Image j/Fiji for beginners

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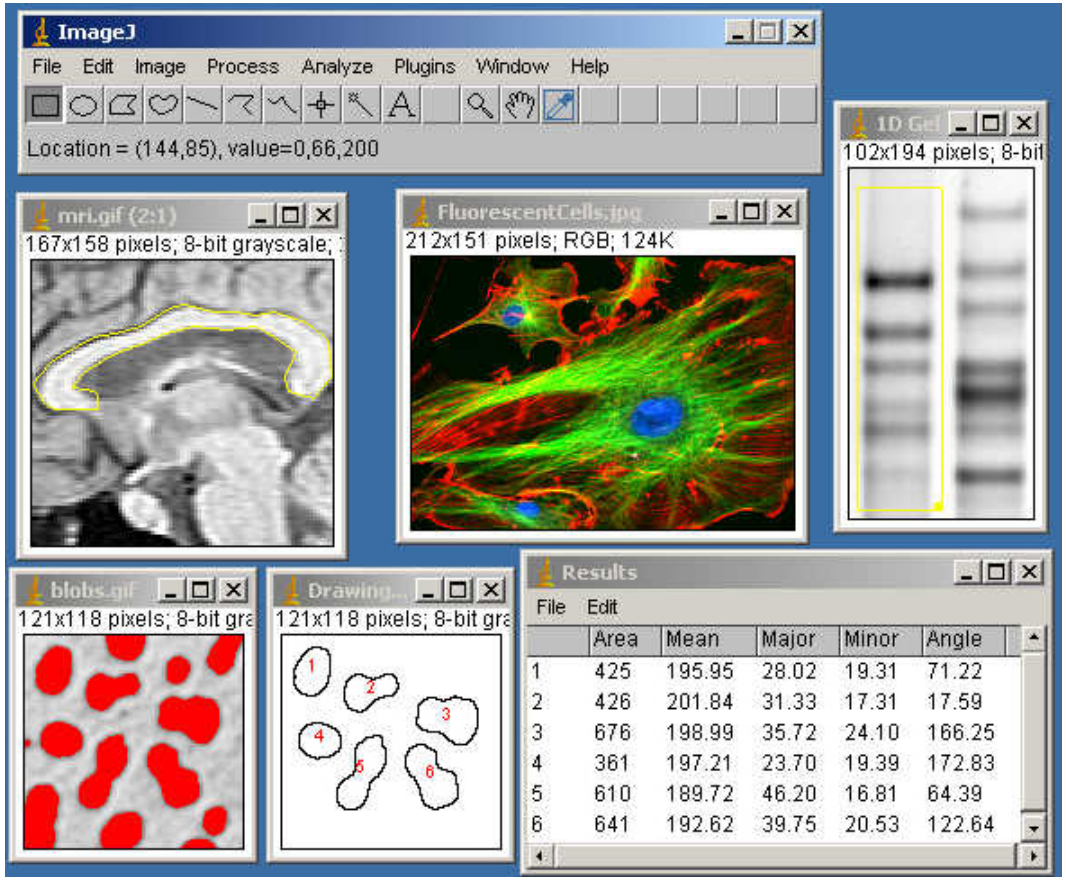
cnrs dépasser les frontières

Inserm

Aix*Marseille université

Plan

- Introduction
- Help menu
- Task bar
- File menu
- Image menu
- Process menu
- Analyse menu
- Plugins menu



Introduction

Technology

- Fiji is Image J with plugins inside
- It is actually based on java 8
- Fiji integrate the new Image J2 which have better functionalities (plugins update, script editor, better reading and writing image format)
- Plugins or macro should be downloaded in the plugin directory of Fiji
- Lot of information here :

