



Topic 01 - Installation, configuration, help and updates

Solution 1.1: Installation

Go to the ImageJ website at <http://imagej.nih.gov/ij/>.



Figure 1: The ImageJ website <http://imagej.nih.gov/ij/>

Click on Download.

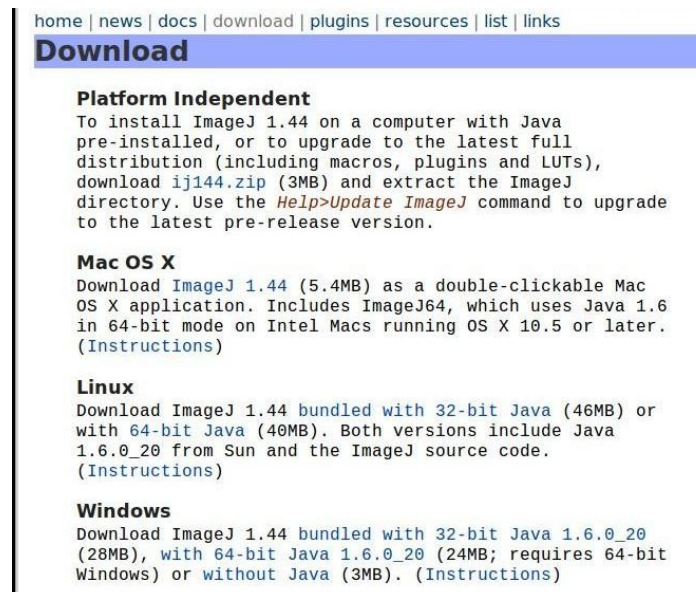


Illustration 2: The ImageJ download page. Select the version for your system including the right java version, 32 or 64 bit.

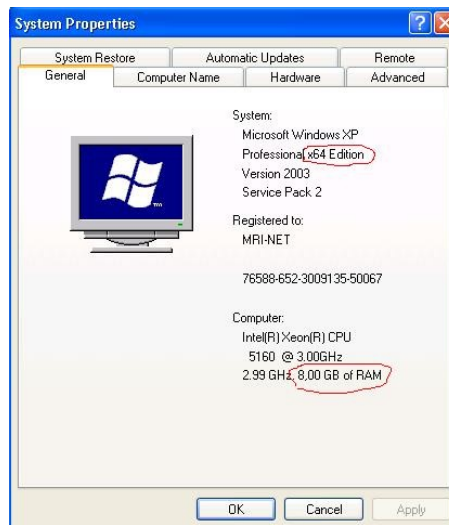


Figure 3: The system is 64bit and has 8GB of memory.

Look at the properties of My Computer in the windows explorer, to find out if your system is 64bit and how much memory it has. Download the ImageJ version for your system with the appropriate java included (32 or 64bit). Run the setup and answer the questions. At the end ImageJ will be started for the first time.

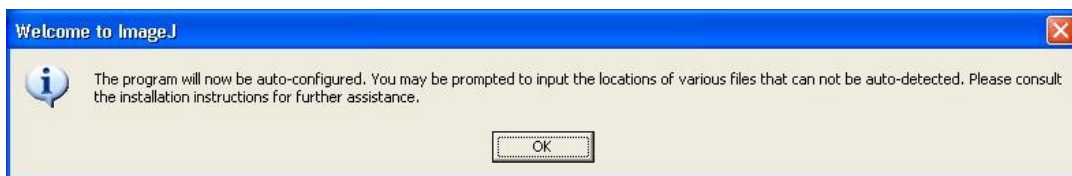


Figure 4: The first time ImageJ is started it auto-configures the thread and memory settings.



Figure 5: The configuration is written into the file ImageJ.cfg.

Now the ImageJ-launcher window will be displayed.



Figure 6: The ImageJ launcher window.

