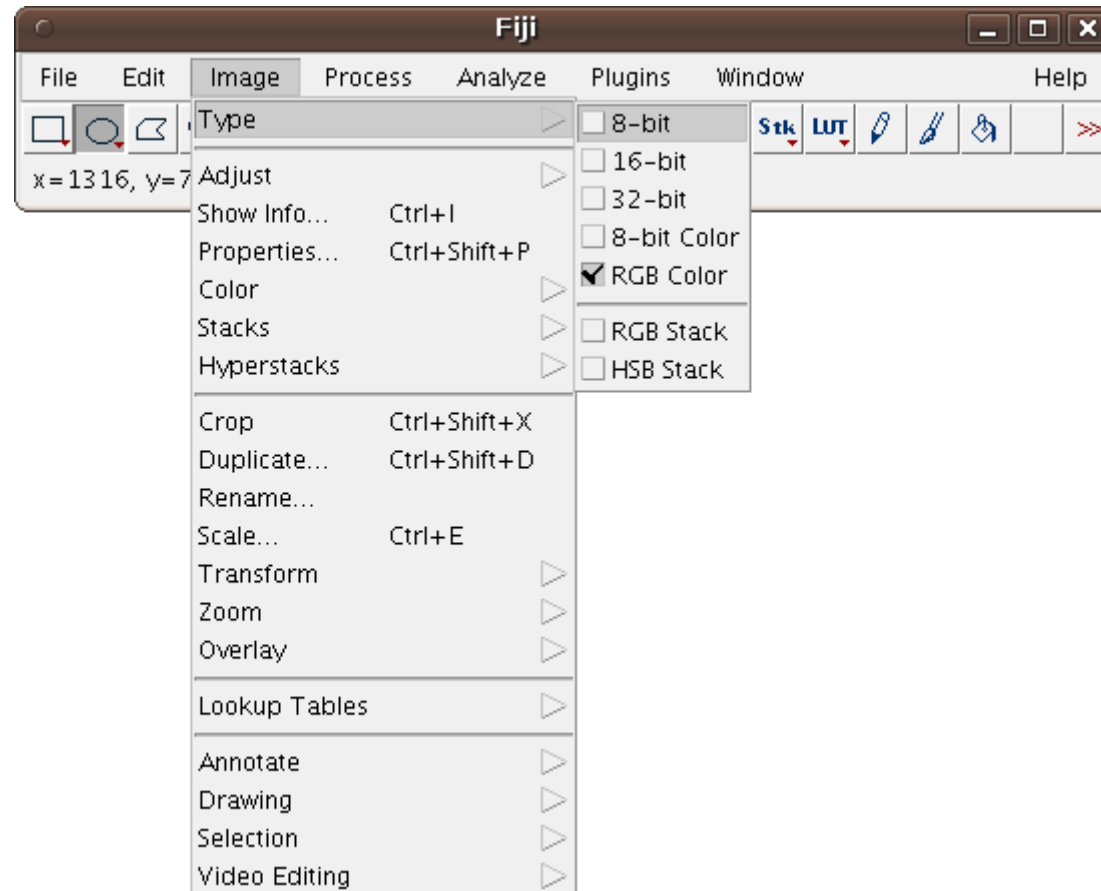
File>Save As

Plugins>LOCI>Bio-Formats Exporter



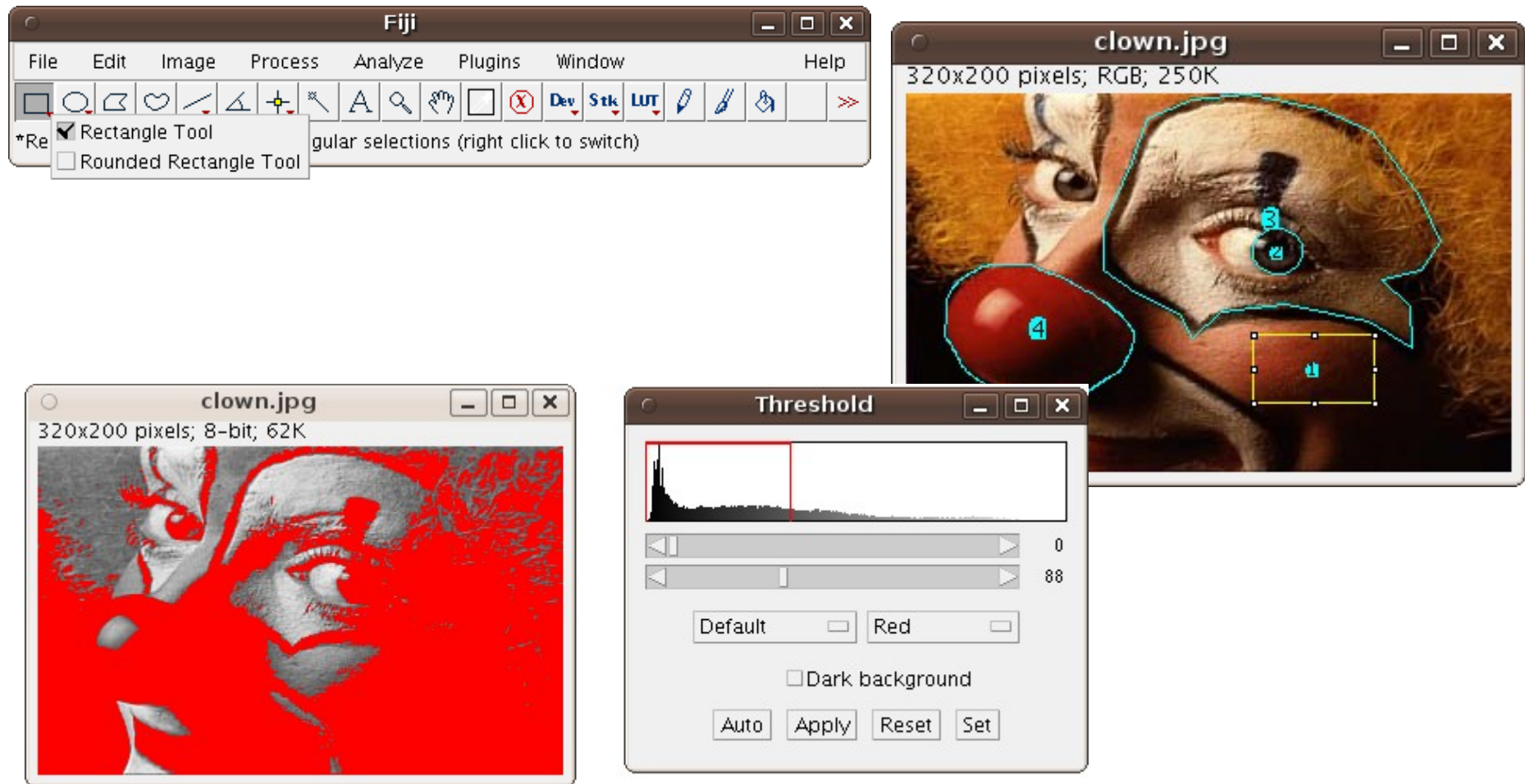
<http://imagej.net/docs/guide/>

Pixel types



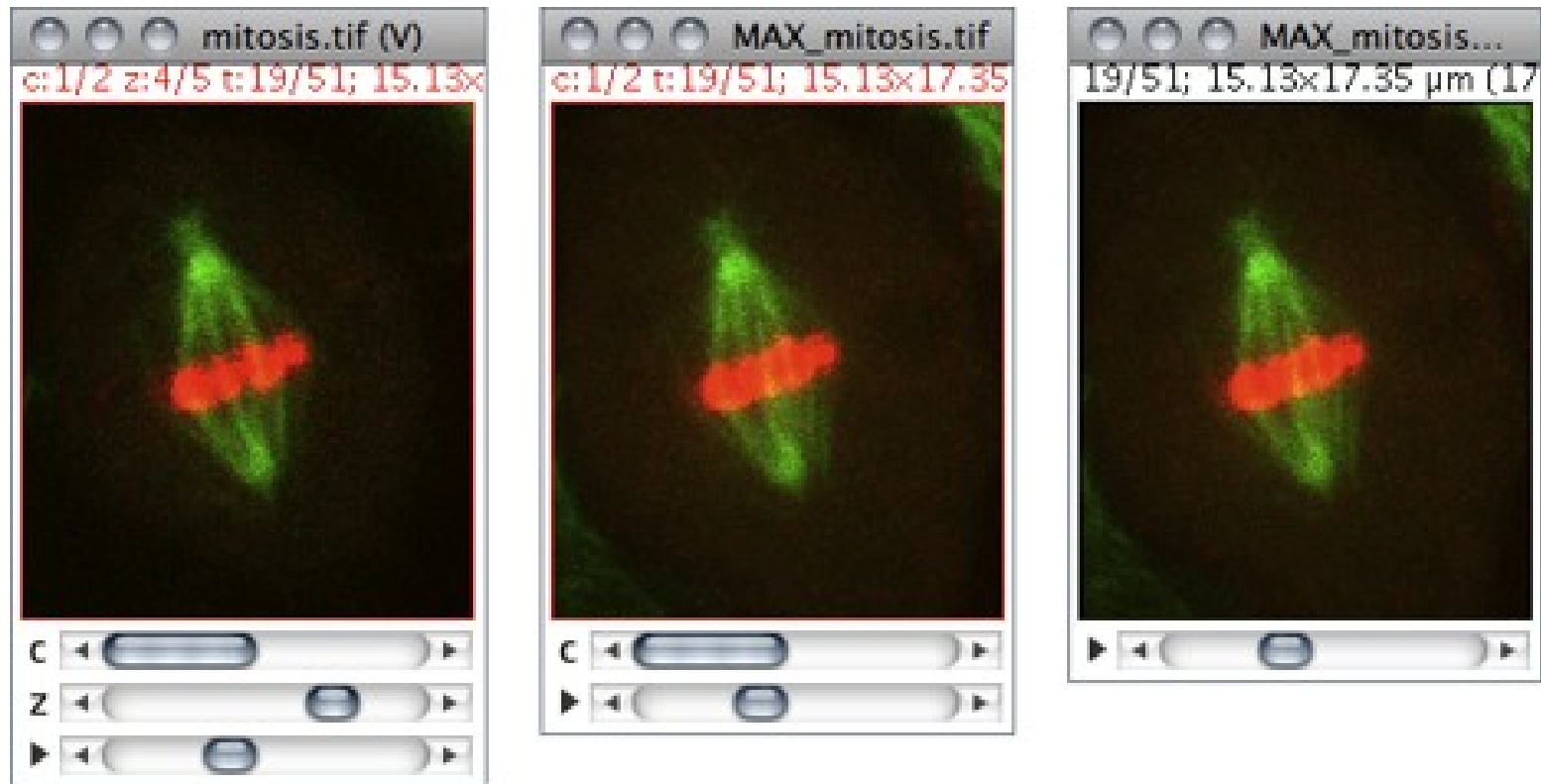
