

Colorblind Safe Color Schemes

Background:

Why use colorblind safe palettes?

- 8% of men have color vision impairment! Using colorblind friendly colors increases accessibility
- A study of 580 papers in biological sciences found that roughly half had figures that were completely or partially inaccessible for red-green colorblindness (deuteranopia)

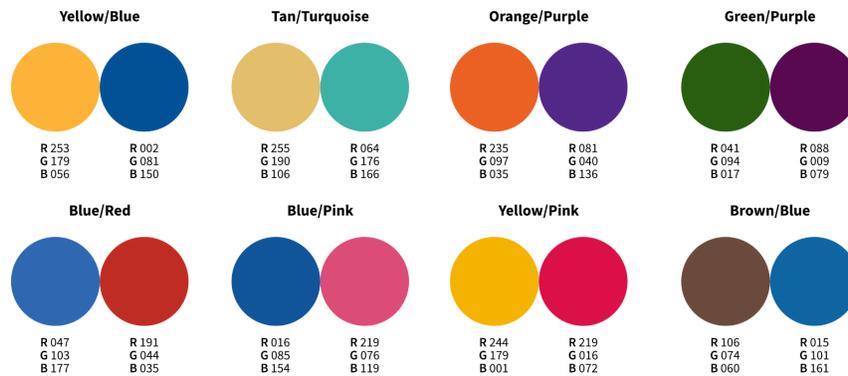
When should you use colorblind safe palettes?

- You should use color blind friendly schemes for all scientific publications
- For artwork, posters, presentations, and more casual science communication, you can try more creative color schemes (see our other [guide](#))

Tips:

1. *Avoid red, especially with green*

- Red-blindness is the most common form of color blindness (deuteranopia)
- If you have to use red/green, try to change brightness/hue
- try blue/red, blue/orange, or one of the sets that I have developed below:

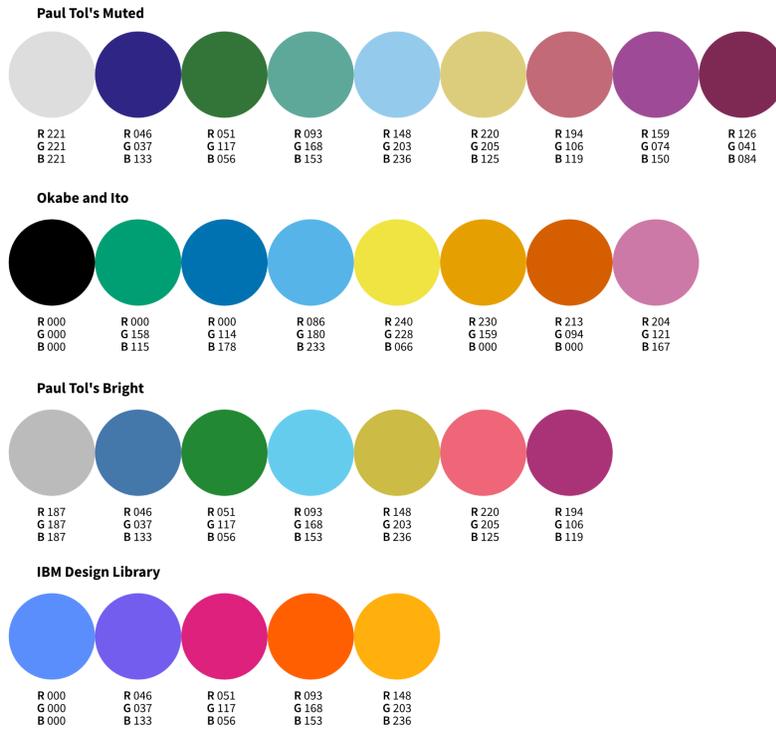


- For divergent schemes try red to blue or purple to green:



2. Use pre-existing colorblind safe palettes

- There are a lot of color schemes out there already that are tested for color blindness - I've compiled my favorites below



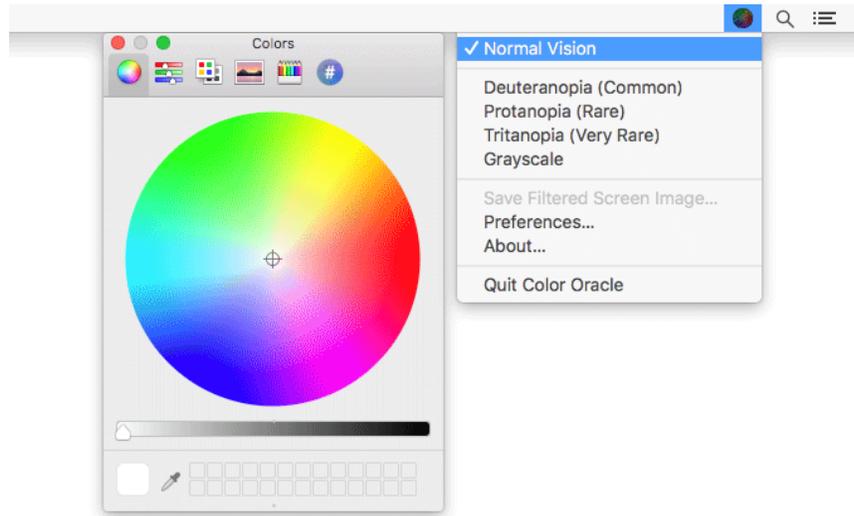
- [ColorBlindness R Package](#): Compilation of >15 color blind safe palettes for plotting and other data visualizations with discrete color palettes

3. Avoid rainbows color maps

- For continuous color maps, try the [Viridis R Package](#), which includes eight perceptually uniform color blind tested options



- For maps where specific colors are needed, like ice cover or oceanographic data, check CMOcean [for MATLAB](#) or [R](#)
4. *Check with colorblind visualization software*
- There are a few options out there, but I prefer [Color Oracle](#), a free color blindness simulator that applies a full screen filter to visualize color blindness and grayscale



5. *Don't rely just on color*
- When possible, avoid conveying information purely through color! Consider varying texture, symbols, typography, or annotation.

References:

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