Scientific illustration for commissioned content: Our guiding principles for conceptual figures

Nature-branded journals use a specific set of guidelines and principles to create our award-winning scientific illustration. This guide is a short summary created specifically to aid authors working with our editorial teams to create summary and explanatory figures for content like News & Views, Reviews and other expert-authored commissioned content, where draft figure suggestions are often redesigned and edited by in-house art teams, and consistent styling is applied. *This guide chiefly applies to conceptual figures (as opposed to data figures).*

Here we explain our basic principles of visual communication for scientific illustration:

<u>Hierarchy</u>
<u>Visual editing</u>
<u>Clarity</u>
<u>Accessibility</u>

As well as: <u>How to avoid common mistakes</u>

Hierarchy

Scientific diagrams by their nature contain layers of complex information. Our job as visual communicators is to guide the eye to the most important information first, creating a visual hierarchy that reflects the information hierarchy of the figure. There are a few key techniques that can be used to create visual hierarchy, such as use of colour and drawing for focus.
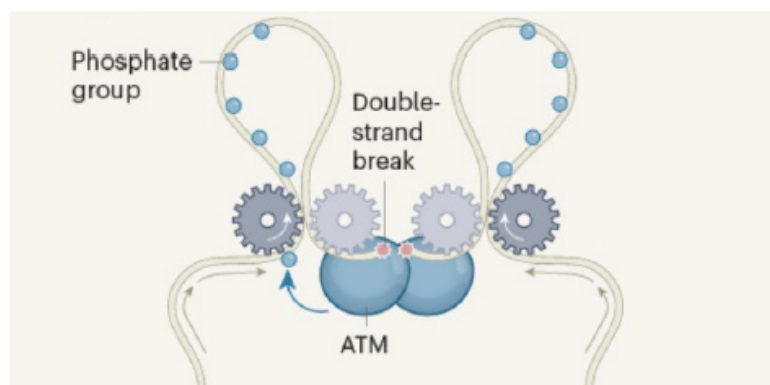
Colour. The most important elements of a figure should be the most saturated - weighted by significance - with background elements in a more neutral tone. We use a consistent colour palette for areas of focus within each figure or set of figures.
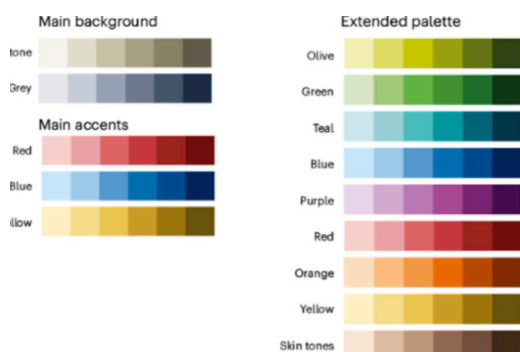
Our Nature-branded colour palette is designed with hierarchy in mind - with background colour for contextual elements, and accents for the main action.
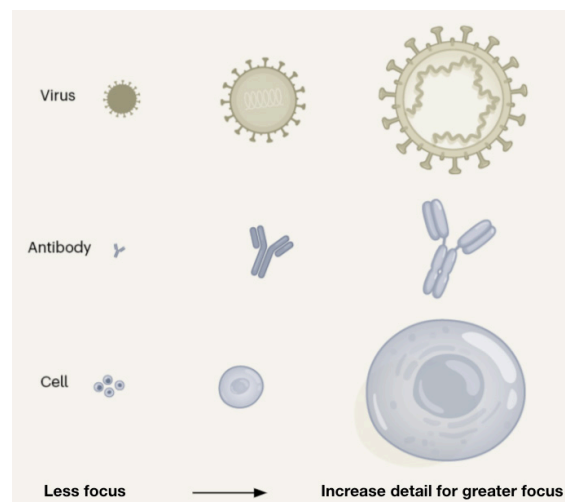
Drawing for focus. Hierarchy can be achieved through drawing technique. For areas of focus, add depth and detail; for areas of less focus, simplify.
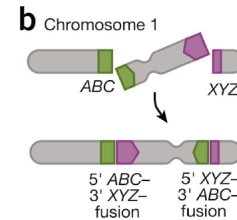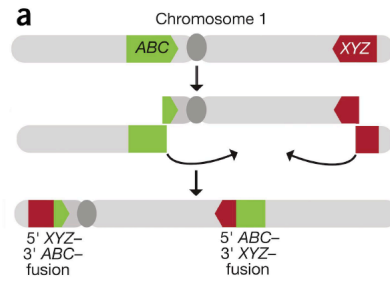
Visual editing

