

COMS30017

Computational Neuroscience

Week 6 / Video 3 / Retina

Dr. Laurence Aitchison

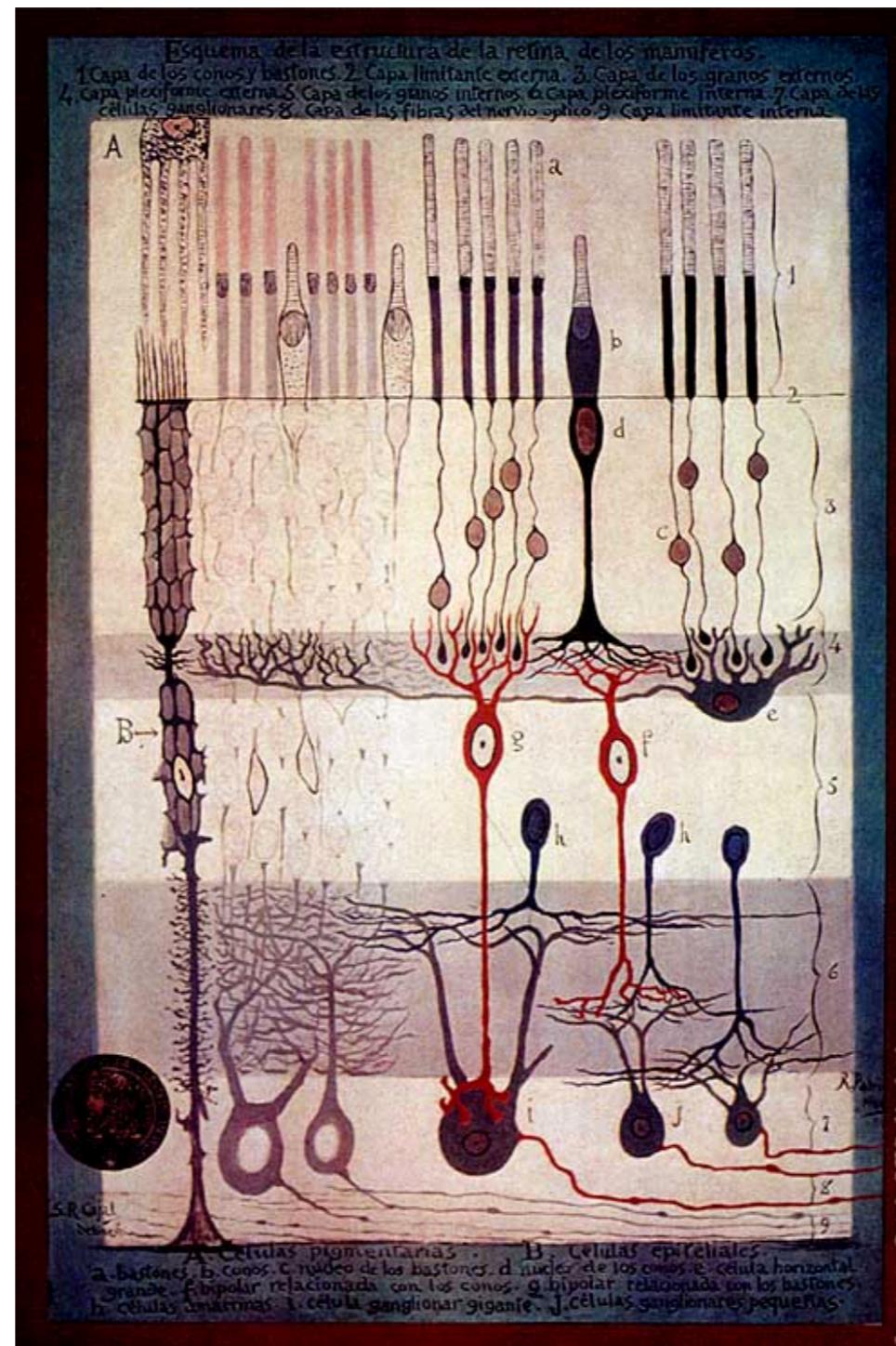
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Intended Learning Outcomes