http://fiji.sc/Getting_started

Regions of interest: ROIs



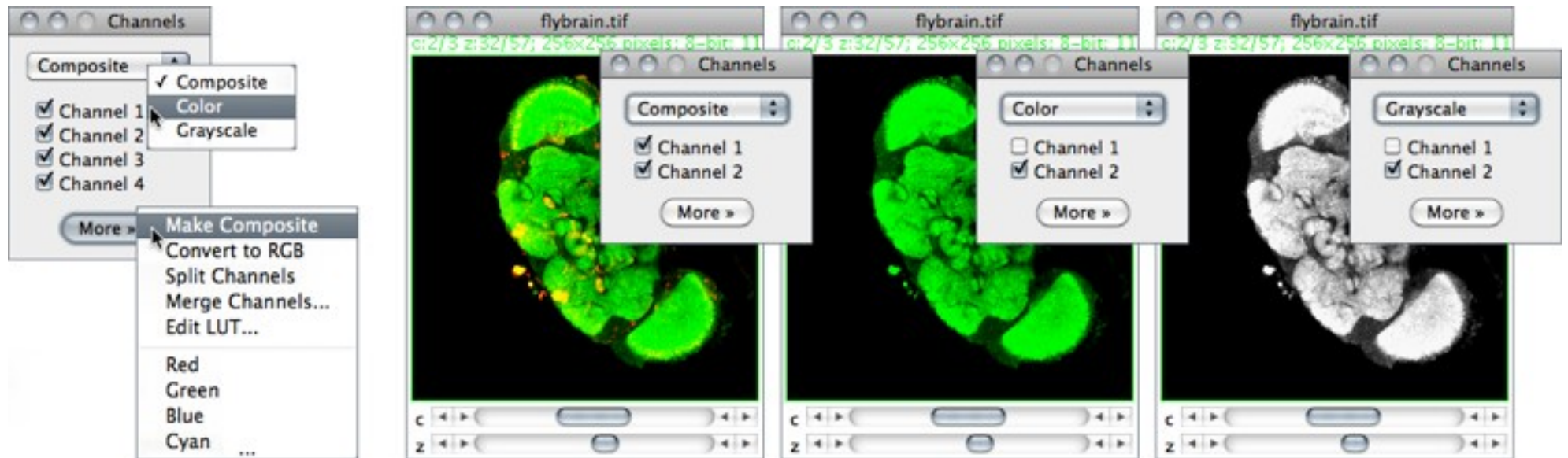
http://fiji.sc/Getting_started

Beyond 3D: Hyperstacks



<http://imagej.net/docs/guide/>

