Publishing images for papers & posters: CHEAT SHEET

Image check list

Before publishing, ensure images are informative, truthful, and legible.

- ❑ **Colors visible?** Grayscale and dark colors on light background have highest contrast. Test visibility in color blind mode e.g. with colororacle.org

- ❑ **Annotations complete?** Explain annotations and abbreviations in figure legend. Hint: best avoid abbreviations.

- ❑ **Image and text size on page:** Test print figures: are image features visible is text legible?

- ❑ **Image resolution:** Be careful with image compression when saving, avoid pixelated images.

- ❑ **No manipulation** No individual image feature may be enhanced, obscured, moved, removed, or introduced.

Magnification

Evidences in images must be visible to be convincing. Scientists should decide on the necessary detail and fill the frame to maximize the information/pixel.

Tissue information
Cellular information
Subcellular information
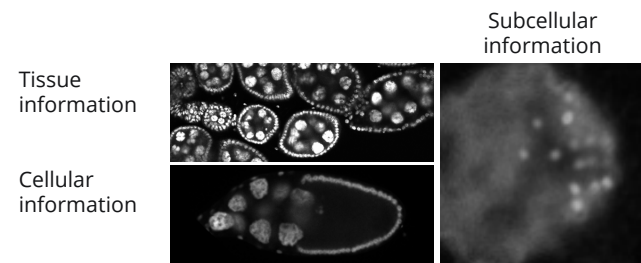
Zoom, Insets

Insets or zoomed regions-of-interest are used when two magnifications are needed. Indicate inset position in original image, do not obstruct key image features.
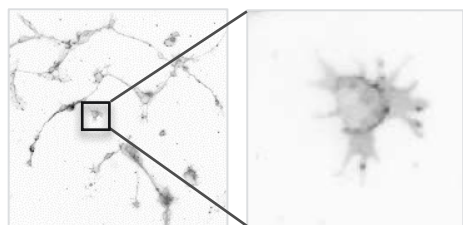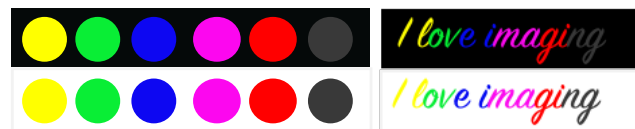
Color

Color or not?

- Photo of natural appearance, color helps.
- Micrograph of a colored stain (e.g. histology), color helps.
- Micrographs of fluorescent stain, imaged in grayscale, consider grayscale.
- Micrographs of 2-3 fluorescent stain color, use color-blind safe combination.
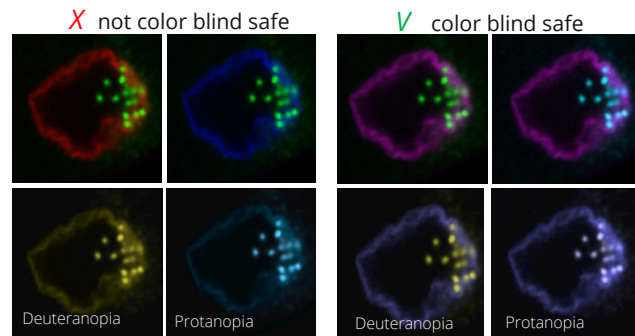- Electron micrographs, grayscale by default, use grayscale.

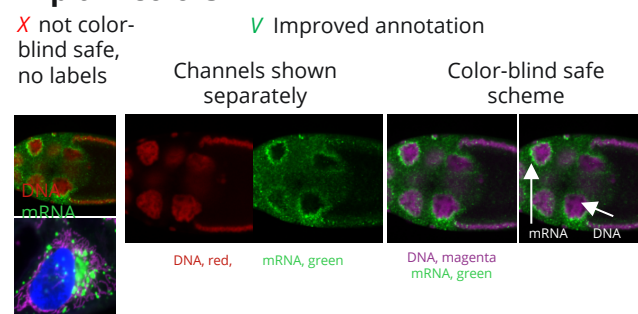### Which color? Visibility depends on color lightness and background color.

I love imaging
I love imaging

To a color blind, some colors are not distinguishable, often red and green (right).

This is invisible to color blind person.
This is invisible to a color blind person.