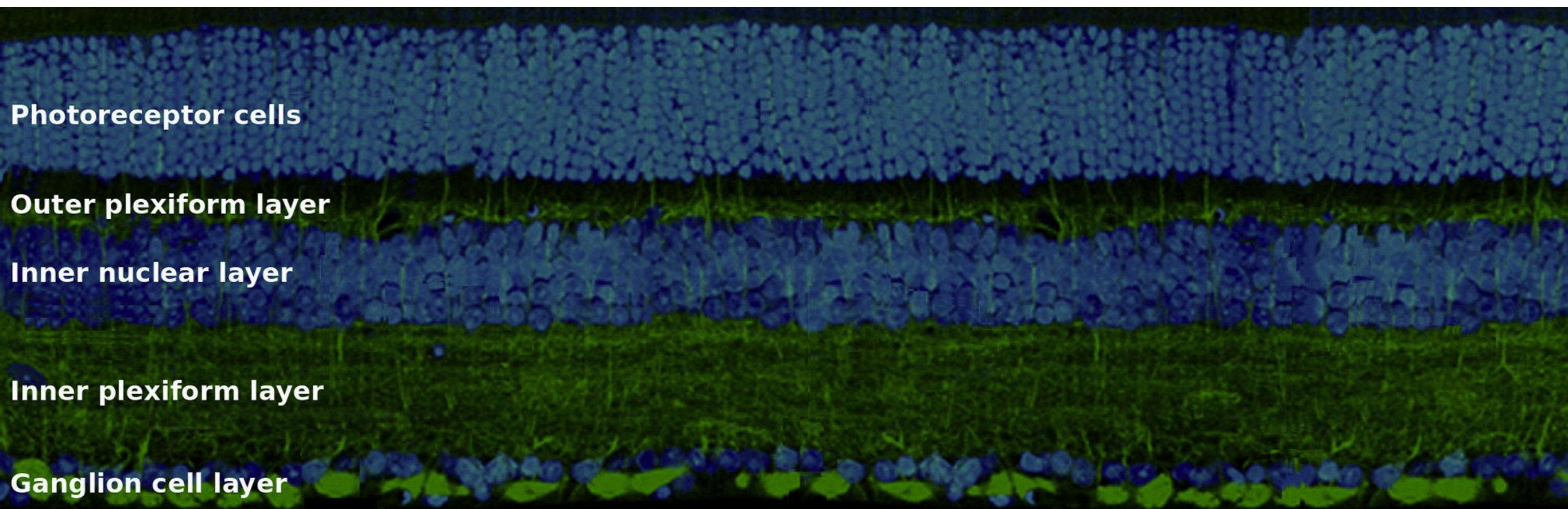
- Retinal microcircuit anatomy
- Retinal color sensitivity

Retinal microcircuit



Ramon y Cajal (c.1900)

Mouse retina (side view)



[Seung and Sümbül, *Neuron* (2014)]

