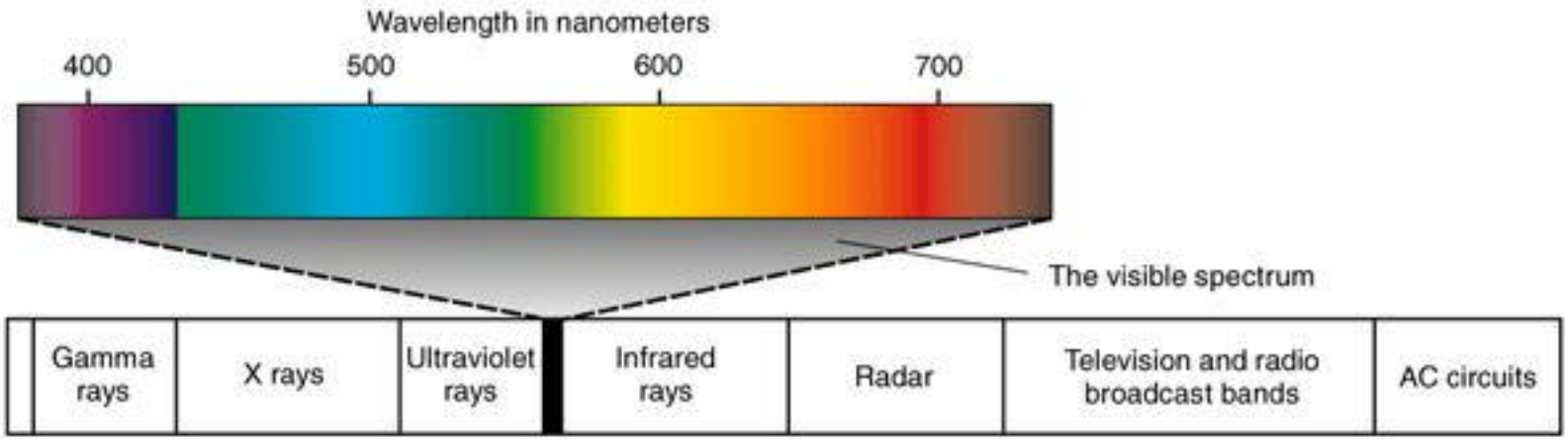
ALLYN AND BACON

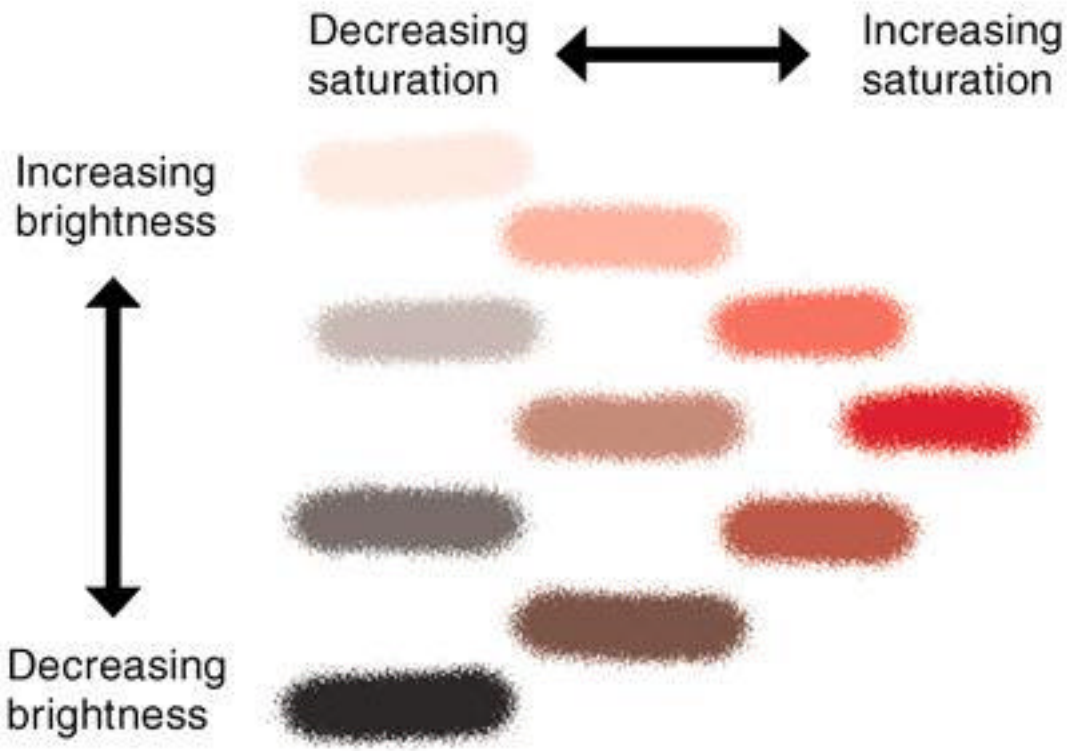
for Physiology of Behavior
by Neil R. Carlson *Seventh Edition*