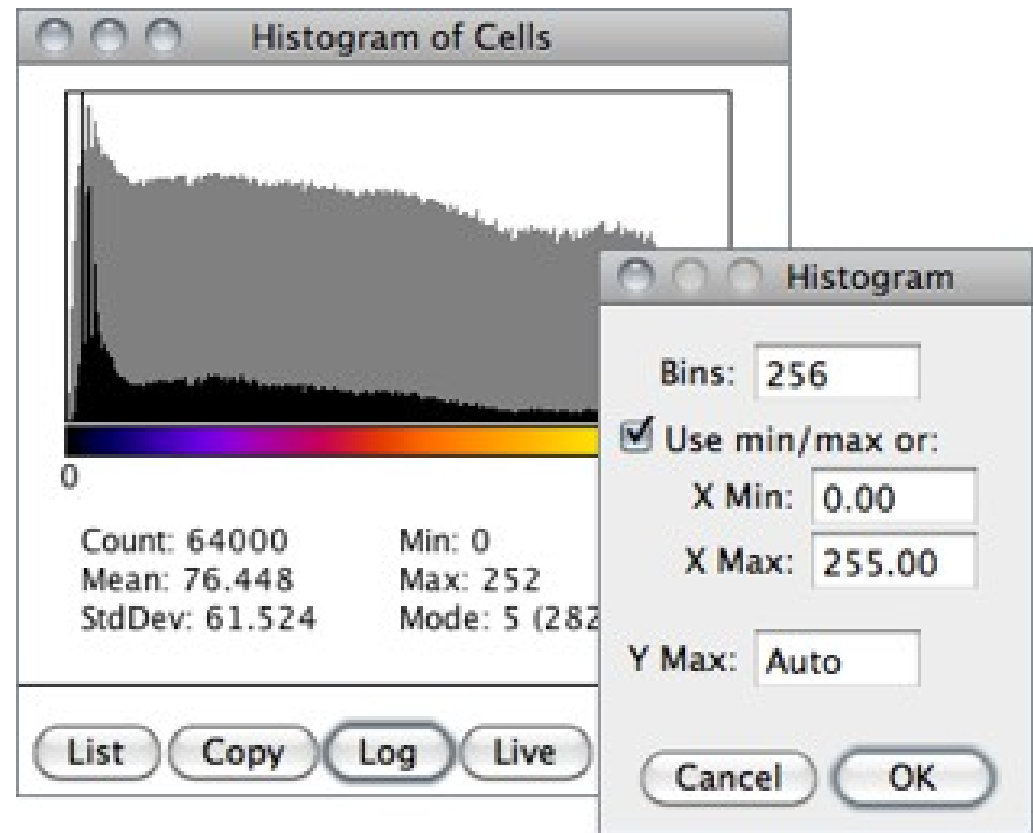
Color Modes



<http://imagej.net/docs/guide/>

Histogram

Analyze>Histogram

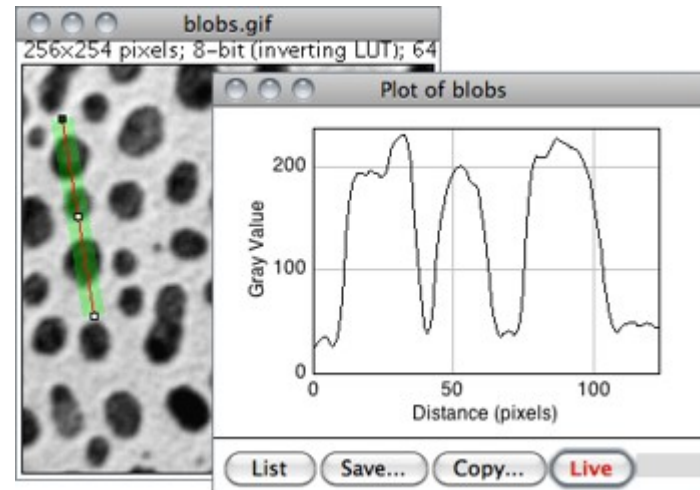


Exercise: What is wrong with