https://imagej.nih.gov/ij/docs/guide/146-29.html

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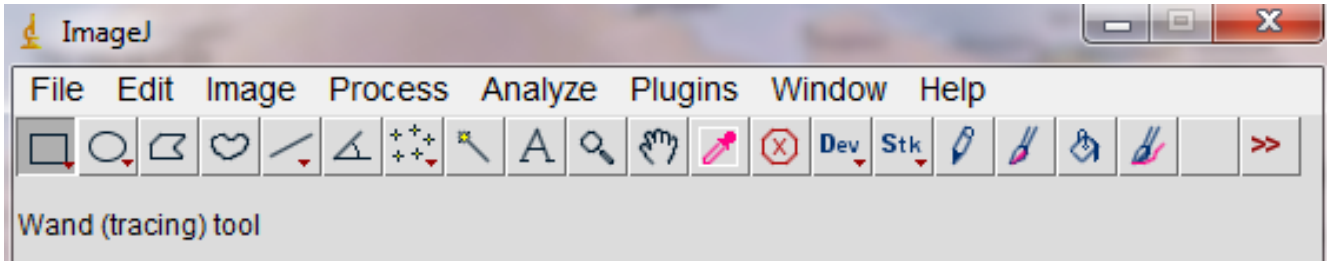
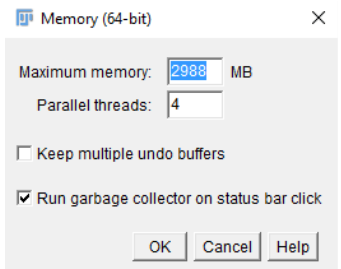
Help menu : to begin

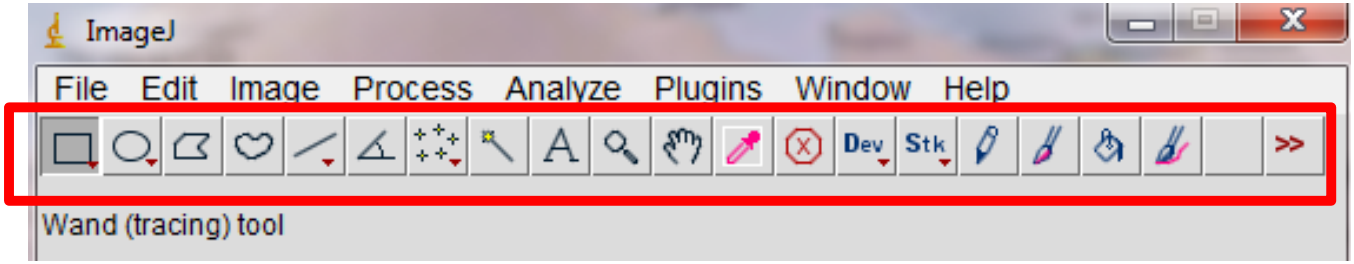


- Documentation : Help/Documentation
- Plugins: Help/Plugins
- Update : Help/update Image J and update Fiji

- Use Ctrl l to search function
- Options : Edit/Options/Memory and Threads and Image J2



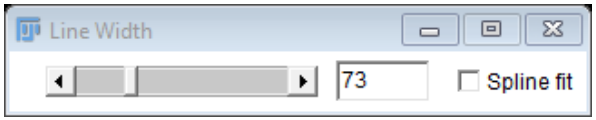
Taskbar



To see the option double clic or clic right

- Shape : to define region and crop

- Line : to draw line



- Points : to count

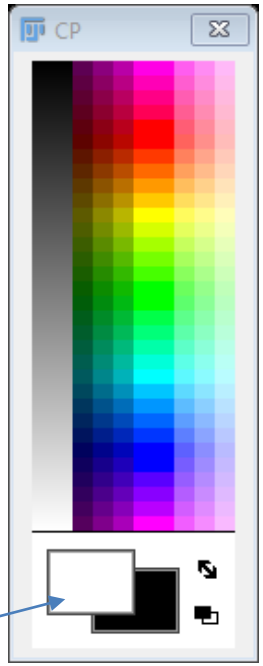
- Magic Wand : to define object

- Annotation : to draw annotation (ctrl D to draw it)

