Figure support

Section 1. Getting Started – Original Graph

In order to ensure that your figures are of the highest quality, it is recommended that all *ORIGINAL* images, worksheets, schematics, etc… be saved in an *ACCESSIBLE* location (*e.g.,* your personal computer, an external or USB drive, etc…) if your lab permits.

PowerPoint DOES NOT always preserve the highest resolution when you use it to save images. You can use it to create schematics or join panels but make sure the images you start with are big! A good rule of thumb is if you are creating a schematic or panel in PowerPoint, it roughly be the size of the slide (one figure per slide). The same rule goes for Excel or Matlab or any other graphics creator – make the initial graph large (for example, create the graph on the next worksheet of Excel) with font large enough to be legible. We'll say more about this in *Section 3*.

Section 2. Free Image Processing Software - GIMP

In order to ensure your image is large enough and a good enough resolution for printing, you may need to download image processing software. GIMP is free image processing software that is similar to Photoshop. It can be downloaded at http://www.gimp.org/downloads/. Scroll to the bottom toolbar and you can select Unix, Windows, or Mac for correct downloading files and procedures (Figure 1). Then follow the download instructions.
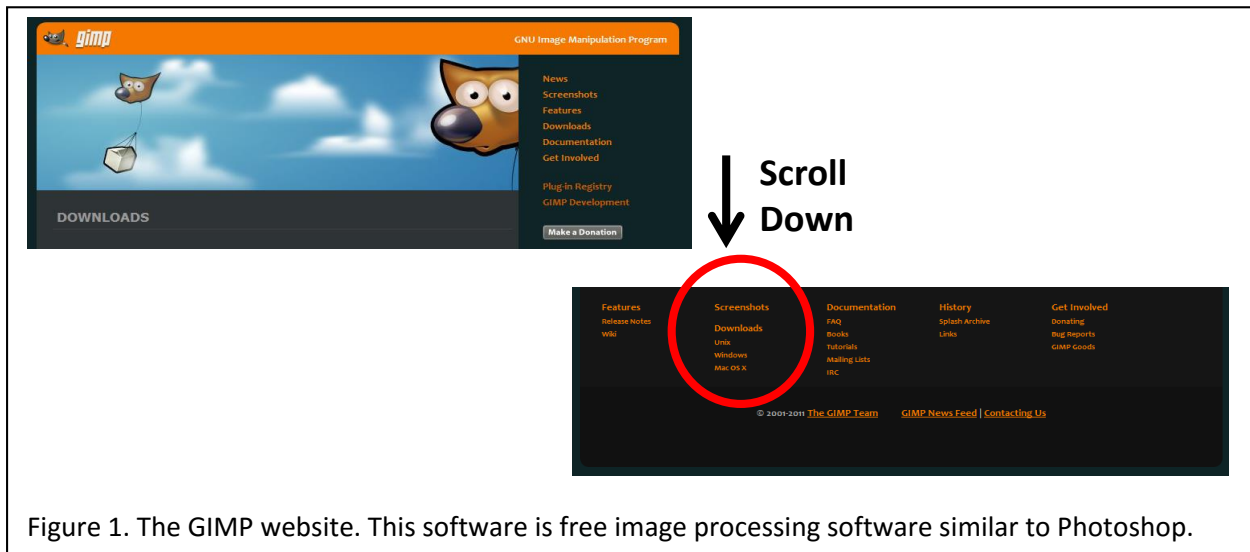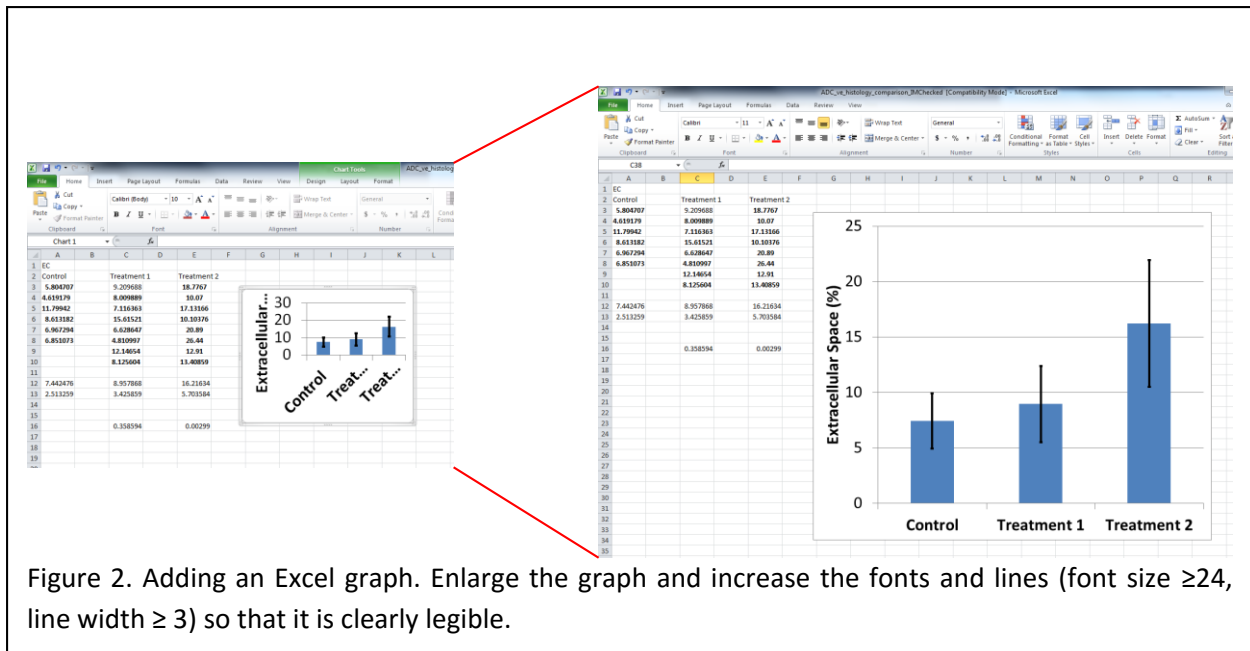