File>Open Samples>Blobs

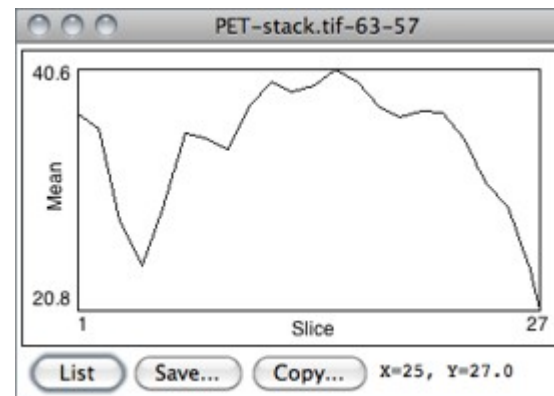
<http://imagej.net/docs/guide/>

Profile Plots

Analyze>Plot Profile

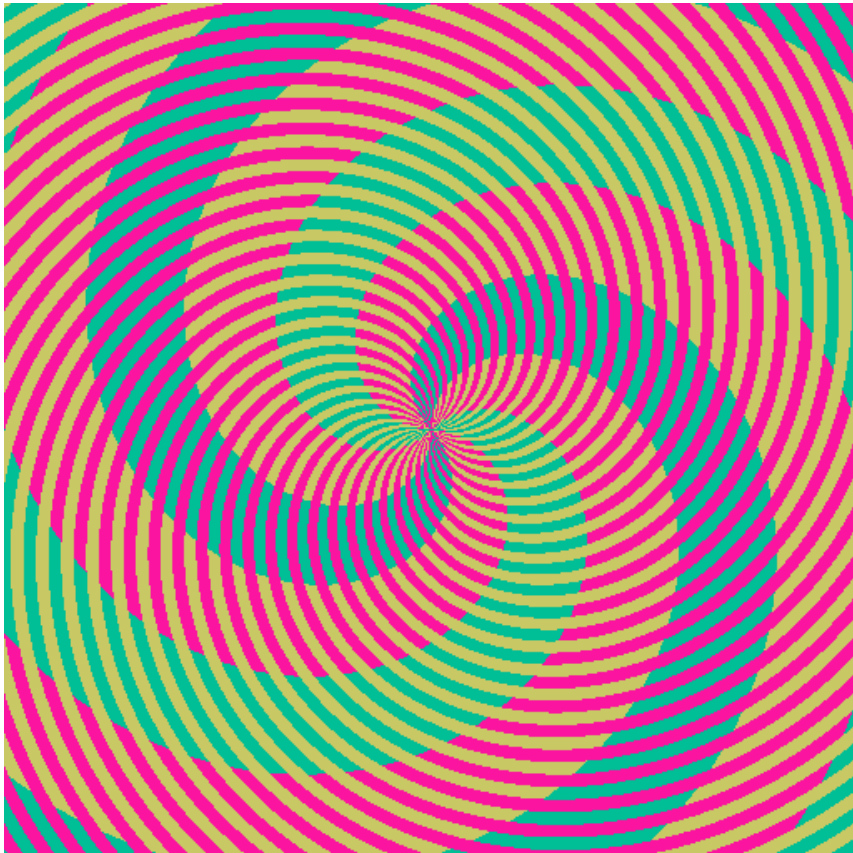


Image>Stacks>Plot Z-Axis Profile...