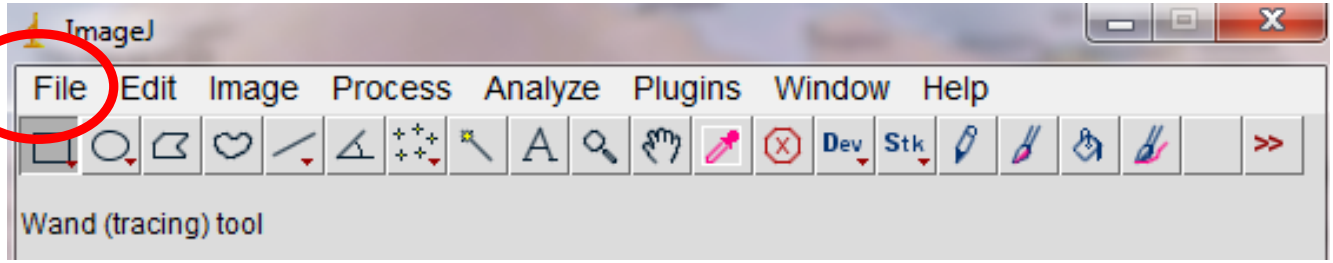
- Loop and hand

- Color Picker : to define foreground and background color

- Menu

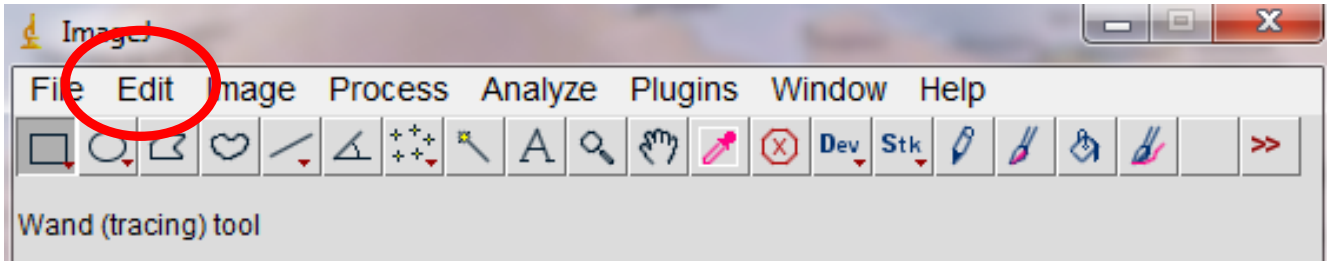


File menu



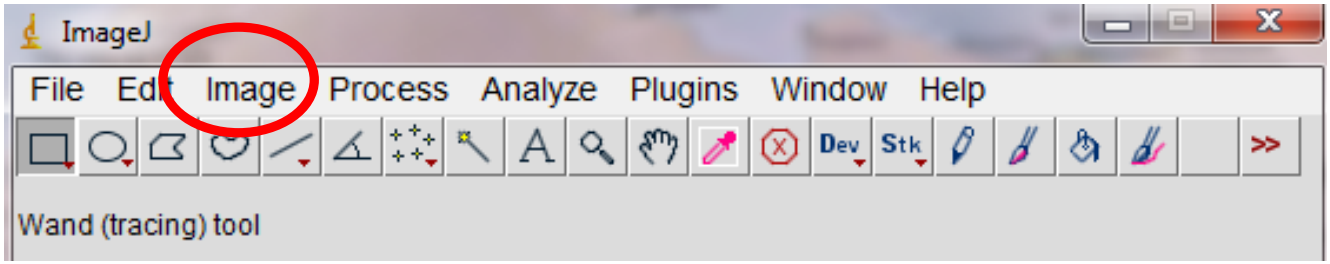
- Drag and drop your images in the taskbar
- Import multiple TIFF : File/Import/Image sequence
- Plugin Bio-formats
- Save As (avi…) no compression use VirtualDub to compress in mpeg4
- Make a new image : File/New Image
- Revert : File/Revert
- Open : File/Open Samples, Open recent

Edit menu

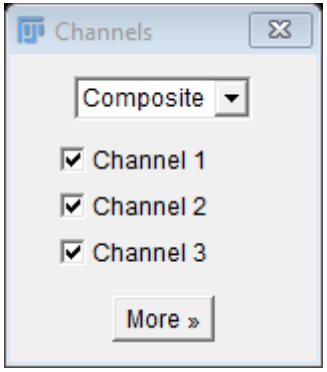


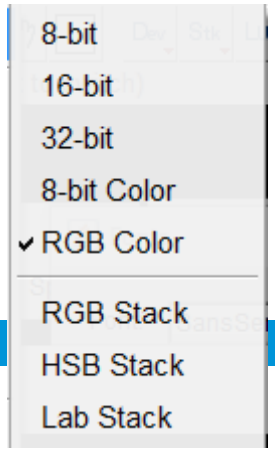
- Fill a space : Edit/Fill (ctrl D)
- Draw a text : Edit/Draw (ctrl F)
- Clear : Edit/Clear and Clear outside
- Make selection : Edit/Selection/Select all or none or restore selection or Create Selection (on binary mask) or Specify (to crop on specfied number of pixel)
- Options : Edit/Options/Memory and Threads and Image J2
- Invert : Edit/invert