Solution 1.2: Memory-Configuration

Look at the system properties how much memory your machine has, then enter $\frac{3}{4}$ of it in the memory options:

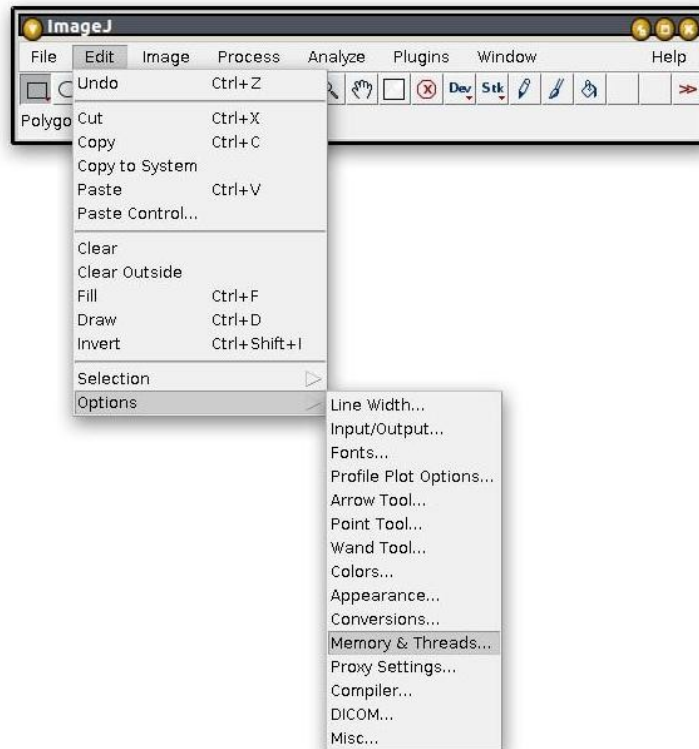


Figure 7: Run Edit>Options>Memory & Threads...

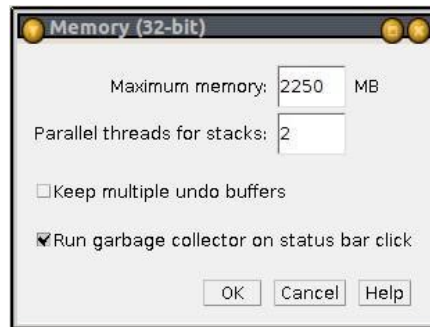


Figure 8: The memory and threads settings. The machine has 3GB RAM and two cores.

If for example your machine has 3GB memory, you should enter $\frac{3}{4} * 3000\text{MB} = 2250\text{MB}$.

The content of the file ImageJ.cfg in the ImageJ base folder is:

```
.  
jre\bin\javaw.exe  
-Xmx2250m -cp ij.jar ij.ImageJ
```

Solution 1.3: Update

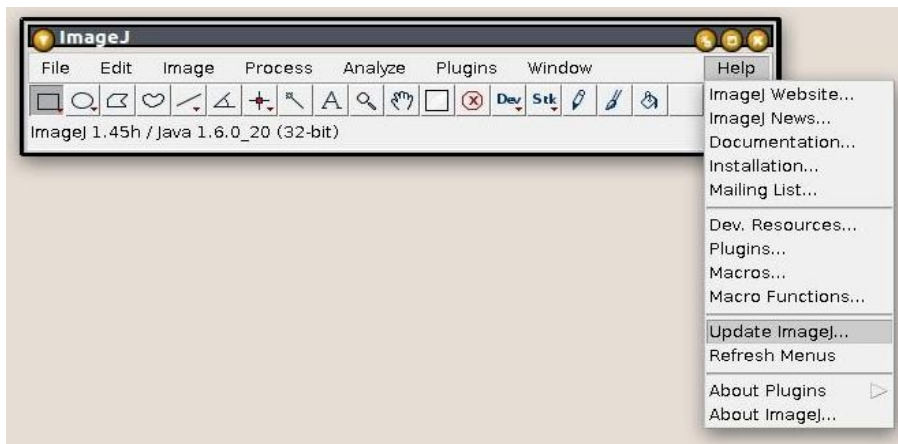


Figure 9: The Help>Update ImageJ menu.



Figure 10: You can either choose the current version, an older version or the daily build.



Figure 11: The about-dialog shows the version information.