<http://imagej.net/docs/guide/>

Red/Green is not bright



Tip: *Image > Adjust > Brightness/Contrast...*

Pitfalls

- Quantitative = numbers,
qualitative = eyeballing it
- Don't trust color:
File>Open Samples>Spirals
- Don't trust intensity:
File>Open Samples>Adelsons Squares
- Don't trust lossy compression!
 - *Image>Lookup Tables>glasbey*
 - *File>Open Samples>Boats*
 - *File>Save As>JPEG*

http://fiji.sc/IP_Principles

Pitfalls

- Pixels are not little squares
 - See Alvy Ray Smith's article for details:
http://alvyray.com/Memos/CG/Microsoft/6_pixel.pdf
 - Can think of detectors as sampling a Gaussian (approximately)
 - *Edit>Options>Appearance*



http://fiji.sc/IP_Principles

Pitfalls

- Math with ints and floats has limitations
 - *File>New>Image...* (float, ramp)
 - Multiply by 10,000,000
 - Add 1
 - Probe values;
Do you see what is wrong now?

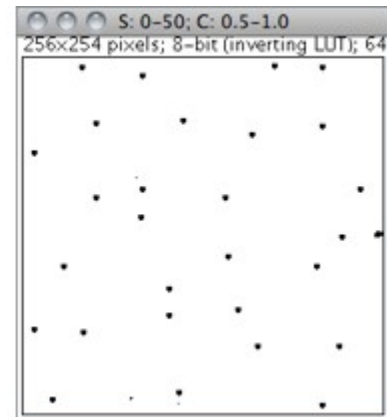
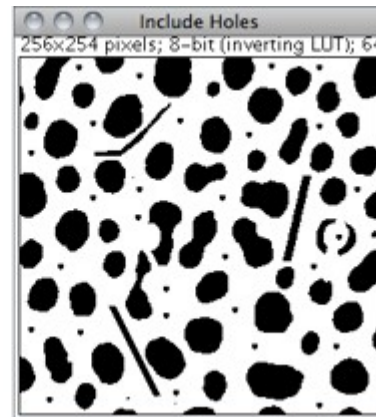
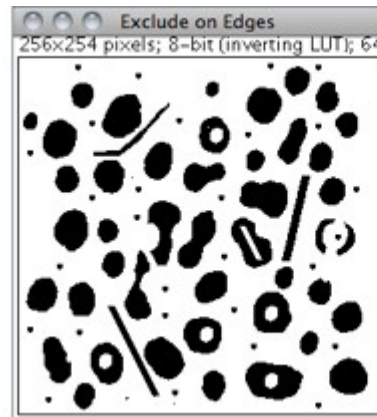
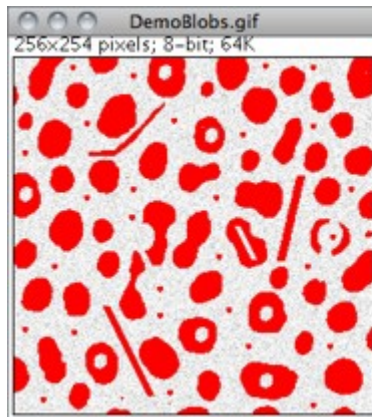
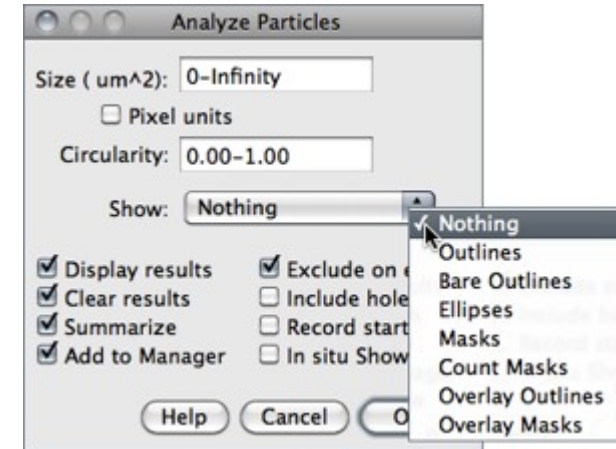
http://fiji.sc/IP_Principles