Just like good prose, the more intuitively and clearly a figure reads, the more refinement it probably took to get there. There can be a misconception that art editors simply 're-draw' proposed figures to make them 'look pretty'. In truth, we more often 'redesign' them to make them understandable. Just like text editing, visual editing takes time and expertise.

As art editors working on the world's best scientific content, we use principles of visual editing when approaching each figure.

We ask ourselves:
- What are the essential elements?
- Is anything missing?
- What can we remove and still clearly communicate?
- Is there unnecessary repetition?
- Is there unnecessary decoration?

Visual editing. The top figure (a) features redundant elements and ambiguous arrows. By merging steps and refining the action with a single arrow, the process shown is more clearly and intuitively (b).

Clarity

Scientific diagrams often visualise complexity. Therefore, it is essential to ensure that every element is defined. There should be no ambiguity.

We aim to:
- Explain all elements in labels or the legend.
- Label the first instance of every object.
- Use figure parts (a,b, etc) and subheadings to give the figure hierarchy and structure.
- Remove unnecessary elements.

X We try to avoid:
- Using icons for the sake of decoration.
  Only use icons to aid understanding and context.
- Relying solely on colour for definition.
  Try to label where possible.
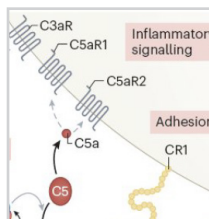- Using multiple arrow weights and styles when their meaning is not clear.
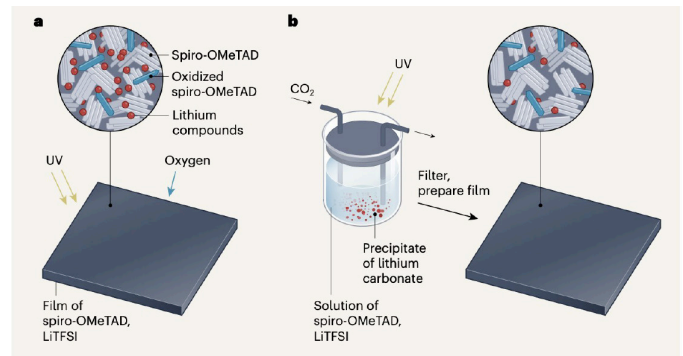
DO clearly define all elements in a figure.
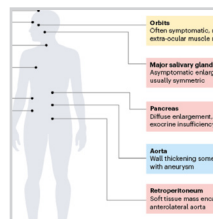
Accessibility

We aim to create illustrations that are as accessible as possible to those with disabilities, such as colour blindness or other visual impairments. **We do this by:**
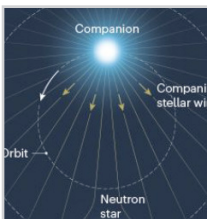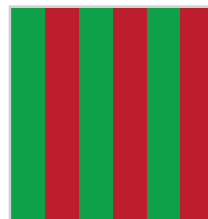
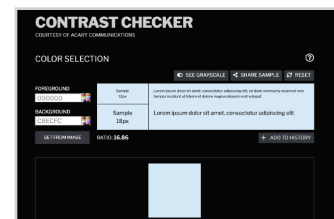Using our colour palette properly, to **ensure adequate contrast.**

Using primarily **black type** rather than coloured.

Adhering to rules for **colour behind text.**

X Avoiding red/green colour combinations.

Using tools to check for colour blindness and contrast.