Image menu

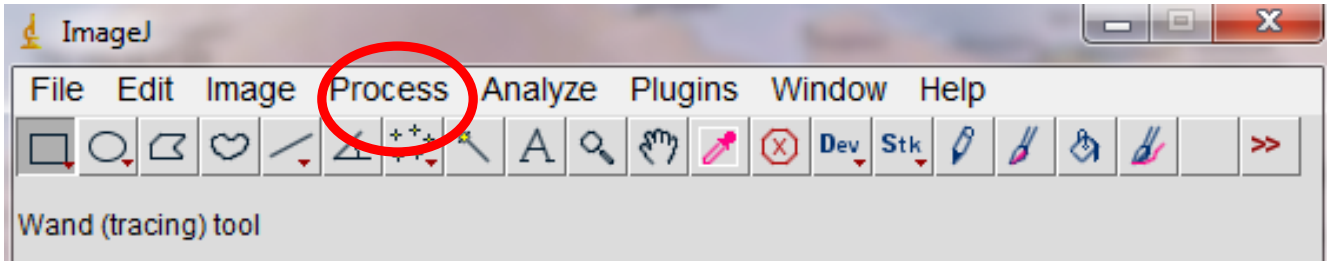


- Check calibration : Image/show Info and properties
- Handle colors channels : Image/colors/channel tool, image/color/split channels
- Change LUT : Image/lookup Tables
- Change contrast : Image/adjust/Brightness&contrast or image/adjust/color balance
- Change type images : Image/type
- Handle stack images : Image/stacks/tools
- Crop : Image/Crop

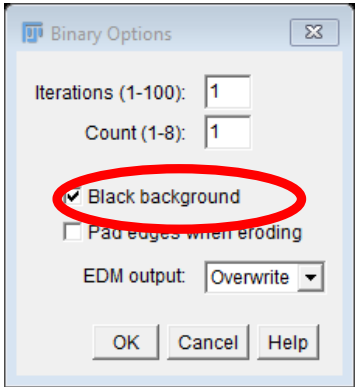


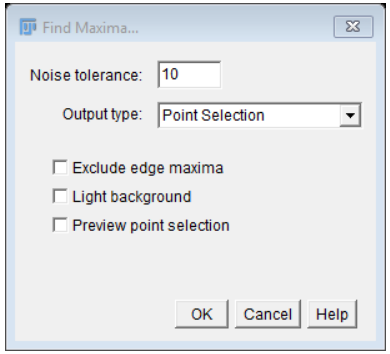


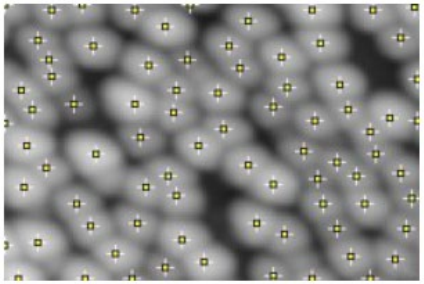
Process menu



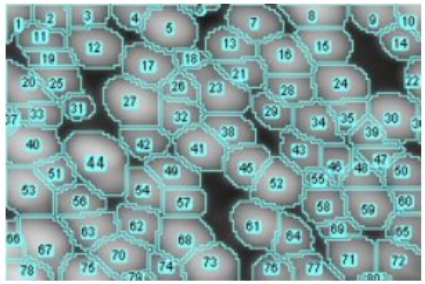
- Median filters : Process/Filters/median
- Morphology filters : Process/binary (options)
- FFT : Process/FFT (Bandpass Filter, FD math)
- Find spot : Process/Find Maxima







Points at maxima (Multi-point selection)



Segmented Particles (ROIs obtained with Analyze▹Analyze Particles…↓)

