Annual Reviews Graphics Guide
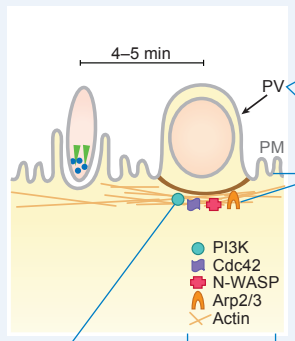
For series with integrated color

1. Keep figures editable

Annual Reviews may be different from other journals you may have worked with: We have a team of Illustration Editors who work with your figures to enhance them and ensure they are consistent with house style.

Therefore, while we would like the figures to be in final form, please make sure the files are not *flattened* or *uneditable*.
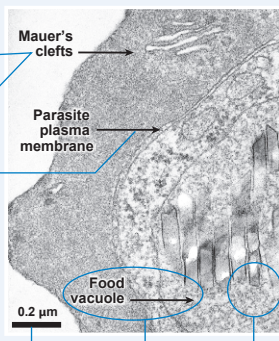
Examples of desired figure attributes:

Illustration

Photo

4–5 min
PV
PM

Text is live and *editable*, not *embedded*

Sans-serif font

Editable, vector lines, shapes, and arrows

- PI3K
- Cdc42
- N-WASP
- Arp2/3
- Actin

Color is used to emphasize the most important elements

Visual color key is included

Mauer's clefts

Parasite plasma membrane

Food vacuole

0.2 µm

Scale bar is labeled

Text and arrows are on separate *layers* from main image

Image is at high *resolution* (300 dpi)

See examples of our illustration capabilities at
www.annualreviews.org/page/authors/author-instructions

If you are creating your figures from scratch:

- DO send *vector* format wherever possible (for graphs, diagrams, etc.). Avoid creating line- or text-heavy diagrams in raster programs such as Photoshop.

- DON'T embed text/lines into photos. Put them on separate *layers*, or send one version with labels and one without. Suggested: place the photo in Illustrator or PowerPoint, then add text and lines, and send us the original .AI or .PPT file.

- DO make sure all photos you start with are high *resolution* (300 dpi).

If you are using previously published figures:

- DON'T simply pull low-resolution figures from journals online; these are not adequate for press-quality publication. Contact the author or publisher for high-*resolution*, *editable* files.

- DO obtain credit information and permission from publishers BEFORE submitting your figures. (Authors are responsible for obtaining all permissions.)

- DO tell us if the permission agreement requires that a figure remain exactly as it is. Otherwise we will make our standard adjustments.

2. Submit PDF files

- Always send us a high-quality PDF of the figure. If "save as PDF" is not an option, choose "Print" and select "PDF file" as the destination instead of your printer.

- Please ensure the file name includes the correct figure number.

- If you used the following programs to create the image, please also send the figure in original file format:

  Adobe Illustrator: .AI
  Adobe Photoshop: *layered* .PSD or .TIF
  Microsoft PowerPoint: .PPT
  Microsoft Excel: .XLS
  CorelDraw: .CDR

- AR encourages authors to submit video clips. Please see our supplemental material guidelines for information on format and compression:
  www.annualreviews.org/page/authors/author-instructions

Formats NOT accepted:

We generally cannot use native file formats of programs other than those listed in the left blue column. Unacceptable formats include:

Canvas (.CNV, .CVX)   Kaleidagraph (.QPC)
ChemDraw (.CHM)   Painter (.RIF)
Cricket Graph (.CGG)   SigmaPlot (various)
Freehand (.FH)   Visio (.VSD)

For files created in these and other programs not listed in the left column, please save as, export, or print to .PDF or .EPS.

3. Contact us with questions

If you have questions or need help creating figures, please ask your Production Editor to put you in touch with the Illustration Editor for your volume.

Graphics guide: additional information

Our general specs

- We prepare all figures to fit our layout, so you do not need to size your figures to fit our columns exactly. It's safest to err on the side of making figures larger and higher resolution than they need to be; it is easier for us to scale down as needed than to scale up. The largest image dimensions we can print per page are 6.33 x 7.9 inches.

- Photos must be at least 300-dpi resolution at final layout size. If you want an image to print at 3 x 3 inches, it must be 900 x 900 pixels.

- We change all text to a sans-serif typeface such as Myriad Pro, Arial, or Helvetica. If possible, please use one of these as you prepare files.

What is the difference between vector and raster?

Vector (object-oriented image)

Vector images are based on mathematically described points, lines, and areas; they can therefore be easily resized and edited.

Graphs, diagrams, schematics, and cladograms are usually created in a vector format and should be submitted as such.

Raster (bitmap or scanned image)

Raster images are made up of *pixels*, and thus cannot be easily edited or enlarged without losing *resolution* or image quality.

Photos, scans, and continuous-tone data plots are examples of intrinsically raster images, and are fine to submit as such.