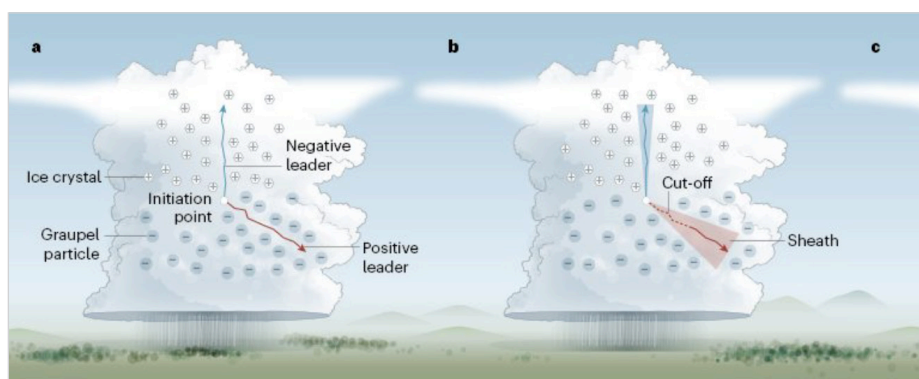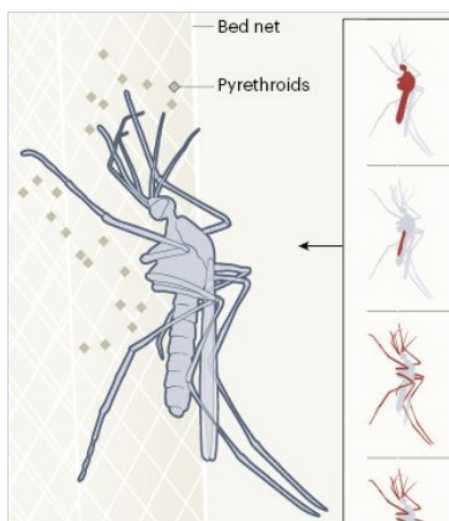# Common mistakes

✗ Expecting submitted figures to run without edits. It is important to know that your figures will be edited for content, style and accessibility, even if you have commissioned them from a third-party artist/designer, or have used a third-party scientific illustration tool or service.

✗ Too many colours / random use of colour. The Nature-branded colour palette has been designed specifically for scientific illustration. The organisation of the palette reflects our principles of hierarchy, clarity and accessibility, and has been thoroughly tested.
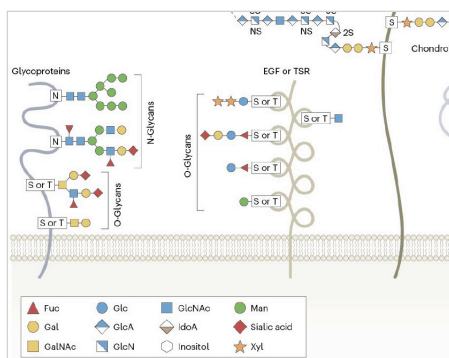
We use colour thoughtfully, for:

- Hierarchy
- Categorising information
- Scientific conventions, or real world depictions (colours as found in nature, as appropriate)


Summary figures require focused attention to important elements, highlighting them with our main accent colours from the palette, for maximum contrast. Backgrounds elements share the same neutral tone.


Some scientific disciplines use specific colours in their diagrams to represent elements, and we will go off-palette to respect these conventions.

Representations of the natural world, such as plants, animals, bodies of water and environmental scenes, can be drawn realistically as needed, using the extended colour palette. This is usually necessary when they are the focus of an illustration, rather than in the background.
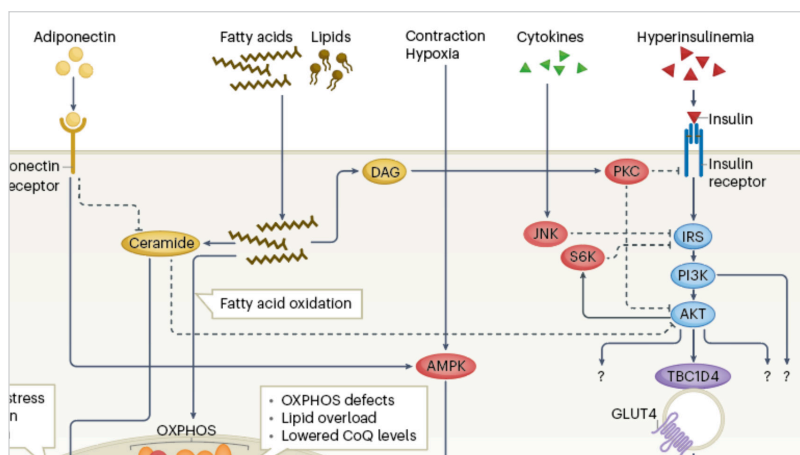
For complex figures, and for multi-panel figure sets, **colours can be used to help categorise information and group elements.** Our extended palette is available as needed for this type of use.