Solution 1.4: ImageJ folders



Figure 12: The content of the ImageJ base folder.



a)

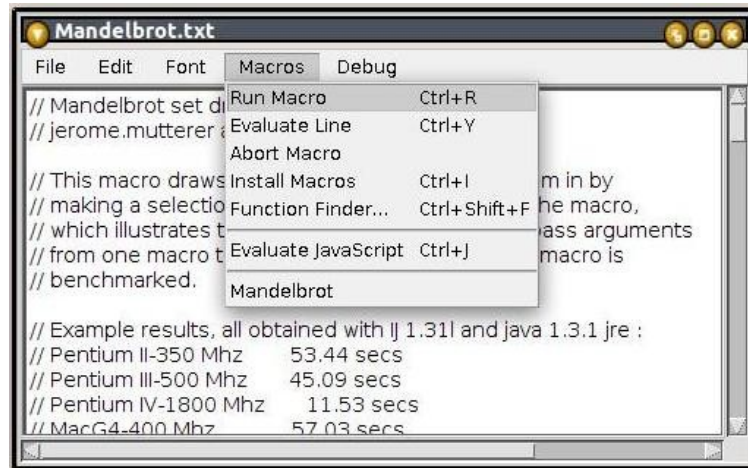


Figure 13: Running a macro from the macro-editor.

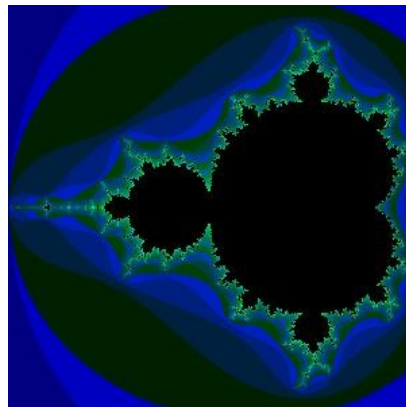


Figure 14: The result of running the Mandelbrot-Macro.

b)

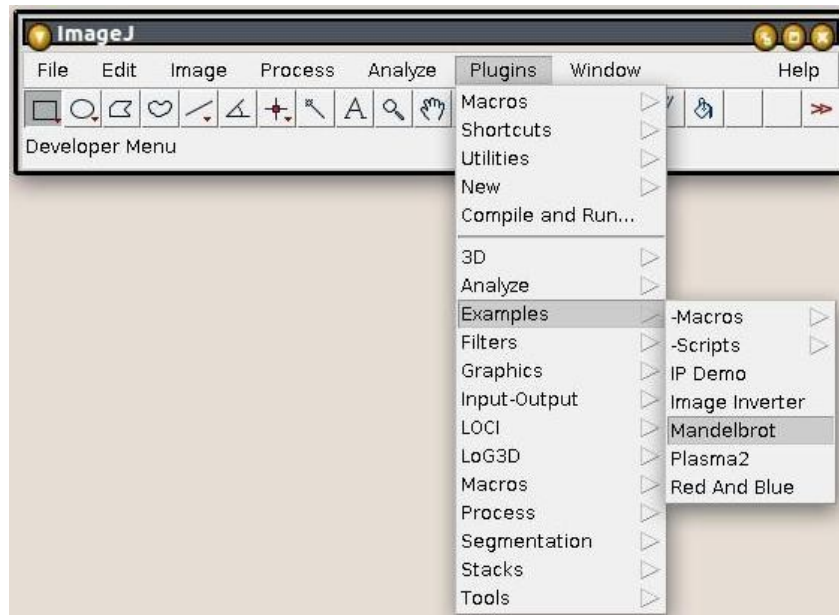


Figure 15: The Mandelbrot command appears in the Plugins menu.

- c) Instead of running the macro, the text file is opened in the macro-editor.

Solution 1.5: Opening images

- a)

