

0- Start FigureJ by selecting the **Plugins>FigureJ>FigureJ** menu command.

1- **Three new tools** buttons are installed in ImageJ toolbar.

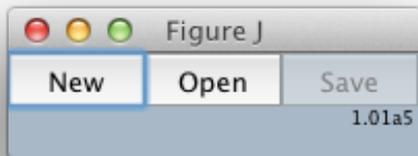


The **FigureJ main button** is selected:



You'll need to make sure this button is selected to use many of FigureJ features.

2- The '**New-Open-Save**' window also starts upon launching FigureJ.



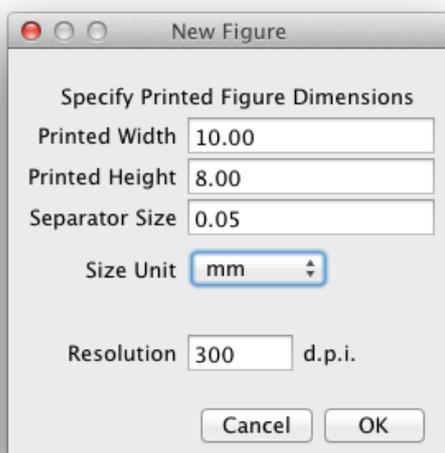
You'll need to access these buttons to:

- Create a new figure
- Open an existing *.figurej file
- Save a figure as a *.figurej file

Note: during to whole figure creation process, a FigureJ figure is also a standard ImageJ image. So you might also choose to save your figure as any other standard image file format (Tiff, Jpeg, Png, etc.). However, Only saving as a FigureJ *.figurej file will save all current figure features and allow reopening an editable figure.

3- **Create a new figure by pushing the New button** in the N-O-S window.

You'll be prompt to select figure dimension as shown in the following dialog:



Here specify **figure dimensions in real world units** (printed cm, mm or inches).

Also choose the **size of panel separators** (space separating images in a multi-image figure). This will allow FigureJ to preserve a perfect layout throughout your figure.

Finally choose required **resolution in dpi** or dots per inches, aka pixels per inches. You should find relevant requirements in the figures section of instructions for

authors of the target journal. A higher figure means better print quality.

4- The **Figure Control** panel is shown.



This **Figure Control** panel carries essential functions to create the figure layout and to fill image container panel with image content.

- The **Layout section** lets you create the figure layout **by splitting or removing** existing panels. The drop-down list lets you choose the **number of child panels** a parent panel should be split into. The **more...** button hides the advanced FigureJ **Options panel** that carries a number of advanced functions for panel labelling, figure annotation and miscellaneous (but interesting) items.

- The **Image section** allows choosing files that contain images of which portions are to be displayed in your figure's panels, using the **Open image** button. (see details below). Panel contents and properties can be propagated to other panels by a special copy-paste mechanism. The path and notes fields display relevant information about the current selected figure panel.

- The **External Tools** section is dedicated to accessing special functions provided by third party software. To date (rev. 1.01a6), this panel is only functional on MacOSX 10.8+, provided all matching software are properly installed and configured.

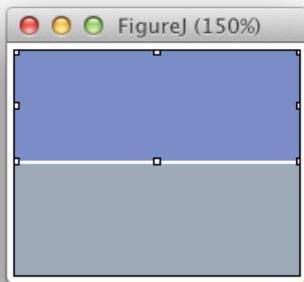
5- Everything is set up to get started, let's remind everyone with the **suggested workflow for figure creation** in FigureJ

- Create an empty figure with the final dimensions
- Create the figure layout
- Assign image content to all panels
- Annotate panels

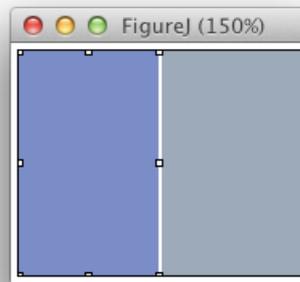
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- Save figure

6- Creating the **figure layout**



A

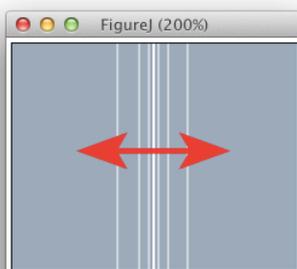


B

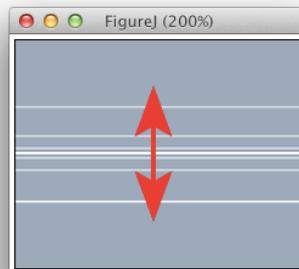


with the FigureJ tool selected click inside a panel to select it. A selected panel can be split either vertically (A) or horizontally (B).

