GENETICS

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Digital Art Guidelines

In order to publish the figures in your article with the highest quality, it is important that you submit digital art which conforms to the appropriate format, size, color mode, and resolution (if applicable). Doing so will help to avoid delays in publication and maximize the quality of images.

There are two categories of Digital Artwork:
1. **Raster** (i.e. pixel-based; also called "bitmapped;" TIF and JPG files support raster data only.)
2. **Vector** (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. Text and line-work (like charts, etc.) should always be provided in vector format. See the next page for more information on both types of artwork.

IMPORTANT **Submit Vector Artwork whenever possible.**

Acceptable Vector + Raster formats: PDF, EPS, AI (Adobe Illustrator), PPT (PowerPoint)
Acceptable Raster-only formats: TIF, PNG, JPG, PSD (Adobe Photoshop)
Unsupported file formats: BMP, GIF, PICT, XLS (Excel), CNV (Canvas), CDR (Corel Draw)

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.

Color:
☐ Use Proof Setup: Working CMYK
☑ ICC Profile: Adobe RGB (1998)

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" / 23.3 cm / 55 picas.

Columns	Inches	Centimeters	Picas
1	3.3	8.5	20.25
1.5	4.5	11.6	27.5
2	7	17.8	42.0

FAQS

**Can GSA 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 usually low resolution (72 or 96 ppi). 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.

Vector Artwork: Vector graphics are typically generated using drawing or illustration programs (e.g., Adobe Illustrator) and are composed of mathematically defined geometric shapes—lines, objects, and fills. Fonts used in vector applications are also vector graphics, but fonts used in Raster-only applications (like Adobe Photoshop) will be converted to Raster (i.e. pixels.) Vector graphics are resolution independent and can be enlarged to any size without quality loss.
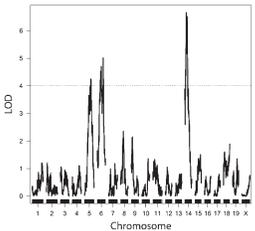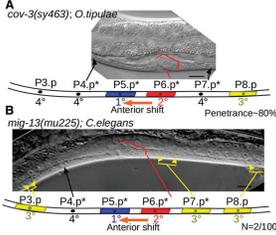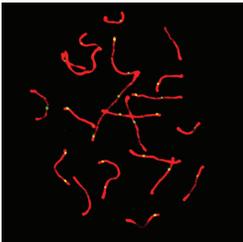

- **Vector line art:** Common examples are graphs and charts created in illustration programs. It is preferable to have these saved as EPS files, with all fonts embedded or converted to outlines, and graph lines at least 0.25 points thick.

- **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.
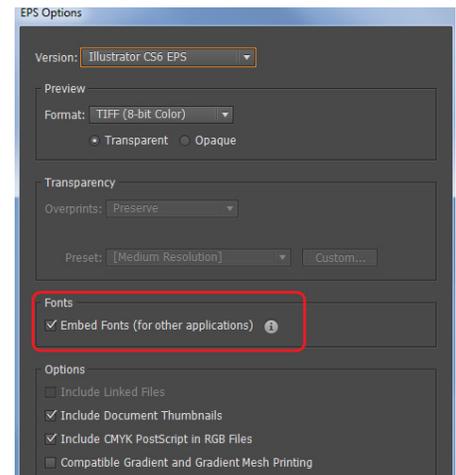
Raster Images and Resolution: Low-resolution images are one of the leading causes of art resubmission and schedule delays. Submitted raster (i.e. pixel-based) images must meet the minimum resolution requirements.
Raster images can be classified as monochrome (line-art), halftone, or combination halftone.
TIF or PNG file formats are preferred for raster images. 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 or textual 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**

Labeling and Font Usage:
- Provide panel labels for all multipanel figures (i.e. A, B, C, D) using uppercase 10 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 fonts such as Arial, Helvetica, Symbol, Mathematical Pi, and European Pi. Sans-serif fonts are preferable.
- Do not use varying letter type sizes within a single figure; use the same size or similar sizes throughout.
- The preferred font size is 8-10 points; the minimum font size is 6 points.
- Use Arrows and numbers to draw attention to areas you want to highlight.
- Pre-assemble multi-panel figures prior to submission. However, if this is not possible and the figure must be submitted in unattached parts, include a scan of how these should be arranged.
- Multi-panel figures must be part of one singular image/caption (for example, we cannot have Figure 1A, 1B, 1C as separate figures each with their own caption).
- Label all figures in numerical order with Arabic numerals, and cite figures in the text in their numerical order.
- When preparing the manuscript for publication, the copyeditors will insert or relocate a citation, or will renumber figures as needed.
- Within the label, be sure to distinguish between similar characters, such as the letter l and the number 1 or the letter O and the number 0.

Legends: Figure legends should start with a brief title and should be a self-contained description of the content of the figure that provides enough detail to fully understand the data presented. All conventional symbols used to indicate figure data points are available for typesetting; unconventional symbols should not be used. Italicize all mathematical variables (both in the figure legend and figure), genotypes, and additional symbols that are normally italicized.

PowerPoint: Figures submitted in PowerPoint are acceptable but should be avoided if possible. If PowerPoint 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 PowerPoint 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 PowerPoint file.
4. For each and every file created in PowerPoint, **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 PowerPoint files.

Embedding Fonts in PowerPoint:
- 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 PowerPoint 2007 for Windows. If you are using a different version, these boxes may look different, but the instructions above should suffice.
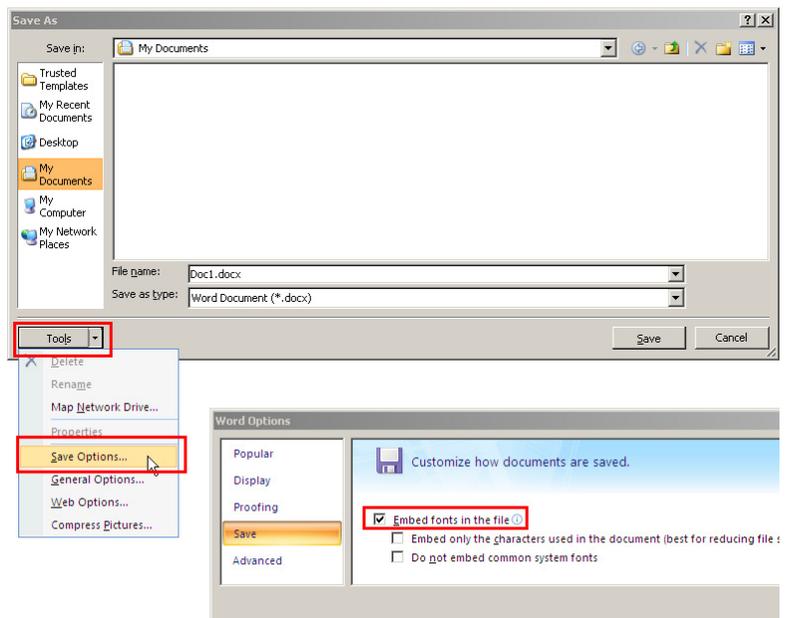
For Quick Reference:

Column Widths:
1 column: 3.3" / 8.5 cm / 20p3
1.5 columns: 4.5" / 11.6 cm / 27p6
2 columns: 7" / 17.8 cm / 42p0

Resolution Recommendations:
Halftone-only: 300ppi
Combo: 600ppi
Monochrome Line-Art: 1000ppi

Preferred file types:
Vector+Raster: PDF, EPS, AI
Raster-only: TIF, PNG, JPG, PSD

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