Get Your Message Across: A Guide to Artwork and Illustrations for Better Impact and Clarity

Wednesday, July 29, 2020  1:30 PM – 2:30 PM EDT

Live Q&A:

This workshop will cover the production of artwork and illustrations that effectively convey information and complex concepts. The workshop will consist of short presentations on principles of good design, using R/Python to generate complex data figures and software and other resources that can be used to produce effective figures. Pointers on fonts, colors, density of data, and design of graphs for publication will also be presented. The presentations will be followed by a question & answer period.

Patrice Salomé, Science Editor, the Plant Cell

Figure basics: size, colors, resolution…
Critical aspects of figure preparation:
+ Figure size
+ Font size and type
+ Placement of images and panels
+ Color combinations and color blindness
+ Saving figures in the right format and resolution
Graphics software packages

KaleidaGraph
Origin
Excel
R
RStudio

Adobe Photoshop
Affinity Photo
Adobe Illustrator
Affinity Designer
canvas
CorelDRAW
GIMP
Inkscape
Pixelmator

Generate data plots
Image processing
Figure assembly
First question: how big is the figure?

One-column format from several journals

Missing elements:
+ article header
+ margins (left, right, top, bottom)
+ FIGURE LEGENDS
Two-column format from several journals

Check Instructions for Authors

Set your page to one- or two-column width
Making figures is like furnishing a room/house
+ keep figures simple (when possible)
+ be mindful of the allowed space
+ group panels by topic
+ use the same style for all related panels (even across figures)
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+ use the same axis thickness throughout
+ the axes should NOT be thicker than the data lines
+ be mindful of default settings in your graphics software package
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PREPARE YOUR FIGURES AS A REVIEWER, NOT AN AUTHOR
Next question: which font to use?

Use one font throughout, and use the same font size

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<th>scaling factor</th>
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Especially important if figures are larger than the allotted width
Next question: how and where to place panels?

bad

good
Matching styles across similar graphs

More efficient use of space
Axis thickness

The data pop! Not the axes
Available color space: “normal” vs color blindness
Available color space: “normal” vs color blindness

- “normal”
- Deuteranopia (6%)
- Protanopia (2%)
- Tritanopia (<1%)
Microscopy images: red vs magenta and color blindness

“normal” vision

Deuteranopia/Protanopia

very limited distinction between red, green and the yellow overlay
Microscopy images: red vs magenta and color blindness

“normal” vision

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you can change the color by playing with “hue” in Photoshop (Affinity Designer, Pixelmator…)
Microscopy images: red vs magenta and color blindness

“normal” vision

Deuteranopia/Protanopia

now, all channels are clearly distinguishable
This is NOT data manipulation; this is data visualization. Microscopes do not “see” colors, they see grayscale images. The colors are added by the computer as a function of the laser and wavelength filters.
Choosing colorblind-friendly color palettes

+ Color Oracle (http://colororacle.org)
  Free download (for PC, Apple and Linux platforms)
  Turns your entire display into what someone with color blindness would see

+ Coblis (https://www.color-blindness.com/coblis-color-blindness-simulator/)
  Upload your file and select the type of color blindness
PDFs maintain text and element resolution

PDFs save a set of instructions, not the elements themselves (unless it is a picture)

TIFFs save the entire image as a set of pixels (including the “empty” white space)
But not TIFF files

400 dpi  
Hibiscus flower

100 dpi  
Hibiscus flower

25 dpi  
Hibiscus flower

Save TIFFs at high resolution with LZW compression
Further reading…

https://socviz.co/index.html#preface

https://serialmentor.com/dataviz/color-basics.html

https://journals.plos.org/ploscombiol/article?id=10.1371/journal.pcbi.1003833

https://journals.plos.org/plosone/s/figures