Common mistakes

Is it a figure? We are occasionally presented with figures that would be better displayed as lists or tables. Usually these 'faux figures' are tables dressed up with unnecessary icons that do not aid communication or comprehension.
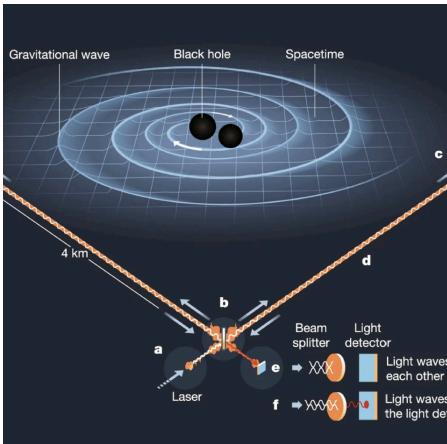
A real figure generally shows some kind of process or phenomenon. There is usually some kind of action.
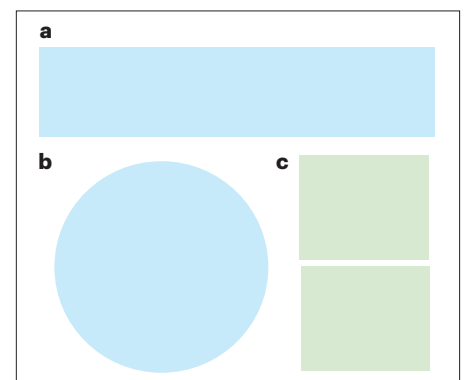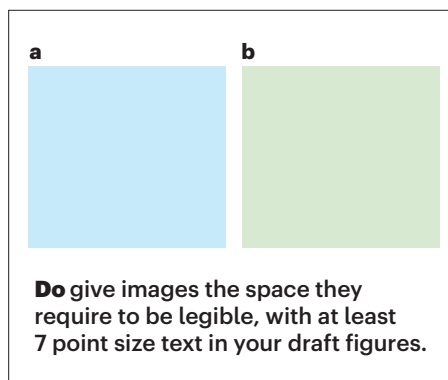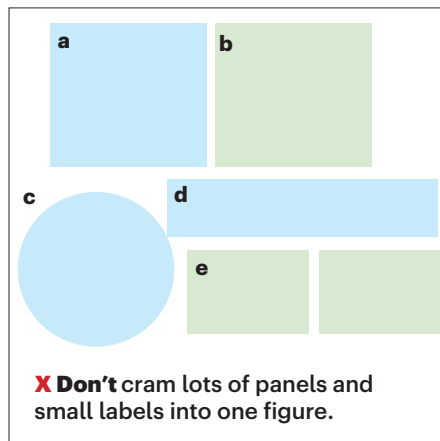

X A 'faux figure' tends to categorise ideas and concepts, and does not show action, often including decorative icons. A simple bulleted list or table is often better for comprehension in these cases.

X Overcrowded figures. Avoid trying to fit too much information into a small space. This causes cognitive overload and reduces comprehension. In addition, labels and images that are too small are not accessible or legible for those with visual impairments.

We have standards for minimum type size and will edit accordingly.

X Don't cram lots of panels and small labels into one figure.

Do give images the space they require to be legible, with at least 7 point size text in your draft figures.

On behalf of the art teams at *Nature* and our portfolio of Nature-branded journals, we thank you and look forward to working with you to create beautiful and enlightening visual content.