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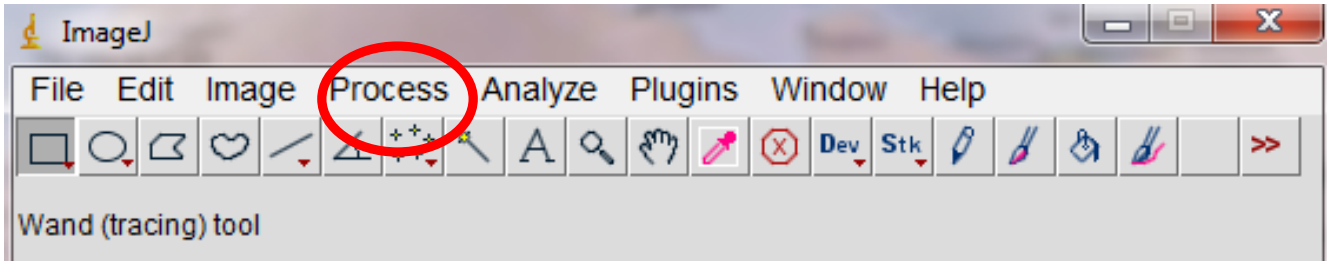
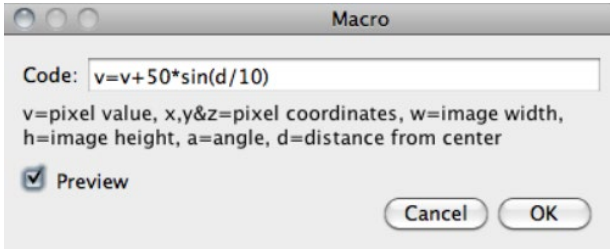
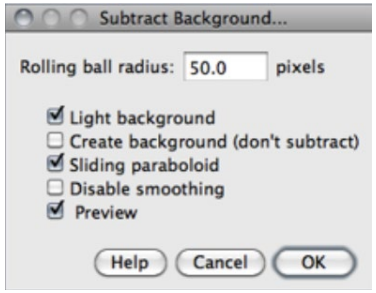
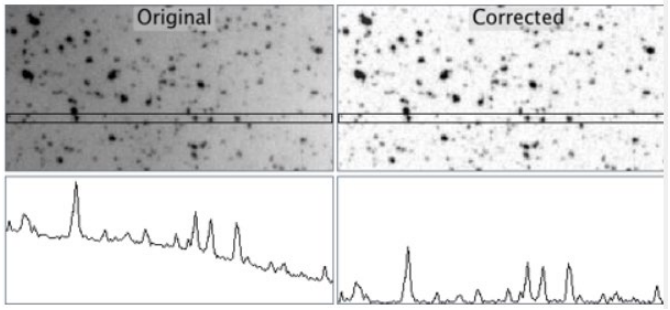
Process menu



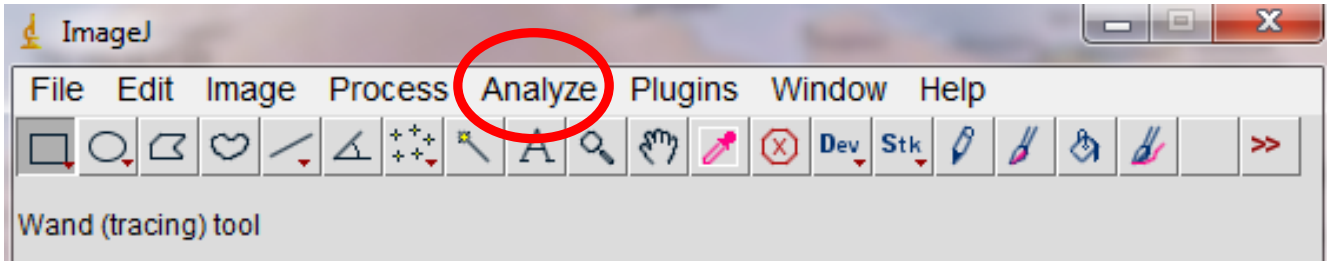
- Mathematical operation : Process/Math
- Operation between images : Process/Image calculator
- Substract background : Process/Substract background

