

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 your images.

Sizing and preparation: Submit figures at their final publication size; do not scale figures (printed 1:1). Most figures should fit within a single column. See the table to the right for allowable widths. The height of all figures must be $\leq 9.375''$ / 24 cm / 56.6 picas.

| No. of Columns | Inches | Centimeters | Picas |
|----------------|--------------|-------------|-----------|
| 1 | ≤ 3.5 | ≤ 8.9 | ≤ 21 |
| 2 | ≤ 7.125 | ≤ 18.2 | ≤ 43 |

All panels of a multipart figure should be provided in the same file. If symbols are not explained on the face of the figure, only standard print characters may be used. Include figure titles in the legend and not on the figure itself. Photomicrographs and electron micrographs must be labeled with a magnification calibration in micrometers or Angstrom units. A statement concerning the magnification must appear in the figure legend.

Labeling and Font Usage: Use the same font for all figures in your manuscript, and use a standard font such as Arial, Helvetica, Times New Roman, Symbol, Mathematical Pi, and European Pi. Do not use varying 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. Embed all fonts used in vector files. In Illustrator, either convert text to outlines or check the box that reads **Embed Fonts** when saving the file.

Number each figure at the bottom, outside the image area. Do not put a box around the figure.

Images fall into either of two categories:

- **Raster Images** (i.e., pixel-based, also called bitmapped images) or
- **Vector Images** (i.e., EPS, AI, and PDF files).

Vector images produce the best results and are preferred. Avoid using MS PowerPoint to prepare your figures. JPEG, GIF, PNG, Excel, and Word files are not recommended formats for preparing figures.

Resolution and Raster Images: Low-resolution images are one of the leading causes of art resubmission and schedule delays. Submitted raster images must meet the minimum resolution requirements. Raster images can be classified as monochrome (line-art), halftone, or combination halftone. TIFF, EPS, PDF, or PNG file formats are preferred.

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

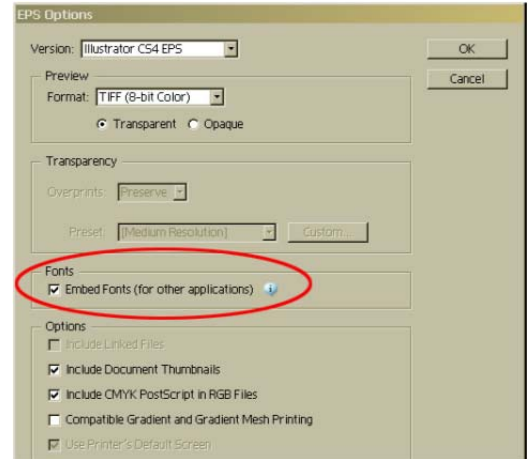
| Monochrome (line-art) | Combination Halftones (grayscale or color images with text or line-art) | Halftones (grayscale or color images with no text or line-art) |
|--------------------------|---|---|
| | | |
| 1000 ppi | 600 ppi | 300 ppi |

Color Mode: All color image files must be submitted in RGB color mode (not CMYK). 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; 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.



Vector Graphics: Vector images are typically generated using drawing or illustration programs (e.g., Adobe Illustrator) to produce EPS, AI, PPT, and PDF files. 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.

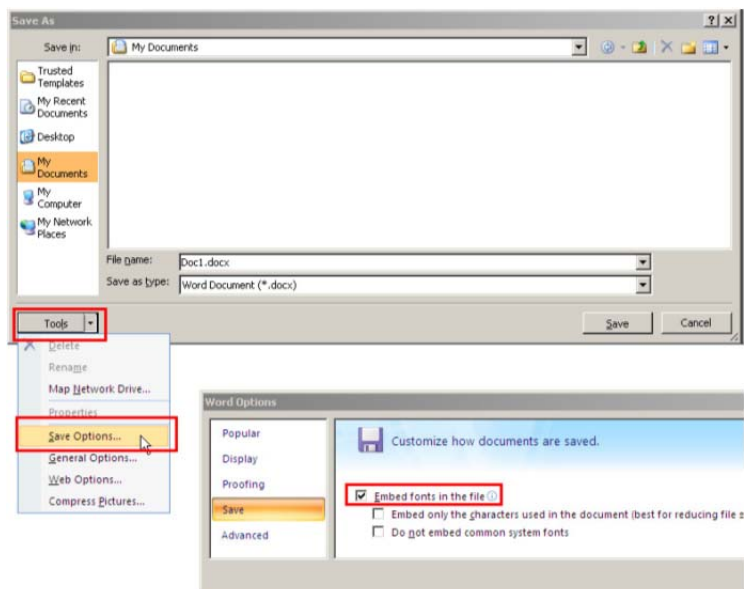


Microsoft Office: Figures submitted in Word or PowerPoint are acceptable but should be avoided if possible. Excel files are not supported. If MS Office is your only choice, please follow these general rules to ensure that the file is properly prepared:

1. Do not use pattern or textured fills in graphics. Instead, use solid fills or percentage screens that will be effectively converted to vector images 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. 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, which may delay publication.