Figure 1. The GIMP website. This software is free image processing software similar to Photoshop.

Section 3. Add Your Figures to GIMP

Once you have downloaded GIMP, pull up the image or graph you would like to insert into your article. If it is an Excel graph, make sure the axes, lines, and legends (font size ≥24, line width ≥ 3) are appropriate size so that when you place it into your article, everything is still legible. Then, drag to enlarge the image such that all the titles/axes labels are visible (Figure 2).

Figure 2. Adding an Excel graph. Enlarge the graph and increase the fonts and lines (font size ≥24, line width ≥ 3) so that it is clearly legible.
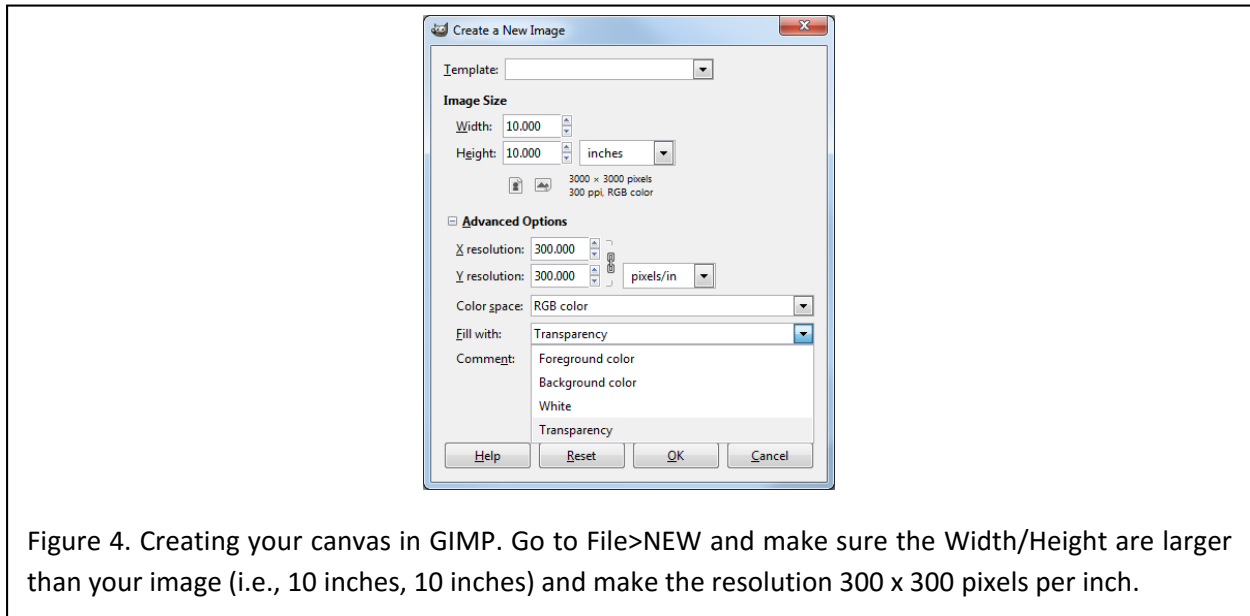
Similarly, if you are designing a figure/schematic in PowerPoint, ensure that the image is approximately the size of the slide. If it is bigger than the slide, that's ok – just adjust your view in the lower right-hand corner to 25-50%. Don't try to stretch or skew your image in PowerPoint though. Next, "Group***" the graphic (if it has multiple parts) and ensure that the graphics are large (the size of the slide) and that you fonts are legible (Figure 3).

