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Digital Art Guidelines

To publish the figures in your article with the highest quality, it is important to submit digital art that conforms to the appropriate resolution, size, color mode, and file format. Doing so will help to avoid delays in publication and maximize the quality of images.

Sizing and preparation: Submit figures at their final publication size; do not scale figures. Prepare figures at one of the column widths in the table to the right. The height of all figures must be less than or equal to 9.375" / 23.8 cm / 56.2 picas.

Columns	Inches	Centimeters	Picas
1	3.25	8.3	19.75
1.5	4.5	11.5	27.25
2	6.75	17.3	41.0

Labeling and Font Usage: Provide labels for all multipanel figures (i.e. A, B, C, D) using uppercase 11 point Helvetica Bold or Arial Bold. For text within the figures, please use the same font for all figures in your manuscript, and use a standard font such as Arial, Helvetica, Times, Symbol, Mathematical Pi, and European Pi. Do not use varying letter type sizes within a single figure; use the same size or similar sizes throughout. The preferred font size is 8 points; the minimum font size is 6 points.

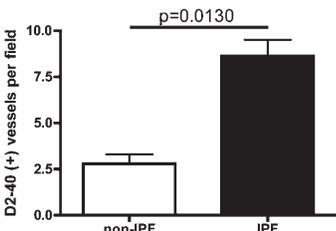
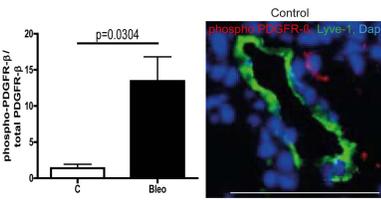
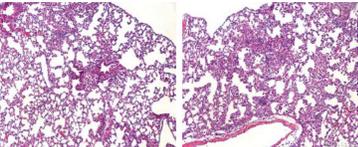
IMPORTANT Submit Vector Artwork whenever possible. There are two categories of Digital Artwork:

1. **Raster Images** (i.e. pixel-based; also called bitmapped images; TIF and JPG files support raster data only.)
2. **Vector Images** (i.e. object-based; PDF, EPS, AI, and PPT files support both vector and raster data.)

Vector images are preferred because they are resolution-independent - they have the highest quality and produce the best results in publication. See next page for more information on vector artwork.

1. Raster Images and Resolution: Low-resolution images are one of the leading causes of art resubmission and schedule delays. Submitted raster (i.e. pixel-based) images must meet the minimum resolution requirements. Raster images can be classified as monochrome (line-art), halftone, or combination halftone. TIF, EPS, or PPT file formats are preferred. Preferably, provide text and line-art in vector format.

- **Monochrome (1-bit) images (line-art):** Common examples are graphs and charts made of solid black and white, with no gray values. The suggested minimum resolution for this type of image is 1000 ppi at publication size.
- **Combination Halftones:** Common examples are color or grayscale figures containing halftone and line art elements. The suggested minimum resolution for this type of image is 600 ppi at publication size.
- **Halftones:** Common examples are color or grayscale figures containing pictures only, with no text or line art. The suggested minimum resolution for this type of image is 300 ppi at publication size.

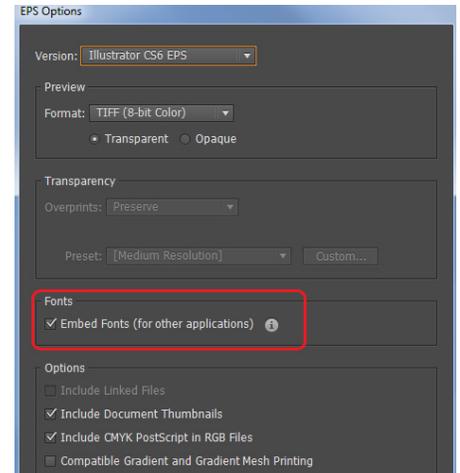
Monochrome (line-art)	Combination Halftones (grayscale or color images with text or line-art)	Halftones (grayscale or color images with no text or line-art)
		
1000 ppi at publication size	600 ppi at publication size	300 ppi at publication size

Color Mode: All color image files must be submitted in their original RGB color. To ensure accurate color in publication when you work with raster images, it is best to use an application that supports ICC profiles, such as Adobe Photoshop. Whatever application you use, be sure to always embed the originating ICC profile when saving the file. This is usually the default behavior - for example, this screen shot is from the Save As... dialog box in Photoshop. The box to embed the ICC profile is checked by default, just be sure to leave the box checked. If you are using a different application, please check the documentation to be sure you are properly embedding the ICC profiles.