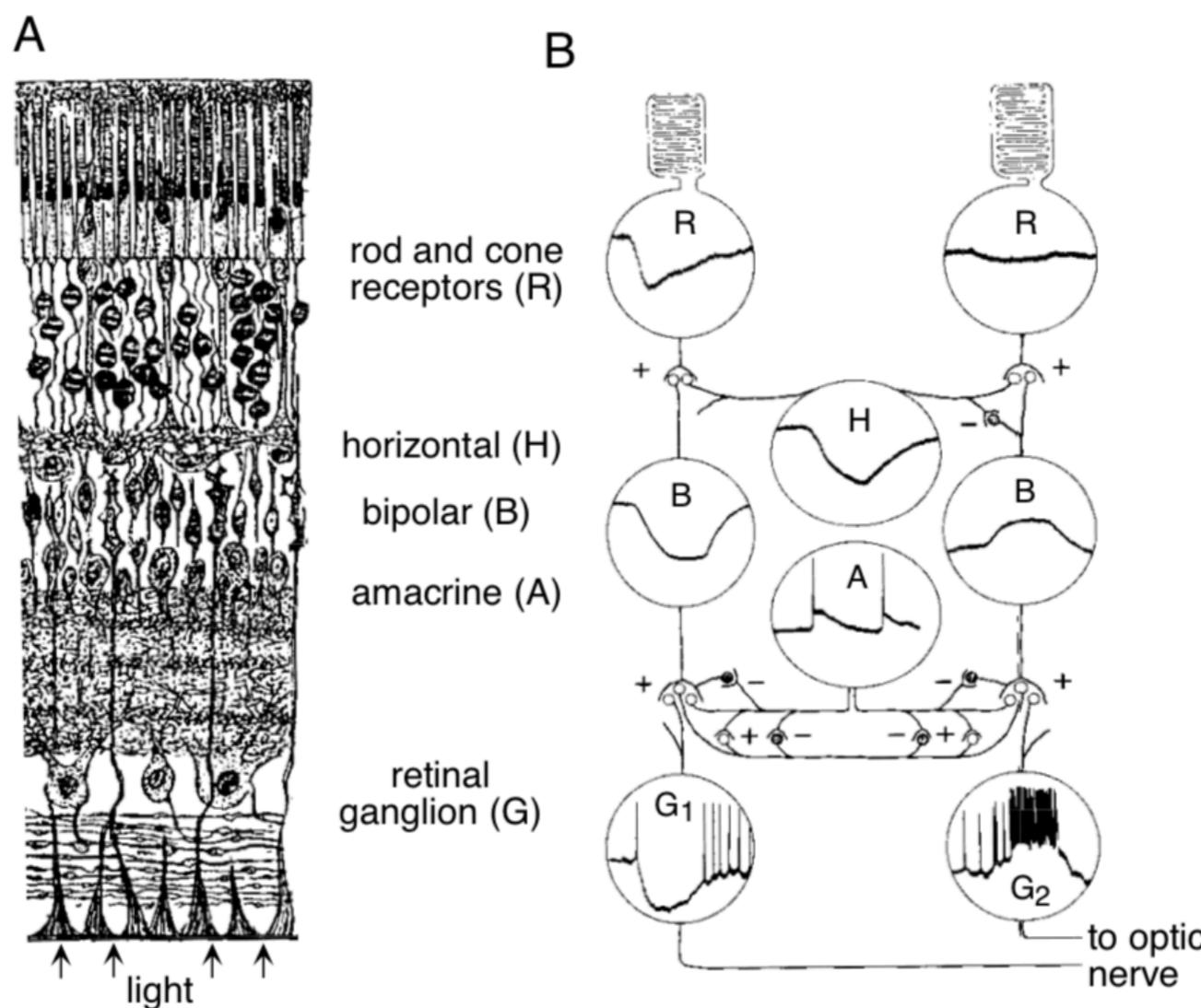
