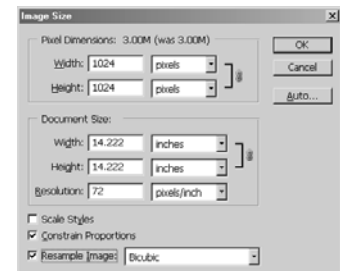




Assembling figures for publication


We often encounter labs that use Powerpoint to assemble figures for publication. There's no denying that Powerpoint is a fairly easy software program to use for laying out figures. The problem is that Powerpoint applies the lossy JPEG algorithm to images. JPEG can take crisp images and turn them into slightly fuzzy ones, particularly at the level of fine detail. We've also seen instances where it appeared as if the image was distorted when it was resized. This happens when a user doesn't change the image the same percentage in the X direction as in the Y direction. We believe that bitmap manipulation programs like Corel PhotoPaint™, Adobe Illustrator™ or Adobe Photoshop™ are much more appropriate for pasting together images for a figure.

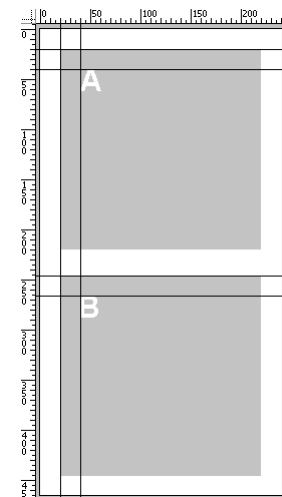
The requirements for authors information in professional journals will often state that electronic figures for publication need to be provided at a resolution of 300 or 600 dpi (*dots per inch*). If you open most digital images in Photoshop, the program will usually say that the image is 72 dpi (*or sometimes 96 dpi*). Don't change the settings until you are sure that you understand the power and danger inherent in the image size dialog box in Photoshop. To help you, we have written a handout entitled **Potentially the most dangerous dialog box in Adobe Photoshop™** which is available at: <http://swehsc.pharmacy.arizona.edu/exppath/resources/handouts.html>



Let's look at one of Photoshop's tools for lining up images and text in a figure. The tool is called "guides". Please note, these instructions are for Photoshop CS2, but they should work with earlier versions.

Since you should always be working with copies of your original images, it's best to create a new blank canvas to work on. Choose FILE | NEW and set the size of your new image to include enough pixels (*not inches*) across and down to accommodate the size of all the images you want to paste in, plus a few hundred pixels of extra space that you can crop out later.

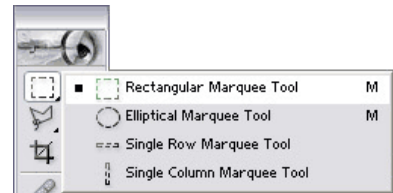
To use guides, you must first have the rulers turned on, do this by making sure that the menu item VIEW | RULERS is checked. Rulers use inches by default, to change the scale to pixels go to the menu item EDIT | PREFERENCES | UNITS & RULERS. To create a guide, place your mouse pointer over one of the rulers, click and drag a guide out into the image. Guides can be moved around with the mouse using the  tool. You can pull as many guides onto an image as you need and align them to specific values on the ruler. If you turn on the "snap to" feature, using the menu item VIEW | SNAP TO | GUIDES, your images and text will click right into the intersection of horizontal and vertical guides. You can also use guides to precisely control the amount of white space between the images in your figure. The great thing about the guides is that they only appear in Photoshop's PSD file format, when you save the final image as TIFF the guides disappear.



Guides are used to line up the images with the text overlay.

Once you've pasted your images into the figure, aligned the images to the guides, added a scalebar (*if needed*), and added the text overlays, then you are ready to consider sizing the image for the publication. Before you resize, be sure to save a copy of the image in Adobe Photoshop's PSD format with a different name (*just in case you're asked to use one of the images for the journal cover*). Now that you've saved your copy, go to the menu item LAYER | FLATTEN IMAGE, this will ensure that when you re-size the image, the text layers (*in particular*) will size along with the images. Go ahead and save the file at this step as well (*use a different name*) just to be sure.

Now, using the rectangular marquee tool, draw a box around your figure (if you set up guides on all four sides, you can crop right to the edge of the images because the selection box will “snap to” the guides) and choose the menu item IMAGE | CROP. Now go to the menu item IMAGE | IMAGE SIZE to find out the dimensions of your figure in pixels. In this dialog box, uncheck the RESAMPLE IMAGE box and change the number in the RESOLUTION box



to 300 or 600 (depending on the dpi your journal requires), then click OK to apply this change. Now re-open the IMAGE SIZE dialog box, recheck the RESAMPLE IMAGE box, make sure the CONSTRAIN PROPORTIONS box is checked and you can change the values of the width and height to fit the dimensions of the space allotted by the journal. Do not perform this resampling step more than once. The resampling will change the scale of all the individual images in the figure uniformly, then save the figure as a TIFF file for submission to the journal.

This may seem complex, but it's really pretty easy. There are other things that you might want to know about using layers and working with text in Photoshop, however, we ran out of space in this issue. Contact the Core and we can walk you through the whole process of setting up figures for publications.