2. Vector Artwork: Vector images are typically generated using drawing or illustration programs (e.g., Adobe Illustrator) and are composed of mathematically defined geometric shapes—lines, objects, and fills. Vector graphics are resolution independent and can be enlarged to any size without quality loss.

- **Vector line art:** Common examples are graphs and charts created in illustration programs. It is preferable to have these saved as EPS files, with all fonts embedded or converted to outlines, and graph lines at least 0.25 points thick.
- **Combination line/halftone:** Common examples are color or grayscale figures containing halftone and line art elements. The halftone elements should be processed in Photoshop and the line elements in Illustrator, and the two elements from the two applications should be combined in Illustrator. It is preferable to have these saved as EPS files, with all fonts embedded or converted to outlines, and graph lines at least 0.25 points thick.

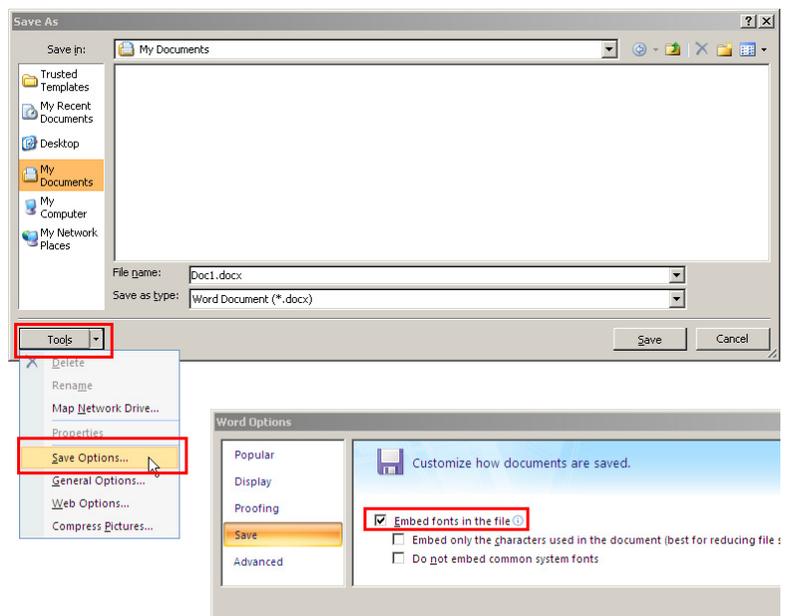


Microsoft Office: Figures submitted in Word, Excel, or PowerPoint are acceptable but should be avoided if possible. If MS Office is your only choice, please follow these general rules to ensure that the file is properly prepared:

1. Do not use pattern or textured fills in graphics. Instead, use solid fills or percentage screens: these will be effectively maintained as vector data during file conversion. **Note:** A 20% difference in percent screens is most effective for differentiation.
2. Artwork placed within any MS Office application should be of acceptable minimum resolution for print production: 300 ppi for halftones, 600-900 ppi for combinations, and 1000-1200 ppi for line art.
3. When inserting pictures/images into files, be sure to select “insert” rather than “insert link.” The latter will not properly embed the high-resolution image into the MS Office file.
4. For each and every file created in MS Office, **before** saving the file, choose File>Options>Advanced and check the box labeled “Do not compress images in file.” (This will help ensure that high resolution is maintained.)
5. Always embed fonts in your documents. See the guidelines below for embedding fonts in MS Office documents.

Embedding Fonts in MS Office:

- From the file menu, select Save As...
- From the **Tools** menu, select **Save Options...**, then check the **Embed Fonts in the file** box as shown below. These screen shots are from MS Office 2007 for Windows. If you are using a different version, these boxes may look different, but the instructions above should suffice.



Authors who do not comply with these guidelines will be asked to resubmit their figures in a print-quality format, which may delay publication.

FAQ

What graphics formats are not acceptable?

Figures prepared as VSD, GIF, JPEG, BMP, or any other file formats not listed as acceptable cannot be processed except in the case of an author photo.

Can you improve the quality of a figure?

Original image quality is very important to how your graphics will reproduce. Even though we can accept graphics in many formats, and make revisions when necessary, we cannot vastly improve your graphics. If a graphic is submitted at low quality, it cannot be “improved” during the publication process.

Can I take my graphics off of the Web?

No. Graphics on the web are optimized for speed of download, and are of low resolution (72 dpi). As the minimum resolution for a figure is 300dpi, graphics originating from websites tend to reproduce very poorly. Please note that increasing the resolution of a low resolution image WILL NOT improve the quality of the image, and is unacceptable.