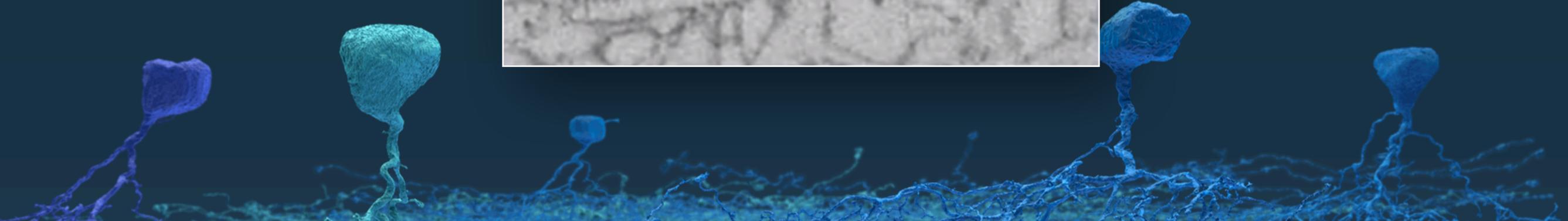
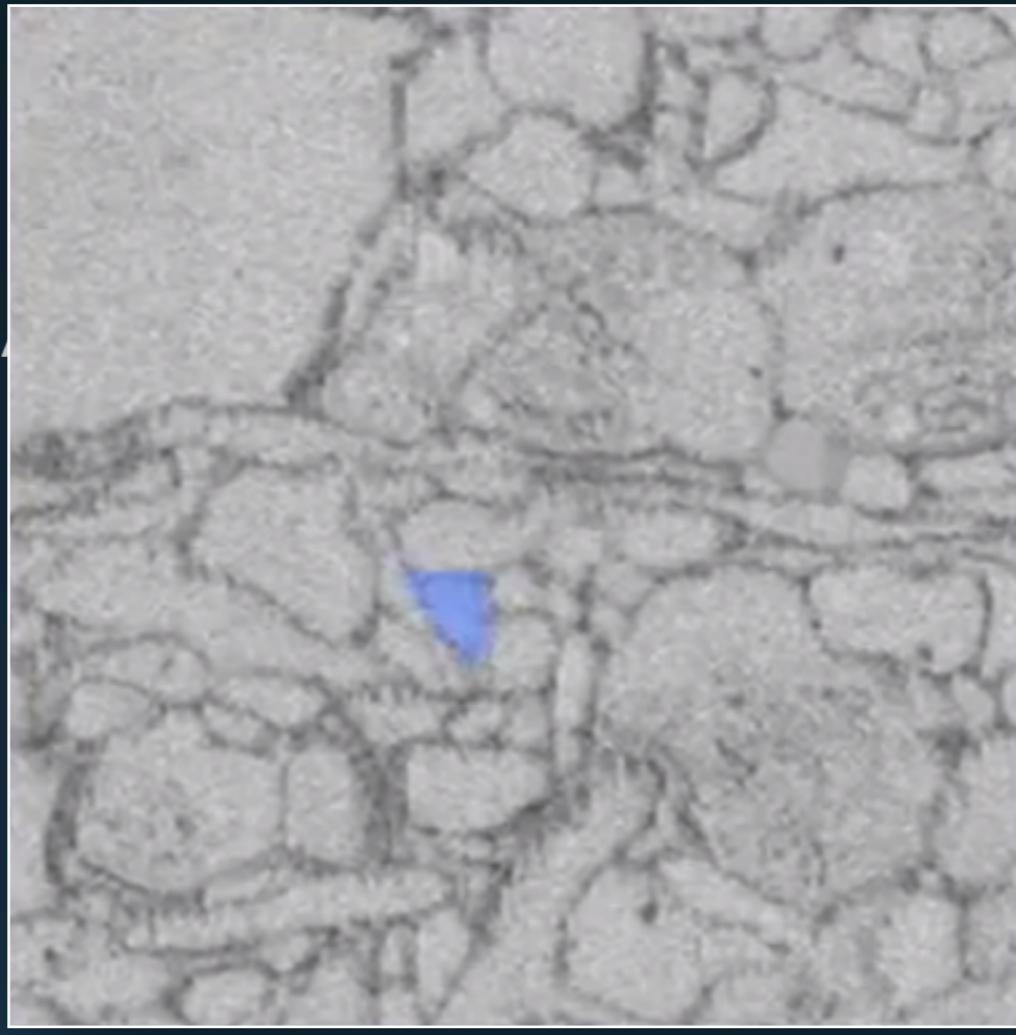