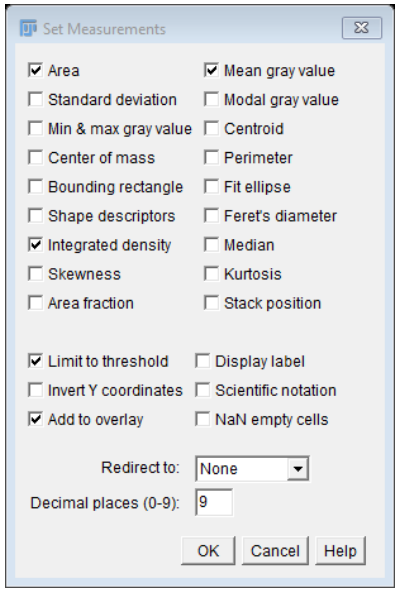




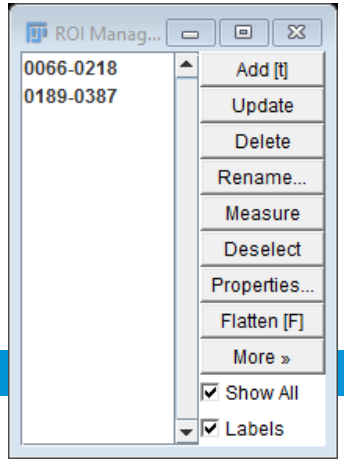


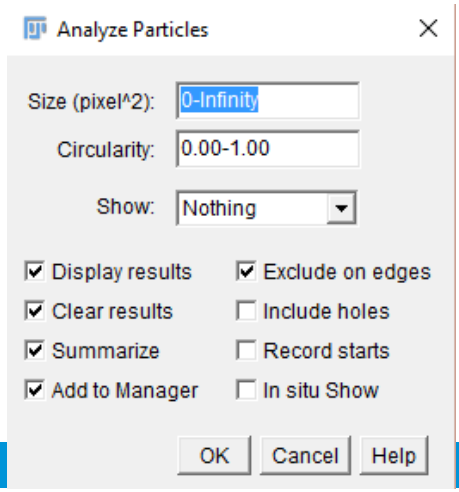
Analyse menu



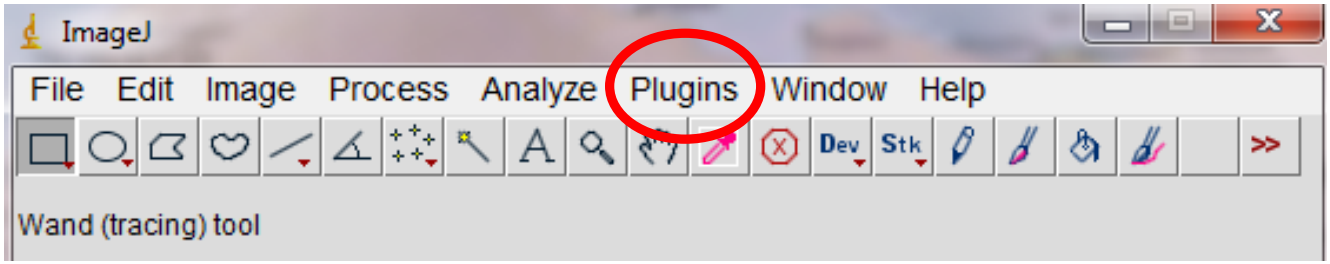


- Measure : Analyse/measure and set measurements
- Analyse : Analyse/Analyse particles…
- Histogram : Analyse/Histogram
- Profile : Analyse/Plot Profile
- Tools : Analyse/tools/Scale bar and ROI manager

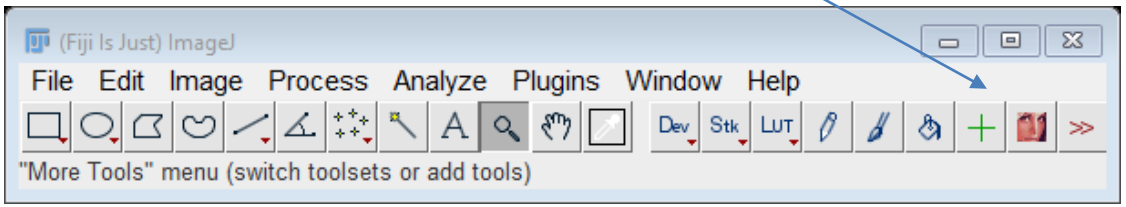




Plugin and macro



- Macro : Plugins/Macros/Record…
- Shortcut : Plugin/Shortcut
- Control panel : Plugin/Utilities/Control panel…
- List of plugins: try Jacop for colocalisation
- Possibility to add icon on the taskbar