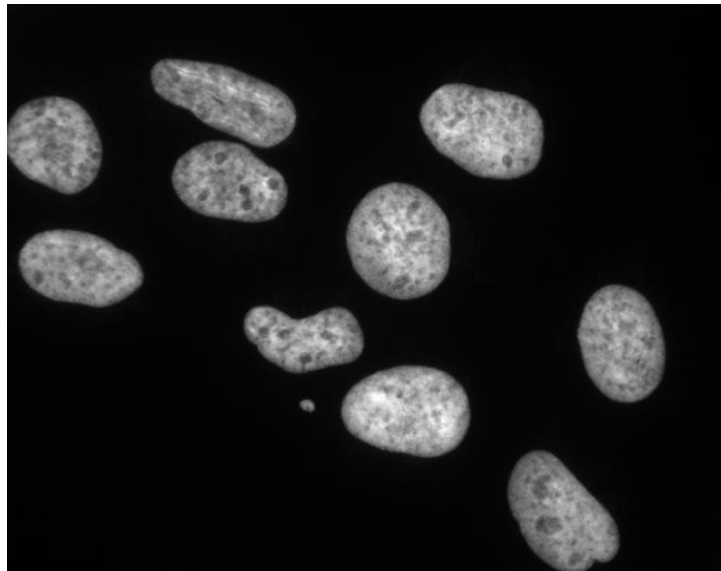


Figure 16: The image A4 dapi1.tif.

- b)

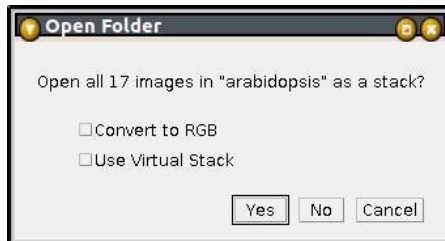


Figure 17: The open folder dialog.



Figure 18: The image-stack created from the images in the Arabidopsis folder.

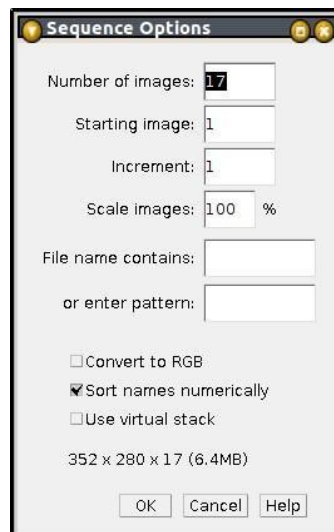


Figure 19: A dialog that allows to import image-sequences.

c)



Figure 20: The image opened in ImageJ by dragging the link onto the launcher window.

- d) The second time ImageJ adds -1 to the name to avoid confusion. For example opening the Image *A4 dapi 1.tif* twice, results in one image with the title *A4 dapi 1.tif* and another one with the title *A4 dapi 1-1.tif*.

e)

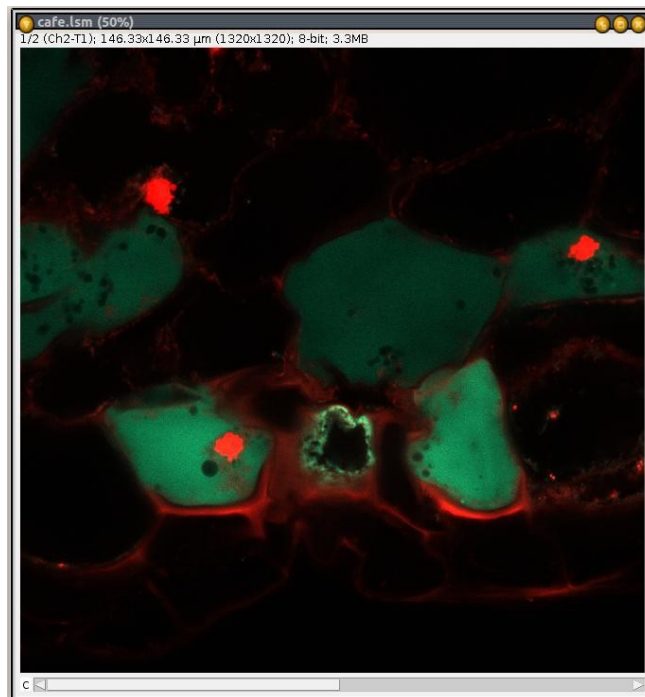


Figure 21: The image *cafe.lsm* displayed in composite-mode.

f)