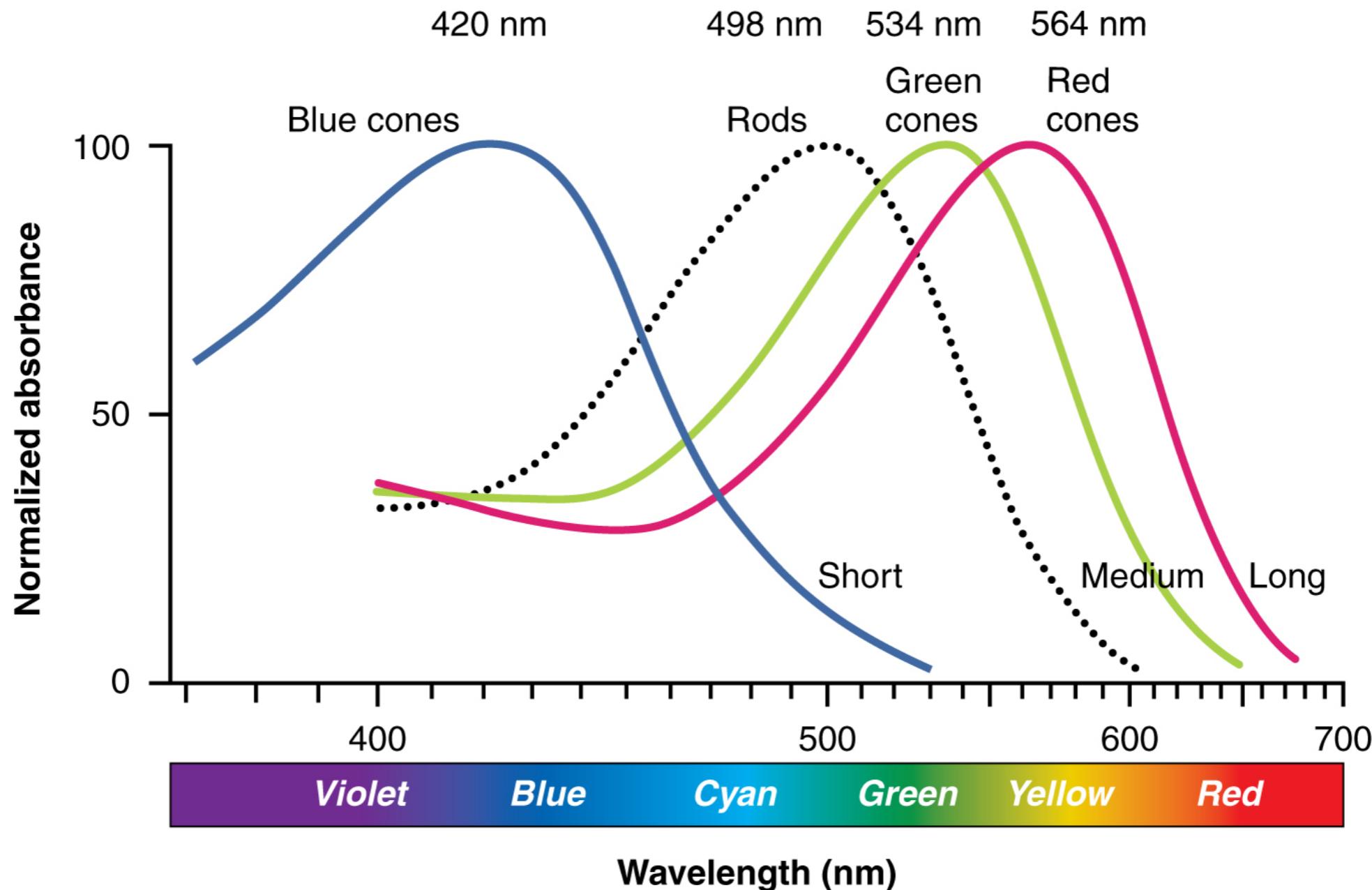