File formats that are usually vector:	File formats that can be either vector or raster:	File formats that are always raster:
Adobe Illustrator (.AI)	Adobe Acrobat (.PDF)	Adobe Photoshop (.PSD)
PowerPoint (.PPT)	Encapsulated PostScript (.EPS)	.TIF, .JPG, .PNG, .GIF
PostScript (.PS)		

Why graphs and similar imagery should NOT be submitted in raster format:

Graph in vector form ✓

The vector image at the left is shown here *rasterized*, and is thus no longer easily *editable*. ⊘
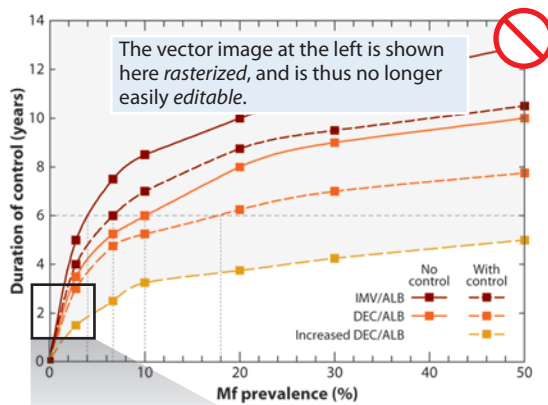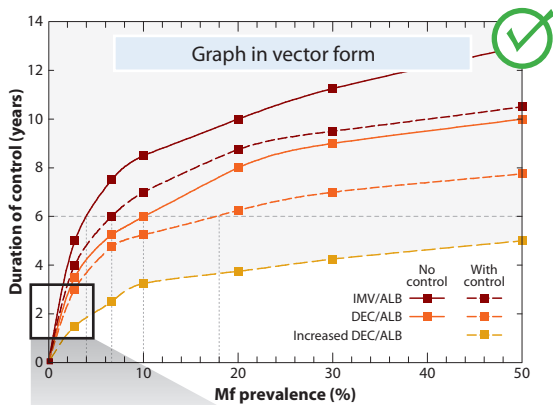
Resolution independent

Crisp at all magnifications

Imagery consists of a set of mathematically described objects, each separate, independent, and scalable without distortion

Detail

Editable

Control points are connected by lines called paths

Lines, colors, gradients, and type are instantly changeable

Paths can be manipulated with handles

Underlying wire-frame view

Resolution dependent

Jagged *pixelation* occurs when image is enlarged

Imagery consists of a grid of tiny adjacent square *pixels*, each one color

Resolution depends on size of pixels (i.e. dots per inch or dpi)

Detail

Not easily editable

No control points or paths

Can only be changed using photo retouching tools in Photoshop

Type is not live or *editable*

No wire-frame view exists

Graphics guide: additional information

Definitions

Bitmap: (*a*) A spatially mapped array of bits; that is, an image made up of a fixed number of *pixels*, also known as a *raster* image. (*b*) A raster image made up of one-bit data (black and white pixels only). This is the meaning used by Adobe Photoshop's bitmap mode. (*c*) Bitmap (BMP) image format, one of many raster file formats.

CMYK: A *color space* using the primary colors cyan, magenta, yellow, and black. K stands for key; black is the key plate on a traditional printing press.

Color space: A description or model of the range of all possible colors that can be displayed on screen or in print. Display devices such as computer monitors typically define colors using *RGB*, the primary colors of light. Printing processes typically use *CMYK*, the primary colors of ink. Annual Reviews converts all images to the CMYK color space to ensure our books print properly. The RGB color space is slightly larger than the CMYK color space due to the properties of transmitted versus reflected light. Therefore certain colors that can be shown in RGB (especially bright blues and greens) will look less bright when converted to CMYK.

For a visual comparison of RGB and CMYK color spaces, see "Illustration Enhancement: RGB vs. CMYK color" at **www.annualreviews.org/ page/authors/author-instructions**

dpi: A measurement of image resolution, described as dots per (linear) inch or *pixels* per (linear) inch (ppi). See *resolution* for more details.

Editable: An image containing text, lines, and other graphical elements that are live and can be separately selected, moved, edited, or deleted. Entirely *vector* files are the most easily editable. *Flattened raster* files are considered uneditable by Annual Reviews, as they can only be changed to a limited extent, using time-consuming photo-retouching tools. Typically, the format in which the file was originally created will be most editable, because the figure's creator would want to preserve the ability to easily move and change elements. For example, a Photoshop (PSD) file with a background photo and live text on top, on a separate layer, is considered editable. A JPG version of the same file would not be editable, because the layers would be flattened and the text would be *embedded* into the *pixels* making up the image.

Example of uneditable image—please make sure submitted files are *editable*.

Embedded text: all text has been converted to uneditable pixels

Rasterized image: lines that used to be crisp, editable vector are now converted to blurry pixels.

