

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 guidelines, including artwork type, size, resolution, color mode, and file format. Doing so will help to avoid delays in publication and maximize the quality of figures.

Sizing and preparation:

- Submit figures at their final publication size; do not scale.
- Prepare figures at either 1 column or 2 column width. (see chart to right.)
- The height of all figures must be less than or equal to 9.25" / 23.5 cm / 55.5 picas.

Columns	Inches	Centimeters	Picas
1	3.25	8.3	19.5
2	5.8	14.7	35

- Lines should be a minimum of 0.5-1 point thick when the figure is correctly sized to its corresponding column width.
- Titles should be clear and informative. Use minimal wording and confine explanation of figures to their legends.
- Figure and table legends should clearly and completely describe the appropriate content.

Labeling and Font Usage:

- Please use the same font for all figures in your manuscript.
- 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.
- Fonts should be embedded in the file.
- Avoid the use of reverse type (white lettering on darker background.)
- Avoid lettering on top of shaded or textured areas.
- Freehand lettering or drawing is unacceptable.
- Provide labels for all multipanel figures using lowercase 12 point Helvetica Bold or Arial Bold with parentheses. For example: **(a), (b), (c), (d)**.

Graphs:

- If shading is used, make differing shades vary by at least 20%, i.e. 0%, 20%, 40%, 60%, 80%, 100%.
- Graphs with axis measures containing very large or small numbers should convert to easily readable notations. Example: For an ordinate range of "counts per minute" values from 1,000 to 20,000, the true value may be multiplied by 10⁻³ (scale would read from 1 to 20) and the ordinate axis display "cpm (×10⁻³).". Similarly, for a Scatchard plot with values ranging from 0.1 to 2 femtomolar (10⁻¹⁵ M), the scale may run from 0.1 to 2 with the abscissa labeled "M(×10¹⁵).".
- Three-dimensional bar graphs will not be published if the information they refer to is only two-dimensional.

File Submission:

- Color charges will apply to all figures processed as color for print versions.
- Color figures cannot be replaced with black and white versions after acceptance.
- Submit one file per figure.
- Use the following naming convention: Author Last Name, figure number, file extension (e.g., *Smith_fig1.eps*.)

IMPORTANT Submit Vector Artwork whenever possible.

There are two categories of Digital Artwork:

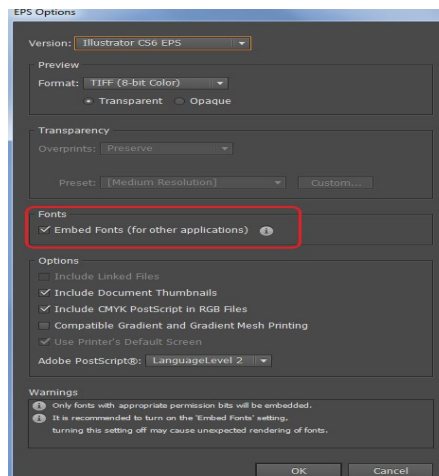
1. Vector Artwork (i.e. object-based; PDF, EPS, AI, and PPT files support both vector and raster data.)

This type of artwork is preferred when possible because it is resolution-independent and can be scaled to any size without quality loss, so it produces the best results in publication.

Vector artwork is typically generated using drawing or illustration programs (e.g., Adobe Illustrator) and are composed of mathematically defined geometric shapes—lines, objects, and fills. It cannot be used for photographic images.

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.



2. Raster Artwork (i.e., pixel-based; also called bitmapped images. TIF and JPG files support raster data only.)

This type of artwork is resolution-dependent, so does not have the same quality for text and line-art that can be provided with vector data, but it is the only option for photographic images.

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 file format using LZW compression is preferred. Preferably, provide text and line-art in vector format (see above).

- **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.

<p align="center">Monochrome (line-art)</p>	<p align="center">Combination Halftones (grayscale or color images with text or line-art)</p>	<p align="center">Halftones (grayscale or color images with no text or line-art)</p>
<p align="center">1000 ppi at publication size</p>	<p align="center">600 ppi at publication size</p>	<p align="center">300 ppi at publication size</p>

Color Mode:

All color image files should 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.

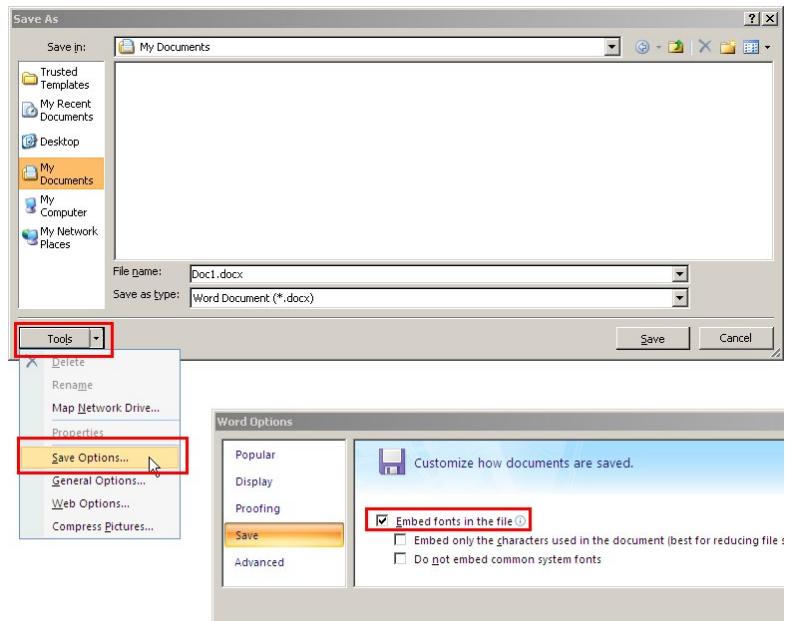


Microsoft Office: Figures submitted in Word, Excel, or PowerPoint are acceptable but should be avoided if possible. If MS Office is your only choice, please follow these general rules to ensure that the file is properly prepared:

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. Raster 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 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.



FAQ

Can figure quality be improved during production?

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 300 ppi, 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.

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