Pick color blind safe combination:
X not color blind safe
V color blind safe
Deuteranopia   Protanopia   Deuteranopia   Protanopia

Explain colors

X not color-blind safe, no labels
V Improved annotation
Channels shown separately
Color-blind safe scheme
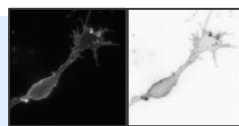
mRNA
DNA, red,   mRNA, green   DNA, magenta mRNA, green
mRNA   DNA

Resources for color
Channel colors are adjustable in ImageJ/FIJI, referred to as lookup tables (LUT). Colors can also be inverted and new LUTs defined.
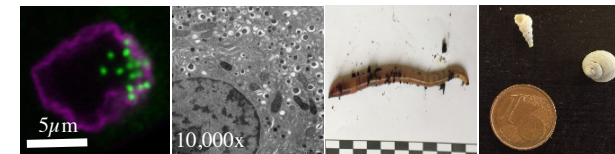
TIP Highest contrast: dark objects on light background, and in grayscale.
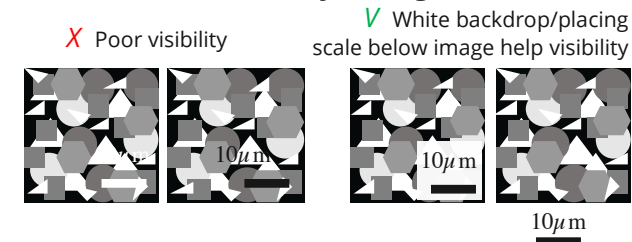
Annotate

Scale information
Every image needs a scale to relate it to reality. Options:

- Scale bar of known length, if possible dimensions annotated in image.
- Magnification of set-up indicated, less intuitive and error-prone.
- Tape measure/ruler included next to object in photo.
- Every day item shown next to object.

5µm   10,000x

Annotation on a busy background

X Poor visibility
10µm
V White backdrop/placing scale below image help visibility
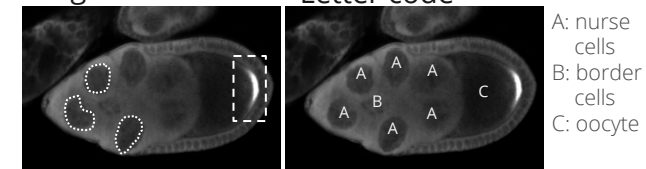10µm
10µm

TIP in FIJI to insert a very thin scale, then add rectangle as scale bar with figure design software to better adjust thickness/point size.

Point out details

Arrows
Migrating cells *
Nurse cell   # Oocyte

Lines
nurse cells
posterior
oocyte
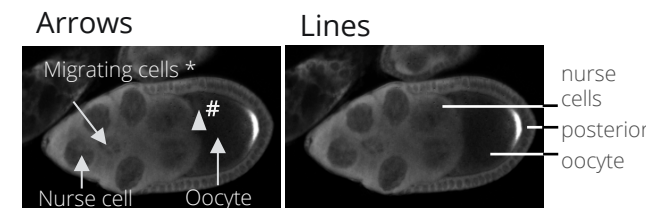
Region of interest

Letter code
A: nurse cells
B: border cells
C: oocyte

	Use	Tips
Arrows	Point to structure, show direction/movement (*)	Align, avoid arrow crossings
ROI	Point to entire structure	Choose suitable point size for dashed lines
Lines	Label at line end	Align, avoid line crossings
Letter	Label many features	Choose suitable font (sans serif)

TIP Avoid overlapping annotations and obstruction of key image features. Annotation colors should be color blind safe and aligned.

Layout

Reading direction
For multi-panel figures, choose either column or row layout for best readability. Mixed layouts are hard for audience and appear cluttered.

X mixed layout
V row layout
V column layout
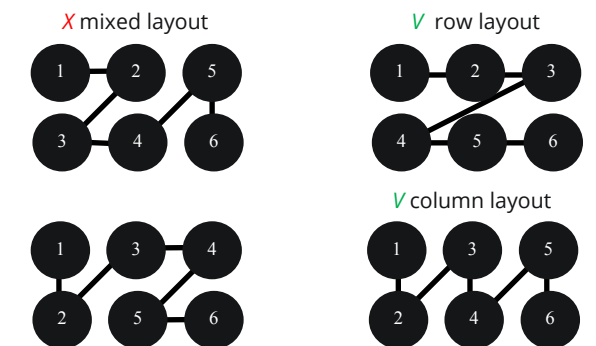
Place panels on grid with white space and imaginary lines to orient audiences. Panels should not extend beyond grid lines.

X no white space, panels violate grid lines
V white space supports row or column layout

TIP sketch, draw, use post-it & pen until it works. Only then start an electronic version.

For figure assembly use for example Inkscape, a free and open-source vector graphics editor.

Figure legend

Figure legends inform briefly about result, experiment, and figure elements.

- Include header, check journal guidelines
- Annotate images directly, if not possible indicate scale and colors in legend.
- State species (e.g. with RRID), tissue/cell type and treatment (e.g. antibody).
- Avoid method details and discussion.

TIP Get feedback! Test your figure by asking a colleague to explain it back to you: this quickly uncovers missing text, insufficient annotations etc.

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