Embedded text: Text that has been *rasterized* and *flattened* into the pixels that make up a raster image. Embedded text becomes part of the image, permanently obscuring whatever was beneath it, and it cannot be moved or edited without altering the image. As a result of rasterization, embedded text often appears blurry or *pixelated* in print. Annual Reviews prefers that images be submitted with *editable* text, or text on a separate *layer*, or in two files, one with the text and the other without.
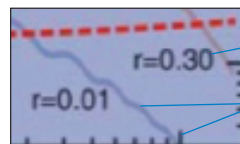
EPS: Encapsulated PostScript. A graphics file format used for both *vector* and *raster* images. EPS files can be read by a wide variety of software. Raster data saved in an EPS file cannot be read as vector data.

Flattened: A flattened image is one that was originally created with layers and/or vector components, then *rasterized* into a single-layer, non-*editable* "snapshot" image. Please avoid sending flattened images. Annual Reviews prefers graphics in a *vector* or *layered* format.

JPG or JPEG: A common file format for compressed raster images. JPG compression causes the image to permanently lose quality as the file is compressed or resaved. While this makes the file size much smaller, it may cause blurriness and smudgy compression artifacts around the edges of color regions. JPG images are commonly used on the Web, in PowerPoint files, and anywhere else small file size is more important than image quality. Unless they come straight from your digital camera in high resolution and have not been resaved repeatedly, JPG files are typically not acceptable for submission to Annual Reviews; use *TIF* instead.

JPG compression artifacts show in areas that were pure white before compression

AR Graphics guide: additional information

Definitions, continued

Layers: A way of arranging image files to allow for easy editing. In programs such as Adobe Photoshop and Illustrator, layers allow different components of an image to be kept in separate virtual spaces that are stacked like sheets of transparent acetate. Text can be kept on a separate layer from the rest of an image, so that it can be moved without affecting the underlying layer. In Photoshop, if multiple layers are merged into a single layer, the image has been *flattened* and is no longer *editable*. Annual Reviews prefers to receive layered files whenever possible.

PDF: Portable document format. A file format created to enable image and file transfers between software programs. Image, text, and layout information is stored in a manner that is independent of the operating system or software program in which the file was created. Because of its ability to protect the exact look of an image, while also preserving *vector* information, fonts, and image *resolution*, PDF is the preferred file format for figures submitted to Annual Reviews.

Pixel: Also called a picture element or dot, a pixel is the smallest element of a *raster* digital image. Each pixel is a small square of a single color that is arrayed in a grid adjacent to other pixels; viewed together, many tiny pixels form a larger visible image. The more pixels an image contains per unit area, the higher its *resolution* is, and the clearer and more detailed it will look.

Pixelated: Visibly showing *pixels*, for example as jagged edges on text or color transitions. If an image is at adequate *resolution*, no pixels should be visible to the naked eye at 100% size.

Raster: A term for an image made up of a fixed number of *pixels*, for example, a digital photo or scanned image. Raster images cannot be made larger in size without losing *resolution*, or image quality. Raster images are also sometimes referred to as *bitmap*. *(See "What is the difference between vector and raster?" on page 2.)*

Rasterize: To convert an image from *vector* format into *raster* format, rendering it largely un*editable*. Wherever possible, do not rasterize images before submitting them to Annual Reviews. For example, a graph exported from a graphing program as a TIF or JPG has been rasterized; exporting it as a PDF or EPS instead may preserve the *vector* data.

RGB: A *color space* using the primary colors red, green, and blue.

Resolution: The density of *pixels* (dots) in a *raster* image, usually measured in dots per (linear) inch (*dpi*). The higher the resolution of an image, the more pixels it contains, and the clearer and higher quality it appears when viewed or printed. Annual Reviews requests all *raster* images be at least 300 dpi, the standard resolution for printed images. For example, a 3 x 4-inch image at 300 dpi will measure 900 pixels wide by 1200 pixels high. Internet images are usually saved at low resolution (often 72 dpi) to minimize file size. While they may appear clear on screen, they will appear blurry or *pixelated* in print, and are not acceptable.

TIF or TIFF: Tagged image file format. A graphics file format used for *raster* files. TIF files tend to be large, stable, and readable by a wide variety of software. Annual Reviews prefers all raster images be submitted as TIF. Lossless compression such as LZW can be used to make TIF files smaller without losing image quality.

Vector: A type of image that is based on mathematical points connected by paths. Unlike *raster* images made of *pixels*, vector images are resolution-independent and can be resized without losing quality or sharpness. They are much smaller in file size, and they are easier to edit because the elements of an image are recognized as individual, overlapping shapes. Vector images can be converted into raster images (rasterized), but rasterized images cannot be converted back the other way. *(See "What is the difference between vector and raster?" on page 2.)*
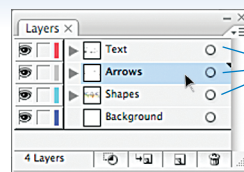
Layers allow different parts of an image, such as text, arrows, or shapes, to be separated and restacked.
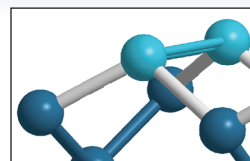
High-resolution image. Acceptable for publication at AR.

Low-resolution Web image, with evident pixelation. Not acceptable for publication at AR.