CHAPTER 6
Vision

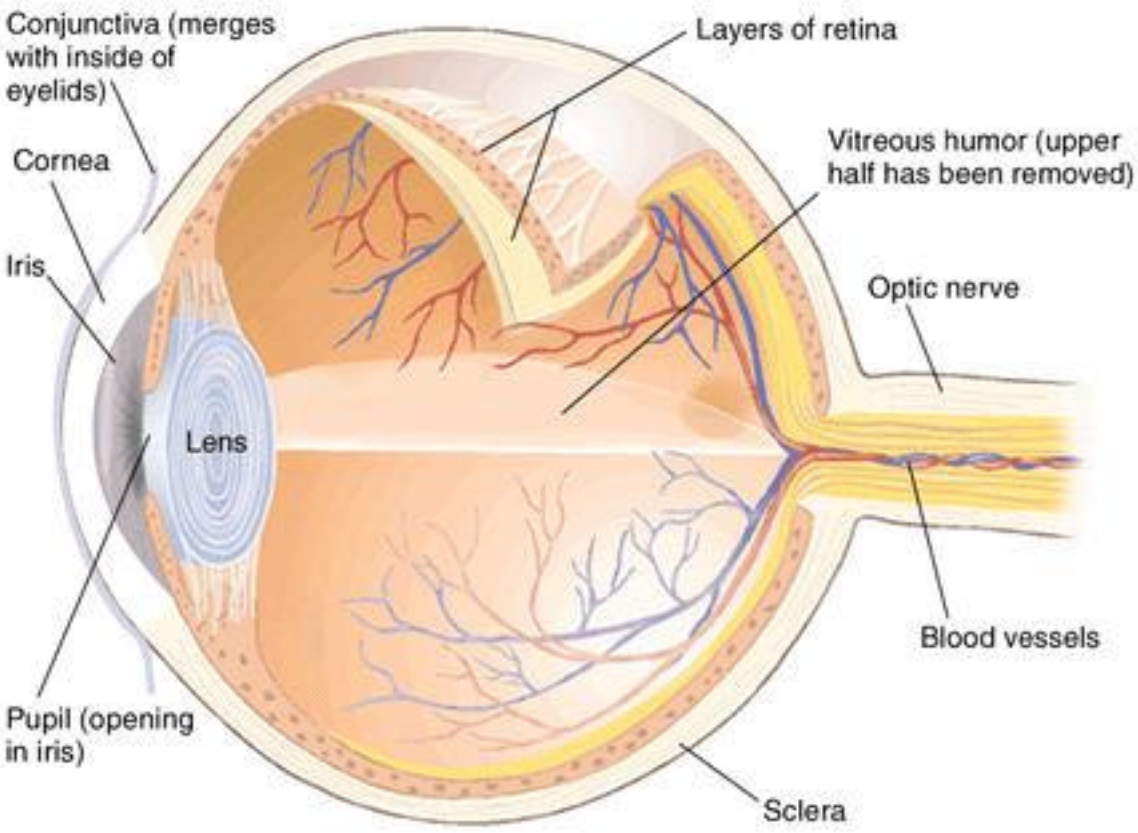
► The Electromagnetic Spectrum



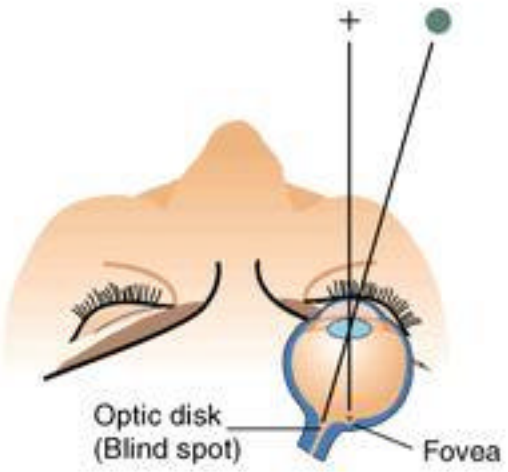
- **Examples of Colors with the Same Dominant Wavelength but Different Levels of Saturation and Brightness**