Figure 2.4: A) An anatomical diagram of the circuitry of the retina of a dog. Cell types are identified at right. In the intact eye, illumination is, counter-intuitively, from the bottom of this figure. B) Intracellular recordings from retinal neurons of the mudpuppy responding to flash of light lasting for one second. In the column of cells on the left side of the diagram, the resulting hyperpolarizations are about 4 mV in the rod and retinal ganglion cells, and 8 mV in the bipolar cell. Pluses and minuses represent excitatory and inhibitory synapses respectively. (A adapted from Nicholls et al., 1992; drawing from Cajal, 1911. B data from Werblin and Dowling 1969; figure adapted from Dowling, 1992.)

eyewire.org



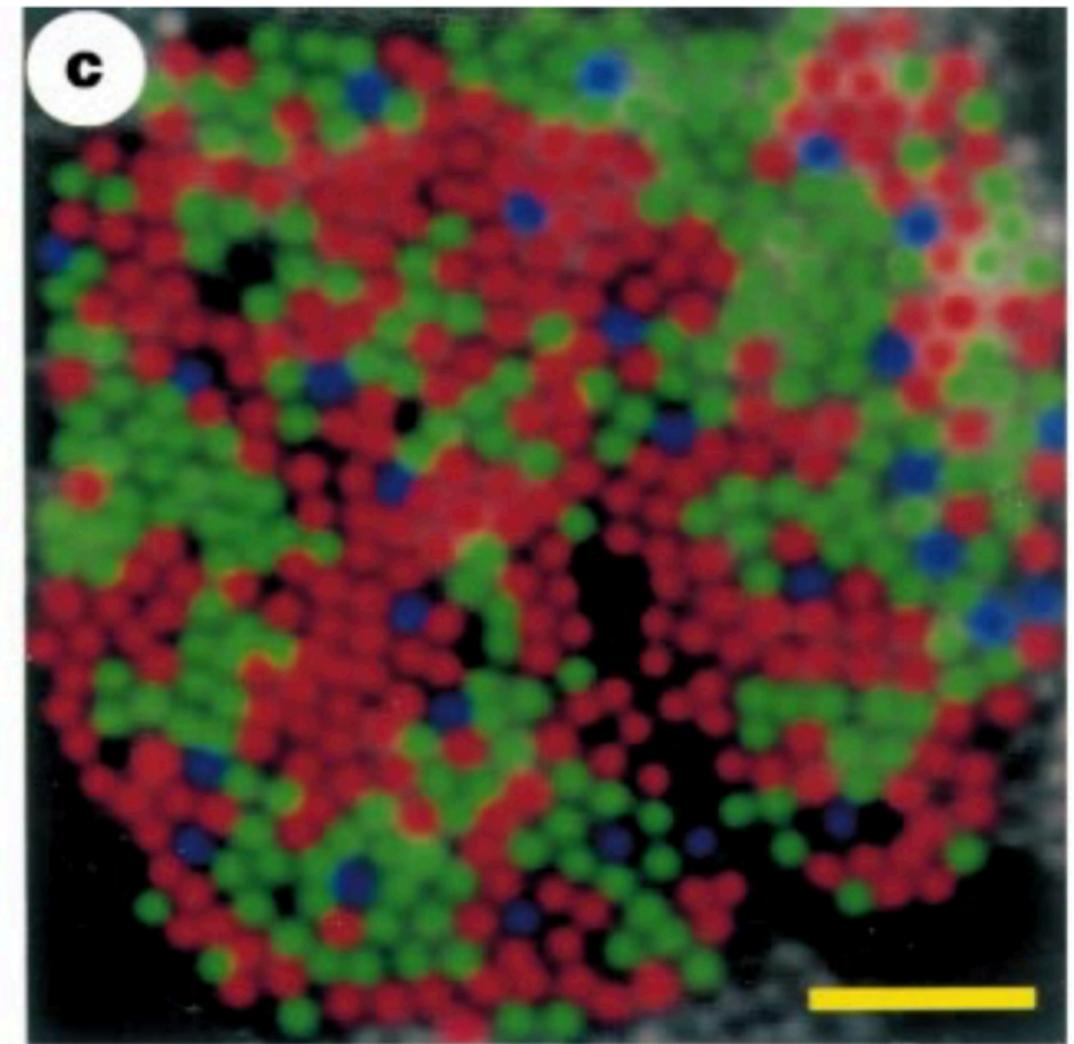
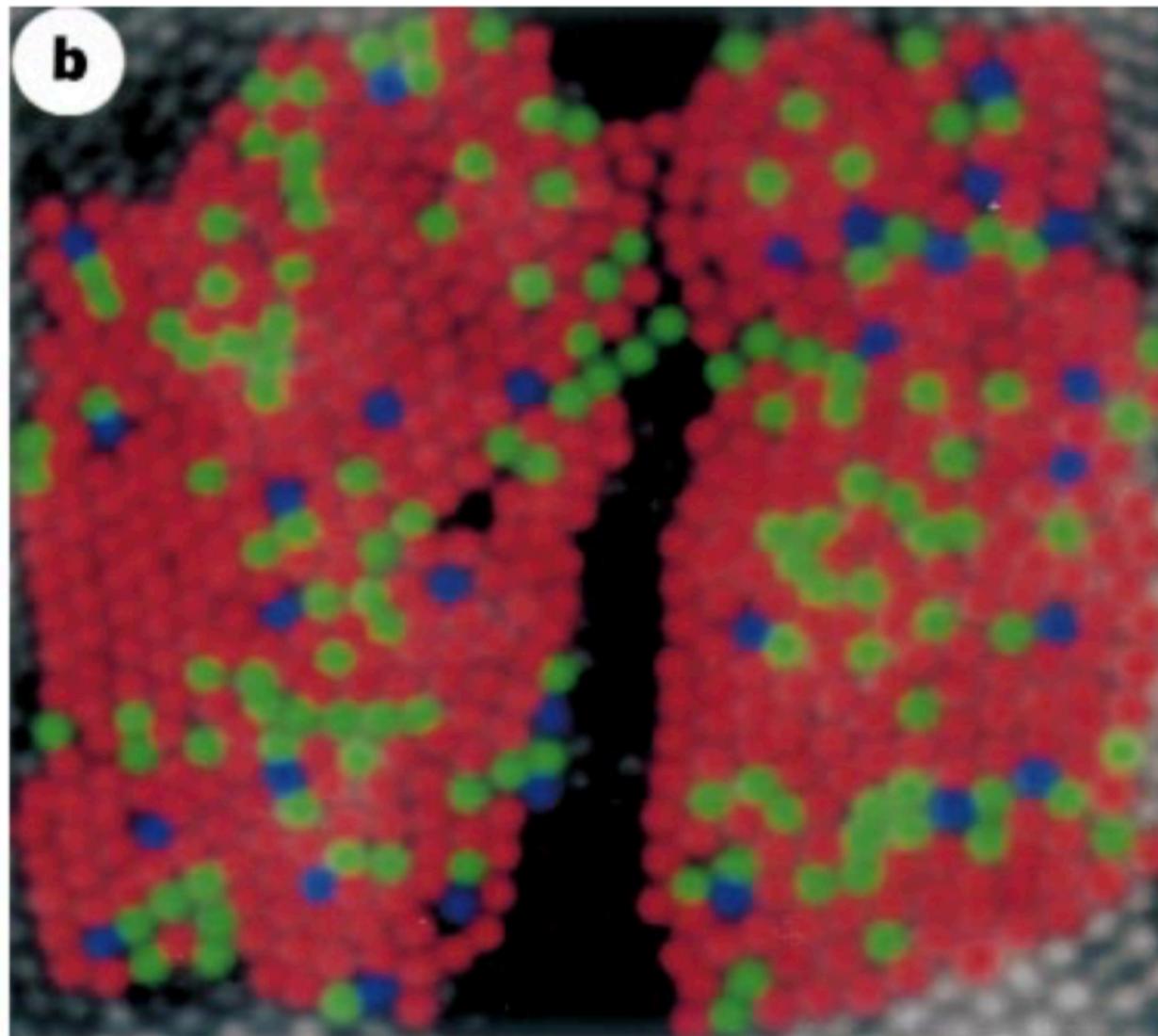
Colour sensitivity in the retina



https://en.wikipedia.org/wiki/Photoreceptor_cell#/media/File:1416_Color_Sensitivity.jpg

[Bowmaker and Dartnall, *J Physiol* (1990)]

Colour sensitivity in the retina



[Roorda and Williams, *Nature* (1999)]

End