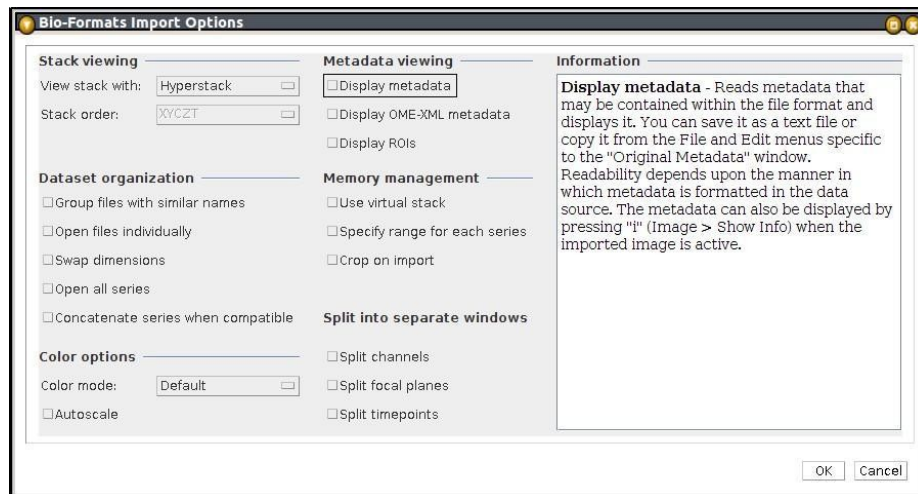


Figure 22: The Bio-Formats Import Options.

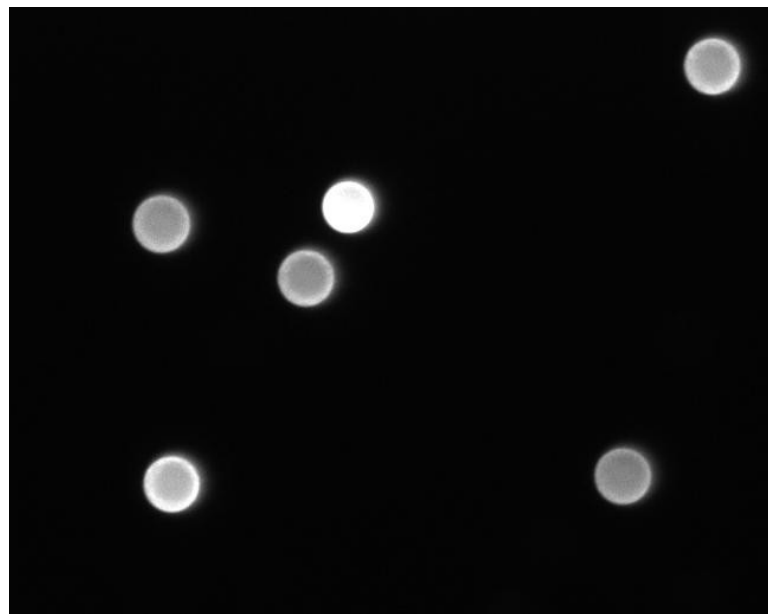


Figure 23: The image FC green-40X sec.ics

g)

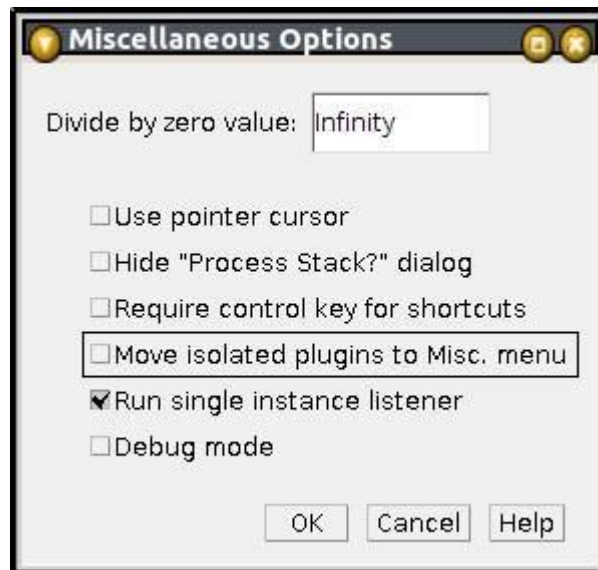


Figure 24: The misc-options dialog allows to activate the single-instance-listener.

In windows, select *open-with* > *Choose Program...* from the context menu of a tif-file. Browse to ImageJ.exe or select ImageJ Launcher if it appears already in the list. Select “Always use the selected program...” and press ok.

Solution 1.6: The ImageJ website

a)

26.11.7 Unsharp Mask...



Sharpens and enhances edges by subtracting a blurred version of the image (the unsharp mask) from the original.