Splitting a panel vertically yields two child panels of equal dimensions and an horizontal panel separator. Splitting a panel horizontally yields two child panels of equal dimensions and a vertical panel separator.

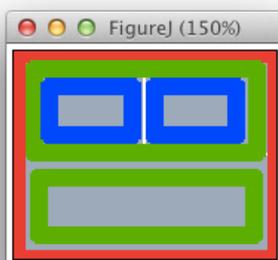


C



D

Vertical separators only want to be dragged horizontally (C) and horizontal separator only vertically (D).



Please note: adjusting separator changes dimensions of all neighbouring panels.

Removing panels.

If you remove a panel using the **remove** button, it will be cleared and merged with the closest child panel that originated from to same parent panel. In the example on the left, removing the bottom green panel will also extend the two blue panel so that they fill the whole figure height.

7. Filling panels with image content.

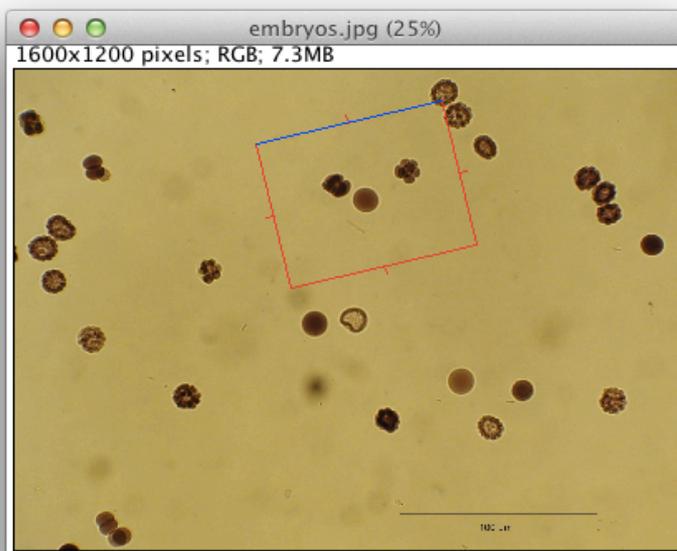
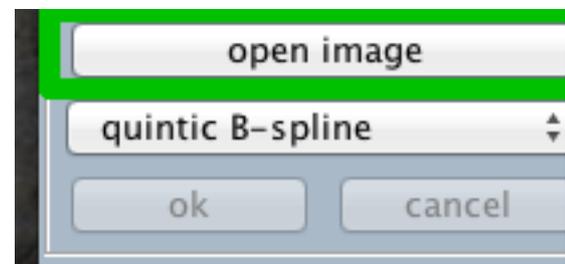
The easy way (does not yet work properly on windows)

Starting with FigureJ version 1.02, assigning content to figure panels is even more intuitive:

- Double click a figure panel to select a datasource or reopen it.
- Double click inside the ROI selection tool to validate the transform.

You can still use the standard procedure to assign image content in a figure panel is the following:

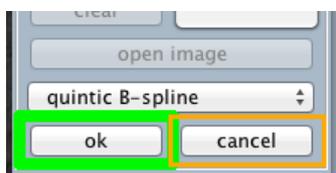
Click on the Figure Control panel **open image button**.



You'll be asked to select an image file in your file system. Select one file and choose **Open**.

The image is opened, displayed, and a special selection frame aka the **ROI selection tool** is overlaid on your image. Use this tool to visually select the image region to be inserted in your figure.

The *trick* in FigureJ is that this selection box is always of the **right aspect ratio**, so that what you visually select here will always **perfectly fit** the image panel you are targeting.