Figure 3. Adding a PowerPoint image. Ensure that the image is approximately the size of the slide. If it is bigger than the slide, that's ok – just adjust your view in the lower right-hand corner to 25-50%. Don't try to stretch or skew your image in PowerPoint though. Make sure the fonts and lines are large enough (font size ≥24, line width ≥ 3) so that it is clearly legible.
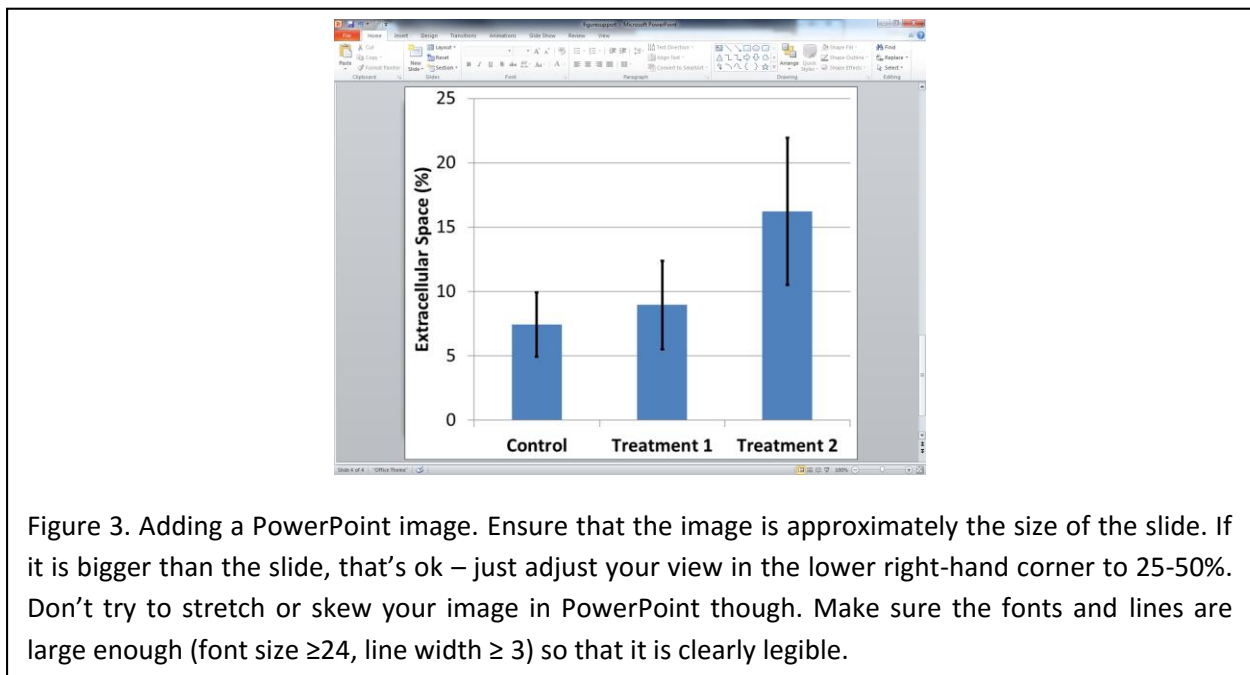
***You can "Group" objects by selecting all objects you wish to group, right click>Group. This will make multiple objects one figure.

Then, **select** the graph or grouped figure, **right click and select copy**.

In GIMP, go to **File>NEW**. For the new image size, change the units to **INCHES** and make the **width** and **height larger than your figure** (*i.e.,* 10 in, 10 in). Then, select **ADVANCED OPTIONS** and change the X resolution and Y resolution **to 300 pixels/inch and 300 pixels/inch**. If you would like a background color (or if you would like it transparent), drop down the *Fill with:* and choose. Otherwise, the default works fine (Figure 4).