Unsharp masking subtracts a blurred copy of the image and rescales the image to obtain the same contrast of large (low-frequency) structures as in the input image. This is equivalent to adding a high-pass filtered image and thus sharpens the image.

Radius The standard deviation (σ blur radius, cf. [Gaussian Blur... ↑](#)) of the Gaussian blur that is subtracted. Increasing the Gaussian blur radius will increase contrast.

Mask Weight Determines the strength of filtering, whereby *MaskWeight* = 1 would be an infinite weight of the high-pass filtered image that is added. Increasing the *Mask Weight* value will provide additional edge enhancement.

Figure 25: The documentation of the command unsharp mask.



Figure 26: The image before application of the unsharp mask filter.



Figure 27: The image after application of the unsharp mask filter.

- b) To the wiki of the workshop in which you are currently participating.
- c) Colocalization_Analysis, JACoP, ...
- d) I find nine plugins that have to do with colocalization:
 - Colocalization
 - Colocalization Finder
 - RG2B Colocalization
 - JACoP (Just Another Colocalization Plugin)
 - FRET and Colocalization Analyzer
 - IntraCell



- Find Colocalized Pixels in RGB Channels
 - CDA (Confined Displacement Algorithm for Colocalization)
 - Colocalization Colormap
- e) It downloads an image cells.tif and counts the number of cells in the image.

Slice	Count	Total Area	Average Size	Area Fraction	Mean	Mode	IntDen
cells-1.tif	72	14029.241	194.851	12.7	255	255	49686.894

Figure 28: The number of cells in the summary table.

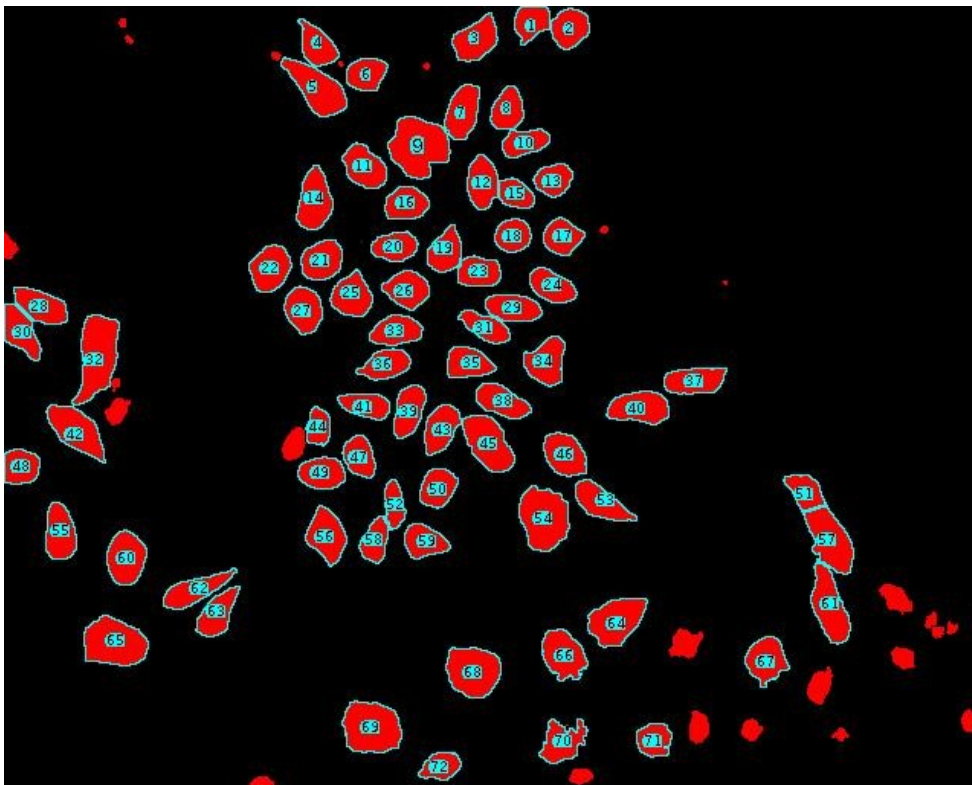


Figure 29: The outlines of the cells that have been counted by the macro.