► The Human Eye



► Test for the Blind Spot



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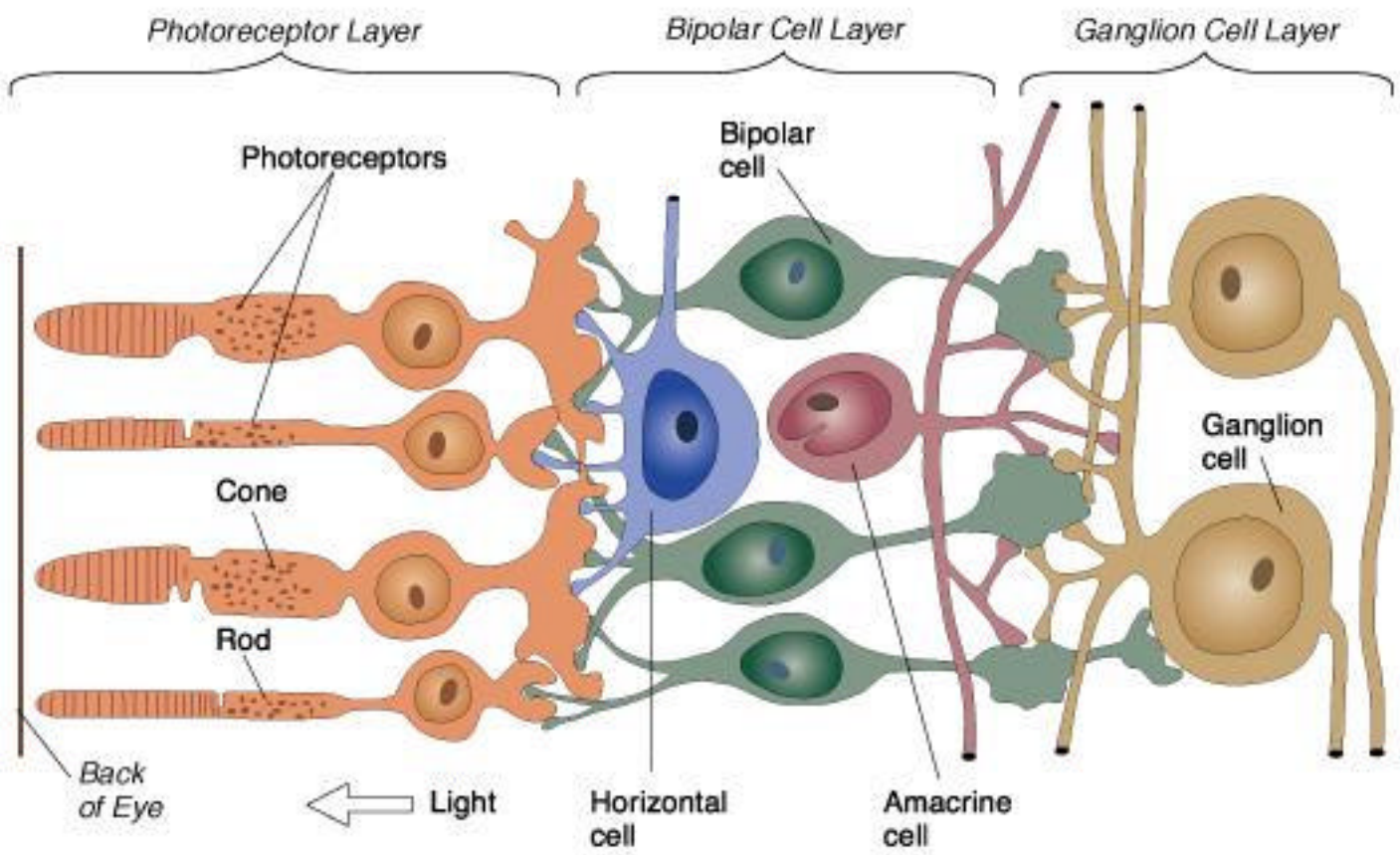
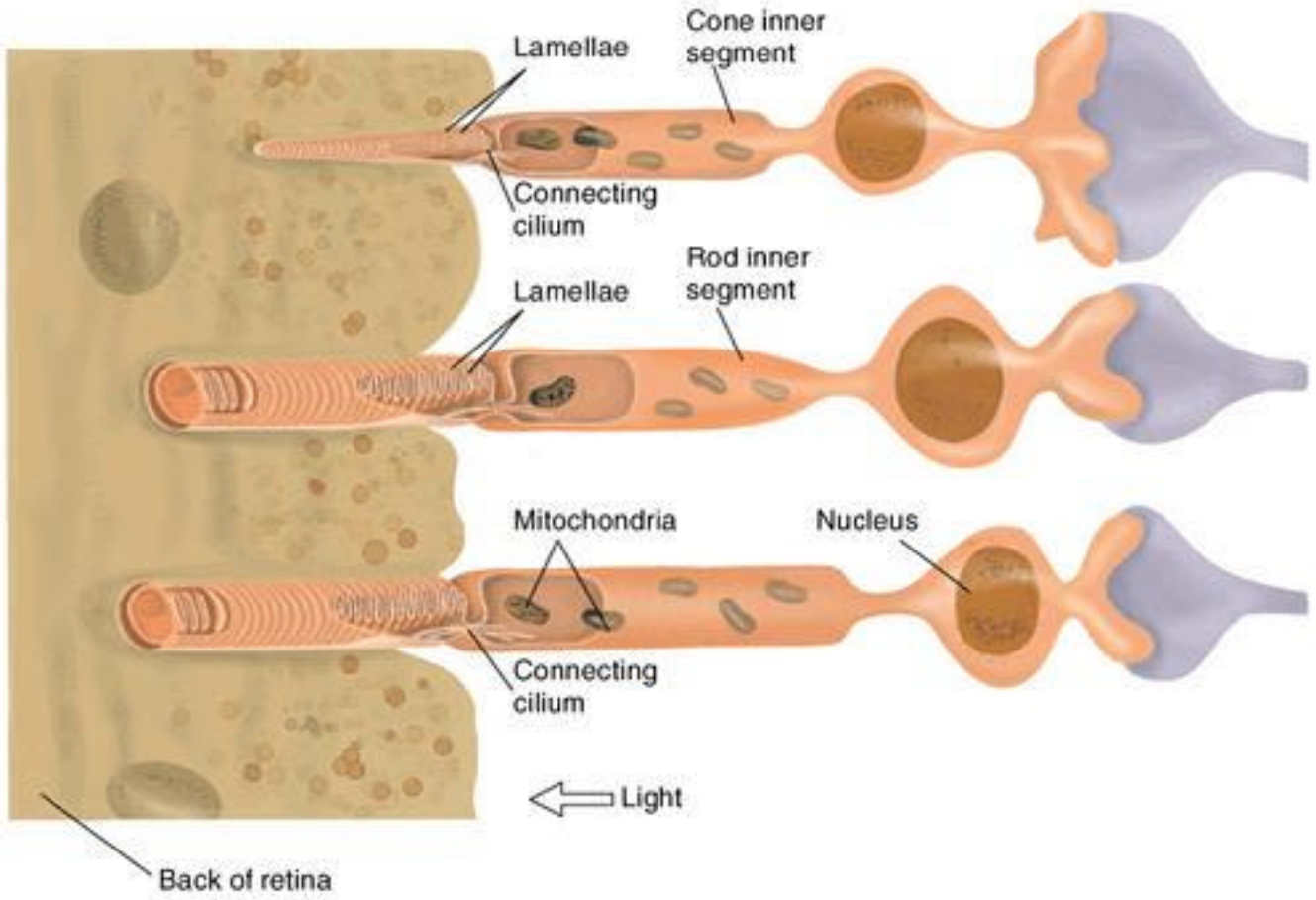
▶ Details of Retinal Circuitry