3D Viewer



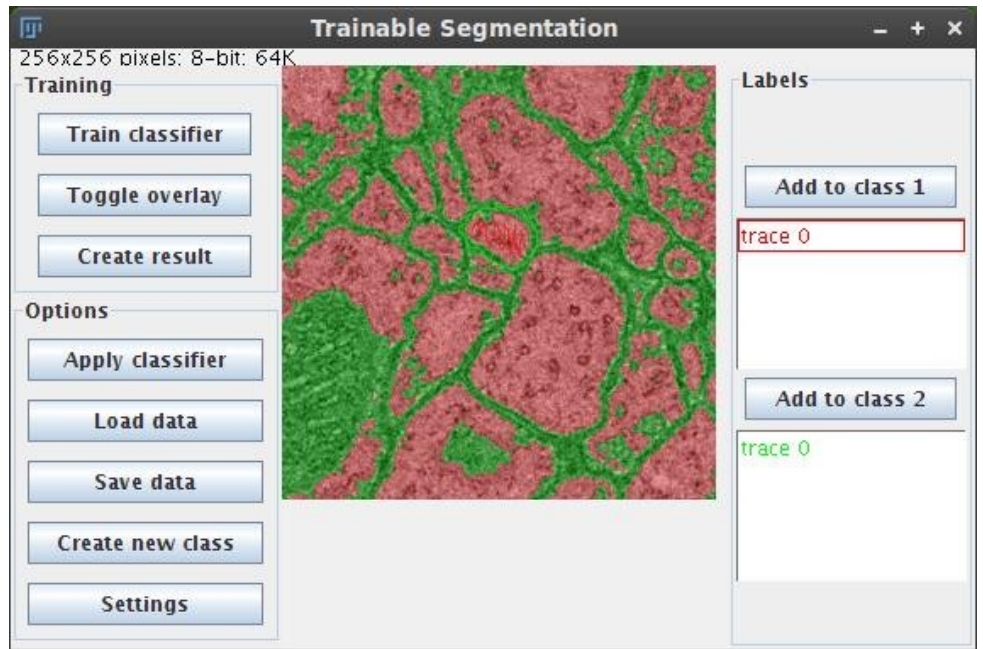
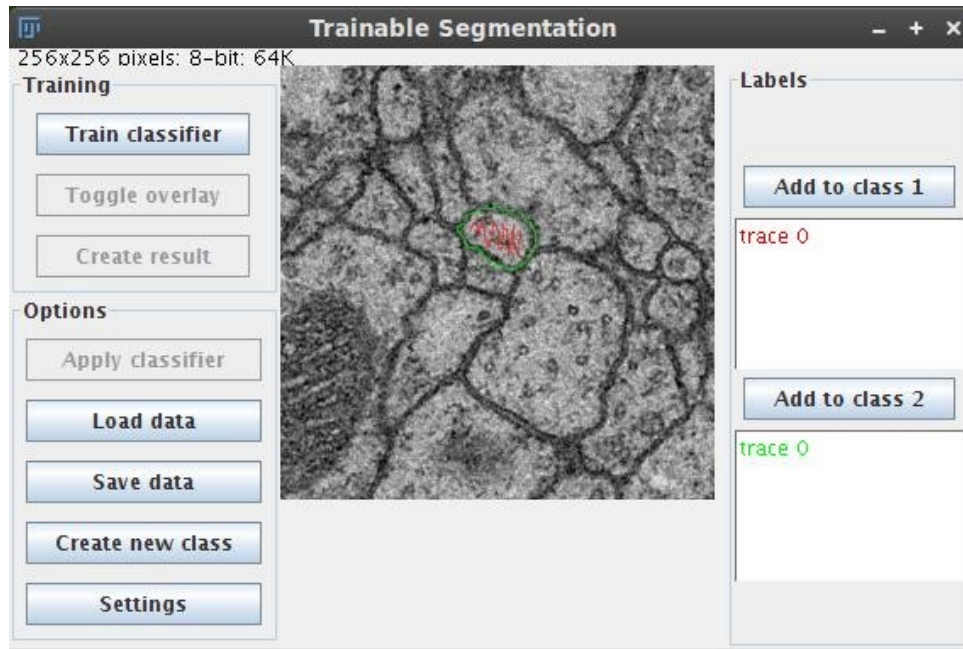
http://fiji.sc/3D_Viewer