Shortcut

Technology

Interesting shortcuts: ctrl

a	Select All
A	Select None
b	Add Selection...
C	Brightness/Contrast...
c	Copy
d	Draw
D	Duplicate...
E	Restore Selection
e	Scale...
f	Fill
F	Flatten
G	Capture Screen
h	Histogram
H	Orthogonal Views
I	Invert
i	Show Info...
K	Color Picker...
k	Plot Profile
l	Find Commands...
M	Install...
m	Measure
N	Text Window
o	Open...
P	Properties...
r	Revert
R	Repeat last command
s	Save
S	Smooth
t	Add to Manager
T	Threshold...
U	Control Panel...
v	Paste
V	System Clipboard
w	Close
X	Crop
x	Cut
Z	Channels Tool...
z	Undo

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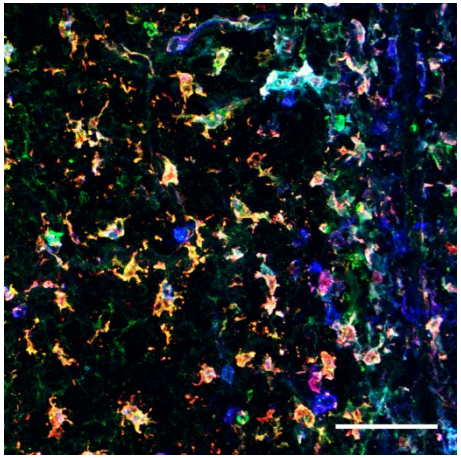
Practice

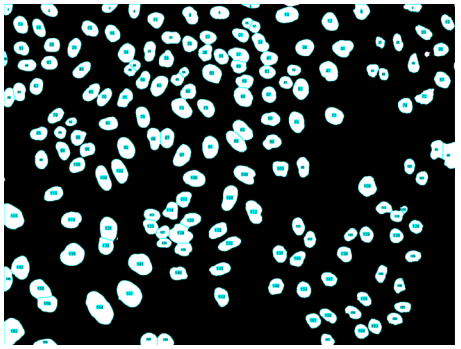
Technology

Open the image “Thymus” :



- Change the contrast channels
- Change the LUT of the blue channels in cyan
- Make the Z projection, make a median filter
- Draw a scale, check the calibration

Open the image Noyaux :



- Split the channel
- Make the threshold on the blue channel and create the binary mask
- Do the segmentation and count the objects
- Do a macro recording the different steps

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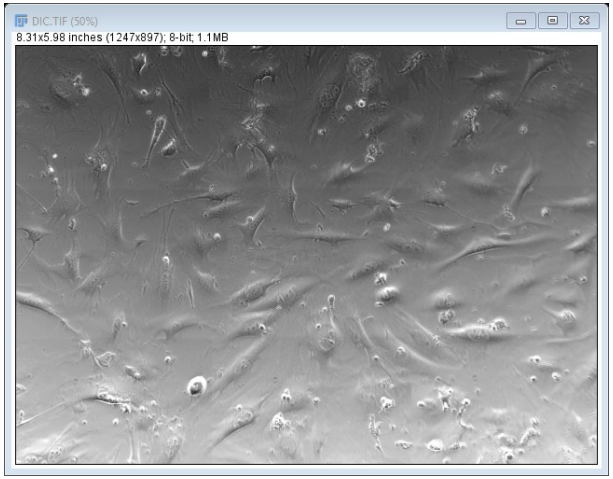
Practice

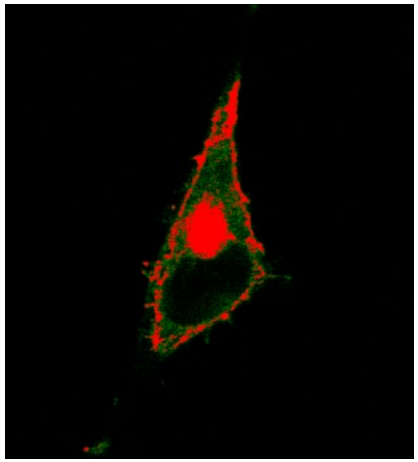
Technology

Open the image DICand correct the background by creating a shading image.



Open the image EV2NK and apply a median filter. Calculate the Pearson coefficient with and without median filter.

Open the image ABCA1 and quantify the membrane staining. How to do it ?



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