Figure 4. Creating your canvas in GIMP. Go to File>NEW and make sure the Width/Height are larger than your image (i.e., 10 inches, 10 inches) and make the resolution 300 x 300 pixels per inch.

Then, **paste your image** onto the canvas. Once you can see it on the canvas in GIMP, go to **Image>Autocrop Image** in order to disregard everything outside the figure.

Section 4. Size Adjustments

Now, you have your image at 300 x 300 pixels/inch (you can check it using Image>Image Properties – it should say Resolution 300 x 300 ppi)! BUT it is probably really big compared to the space it will take up in your paper. Before you adjust the size, **save it at this size as figure1_large.jpg** (quality = high or 100). Then, go to **Image>Scale Image** and make sure the units for Width and Height are in inches. Now you can change the **width to reflect the template requirements - either a single column width (3.3 inches) or a double column width (7.0 inches)**. The height should autoscale. This new figure can **be saved as figure1_small.jpg** (quality = high or 100) (Figure 5).
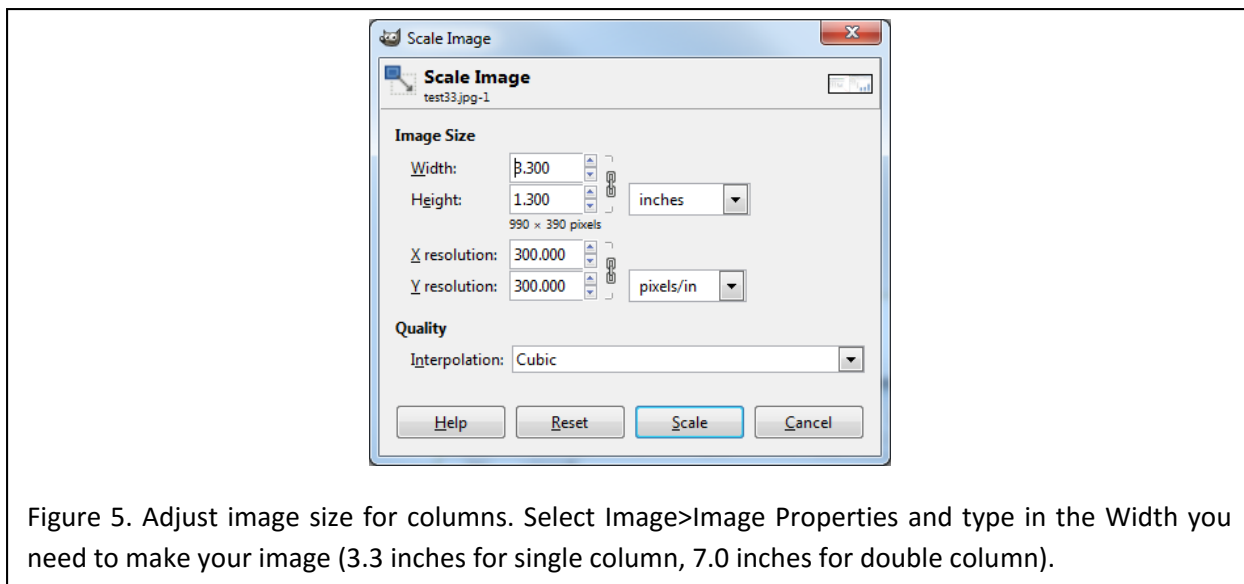
Figure 5. Adjust image size for columns. Select Image>Image Properties and type in the Width you need to make your image (3.3 inches for single column, 7.0 inches for double column).

Section 5. Table of Contents Image

Now that you know how to adjust the size of the image, pull up the image you would like to use for your Table of Contents figure. Adjust the figure such that it is **3.5cm square**. However, for thumbnails that cannot be square, an image **no wider than 7.0 cm and no taller than 3.5 cm** may be submitted. Save it as TOCfigure.jpg and upload it in the appropriate field at submission time.

Section 6. Upload Images

Now you should be all set! You have **two files for every figure in your article** – both are high resolution but different sizes (which are useful for print and for online viewing) in addition to your **Table of Contents figure**.

You can add the smaller figure into your paper and upload the "_large.jpg" as a separate file at submission. Additionally, if you are **submitting a figure for the Cover competition**, please use the "_large.jpg" file and upload it to the designated section.