Segmentation



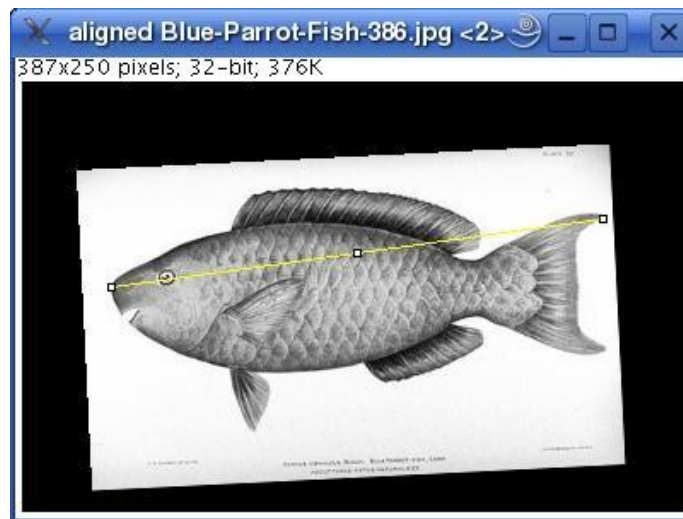
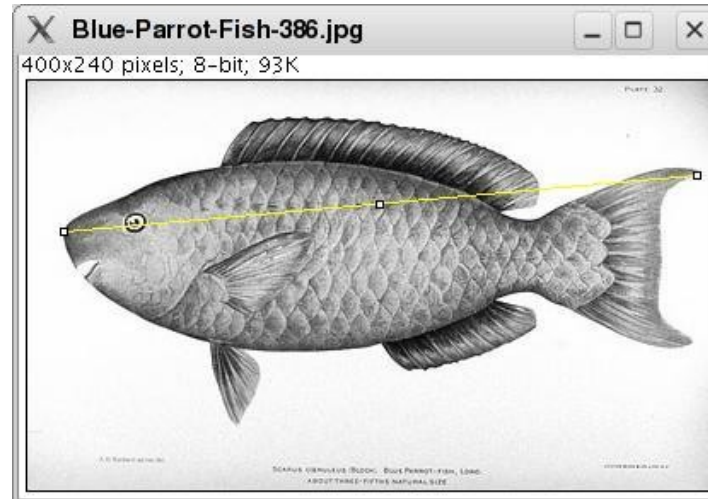
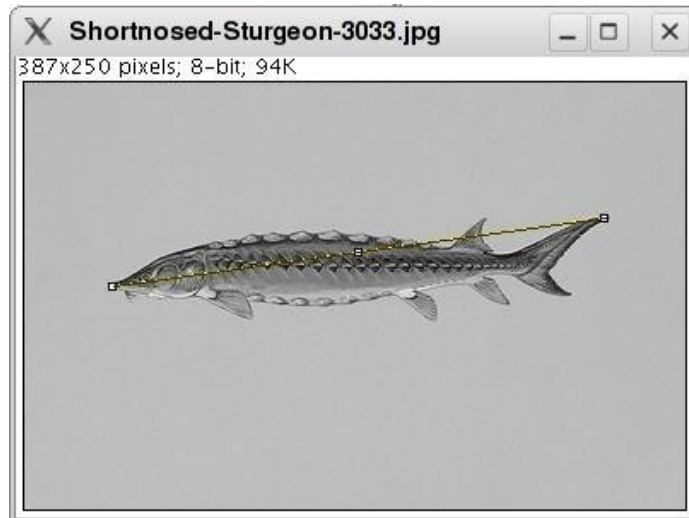
<http://imagej.net/docs/guide/>