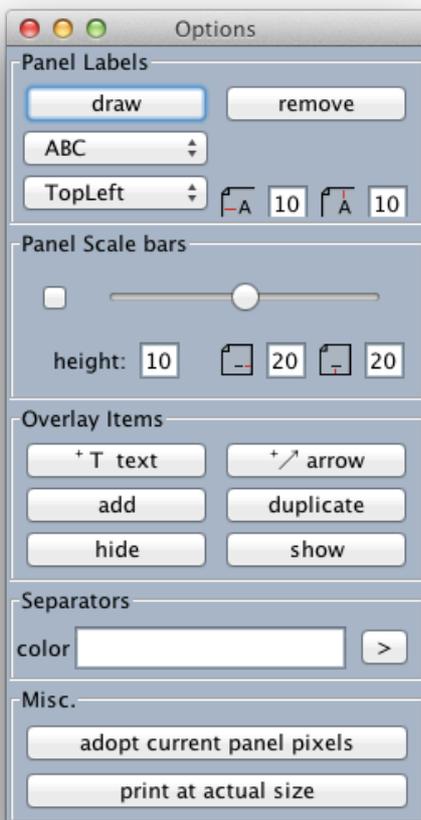
To validate the selected image region and transfer it to your figure, hit the **ok button**. If you changed your mind and want to select another image, hit the **cancel button**.

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Repeat this for every panel you need to fill with images.

8. The **Options** dialog.

You can open the **Options** dialog using the **more...** button in the **Figure Control** panel. This dialog carries several advanced functions for panel labelling, figure annotation and miscellaneous items.



Labelling panels:

Each panel can display a special annotation that we call the panel's label.

- select the desired panel
- click on the **draw** button

For each subsequent panel, the label index will be automatically increased, and new labels will be set according to the panel scheme drop-down list. If you need to restart from the first index, **alt-click** the **draw** button.

Labels positions is governed by the position drop-down list, and by label offsets fields. Labels are always drawn using ImageJ foreground colour.

Adding scale bars:

For scale-calibrated images, you can just:

- select the desired panel
- adjust the **scale bar slider**

Scale bars are always added at the lower right panel edge, with offsets and thickness as set in the matching fields. Scale bars are drawn using ImageJ front most colour.

See ImageJ documentation about how to scale-calibrate images. This can also be done on-the-fly during image content assignment.

Adding overlay elements to the figure:

The **Overlay Items** section allows you to add some useful overlay items to your figure, as text fields, arrows, or any standard ImageJ ROIs.

- Use the **text button** to add a new text object to the figure. Then type your text string, and use the **add button** to add this element to the figure overlay. Text font and size can be adjusted using the ImageJ built-in **Fonts** dialog.
- Use the **arrow button** to add a new arrow object to your figure. Arrows options can be adjusted with the matching dialog. Press the add button to add the current arrow to the overlay.

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- Use the **add button** to add any active ROI to the current overlay.
 - Use the **duplicate button** to add any active ROI to the current overlay and create a new similar ROI.
 - The **hide and show buttons**, toggle visibility for overlay objects.
9. **Saving and re-opening** your FigureJ figure.

The figure being built is at all times a standard ImageJ image, so you could use any of the save as commands that ImageJ provides. However, saving using the FigureJ N-O-S window **save button** should be preferred. By pressing this button, you will be asked to select a target folder in which all your figure data will be saved. Namely:

- An *.figurej file. Contains the layout and information about figure panels.
- Copies of all raw data files from which you selected image content.
- A Roiset.zip file containing the overlay objects you placed on your figure.
- An imageNotes.txt file describing the panel content in a human-friendly format.
- A flat Jpeg compressed (lower quality) version of your figure that you can use e.g. for presubmission.
- A flat full resolution Tiff format printer-ready version of your figure.

When re-opening your figures, use the FigureJ N-O-S window **open button** and select the *.figurej file inside the figure folder. It should restore a fully editable figure.

10. **Advanced** operations.

Interpolation schemes.

All the FigureJ software does it clean geometrical transforms of regions selected in raw data file, so that they perfectly match the target figure panel. These transforms include rotation, scaling and cropping. The scaling and rotation features are brought to FigureJ by the *imagescience* library. This library lets you choose between several interpolation schemes when transforming image data. Interpolation is the art of adjusting image data to different pixel dimensions.

In FigureJ, the available interpolation schemes are listed in 'quality' or 'smoothness' order, ranging from "nearest-neighbour" to "quintic B-spline".

Not every software allows choosing the interpolation scheme, but beware that smoother is not always better. Interpolation **does affect** original pixel values, so it should be used carefully.



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Interpolation schemes available thanks to the *imagescience* library.