Segmentation



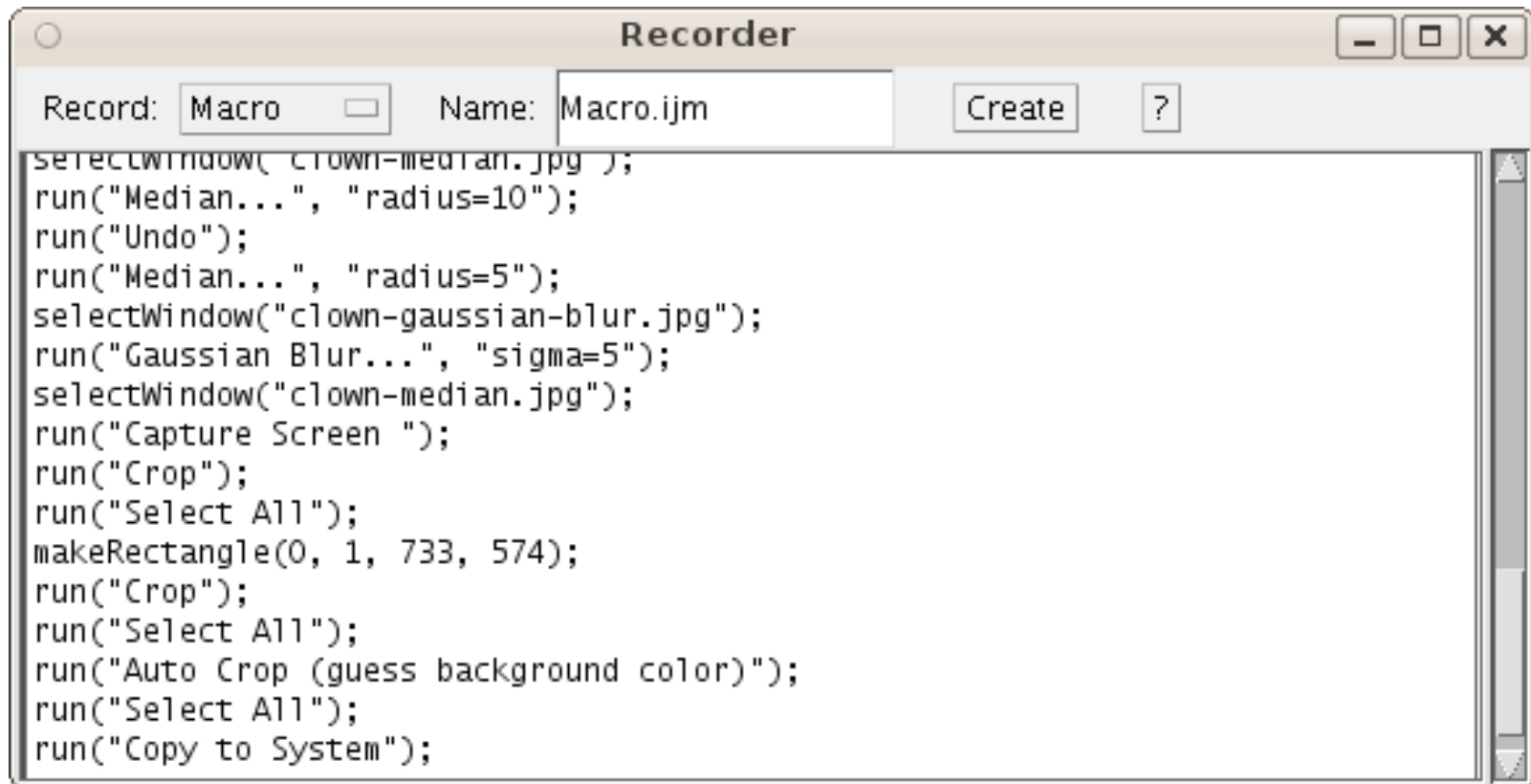
http://fiji.sc/Trainable_Segmentation

Registration



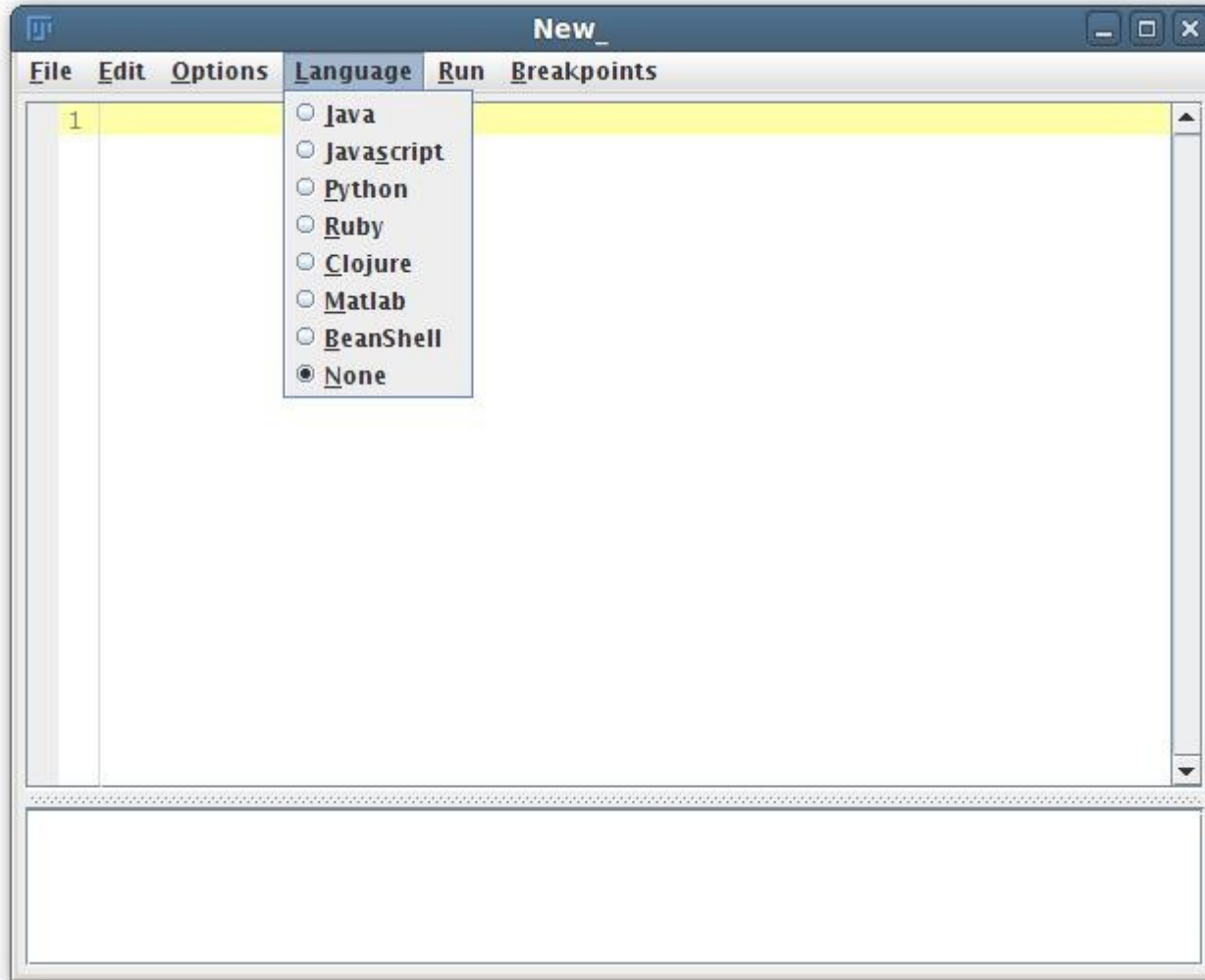
http://fiji.sc/Align_Image_by_line_ROI

Macros



http://fiji.sc/Macros_Intro

Macros



- Functions
- String manipulation
- Variables
- Comments
- Conditionals
- Loops

http://fiji.sc/Script_Editor

Further reading

Thorough guide for beginners:

<http://nic.uni-hd.de/>

Thorough, up-to-date manual on ImageJ:

<http://imagej.net/docs/guide/>

MBF ImageJ: ImageJ for Microscopy Manual:

<http://www.macbiophotonics.ca/imagej/>

ImageJ mailing list! 2000+ members

<http://imagej.net/list.html>