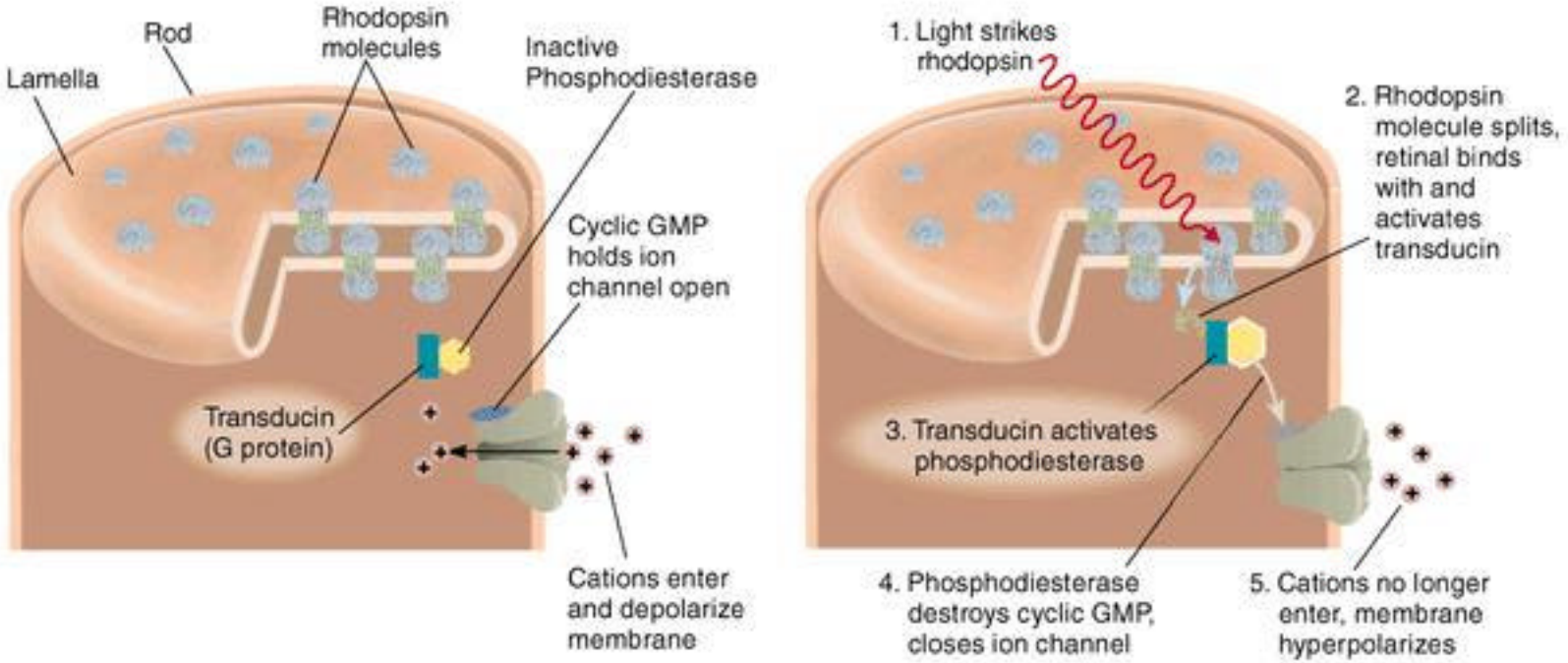


Source: Adapted from Dowling, J.E., and Boycott, B.B. Proceedings of the Royal Society of London, B., 1966, 166, 80-111

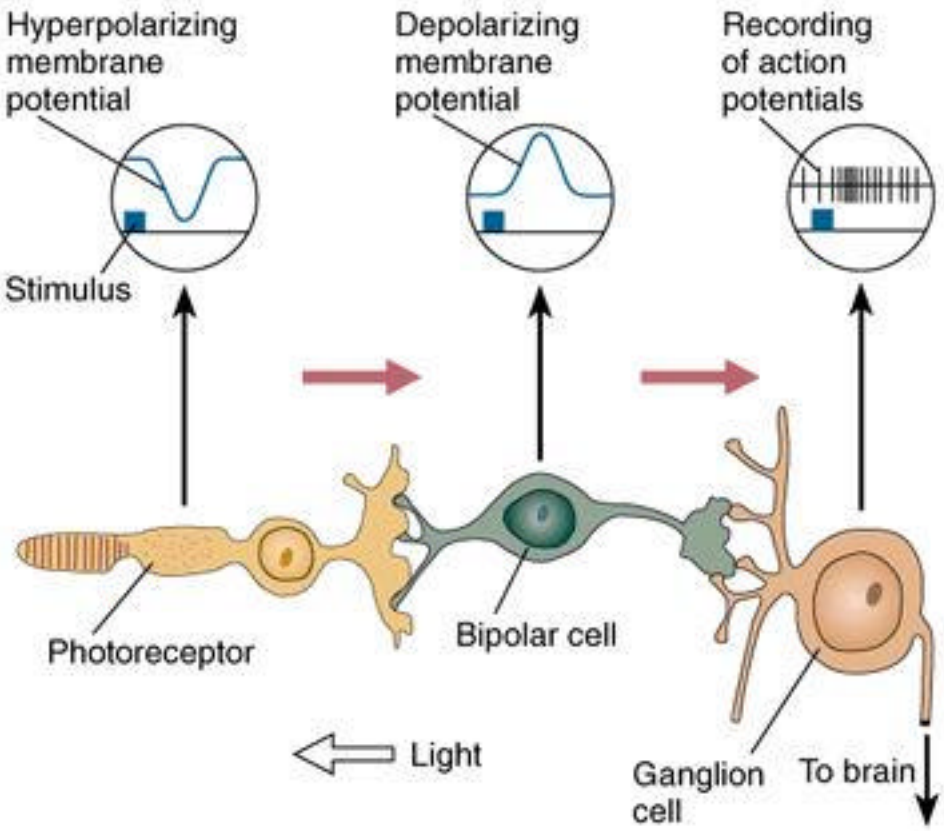
► Photoreceptors



► Transduction

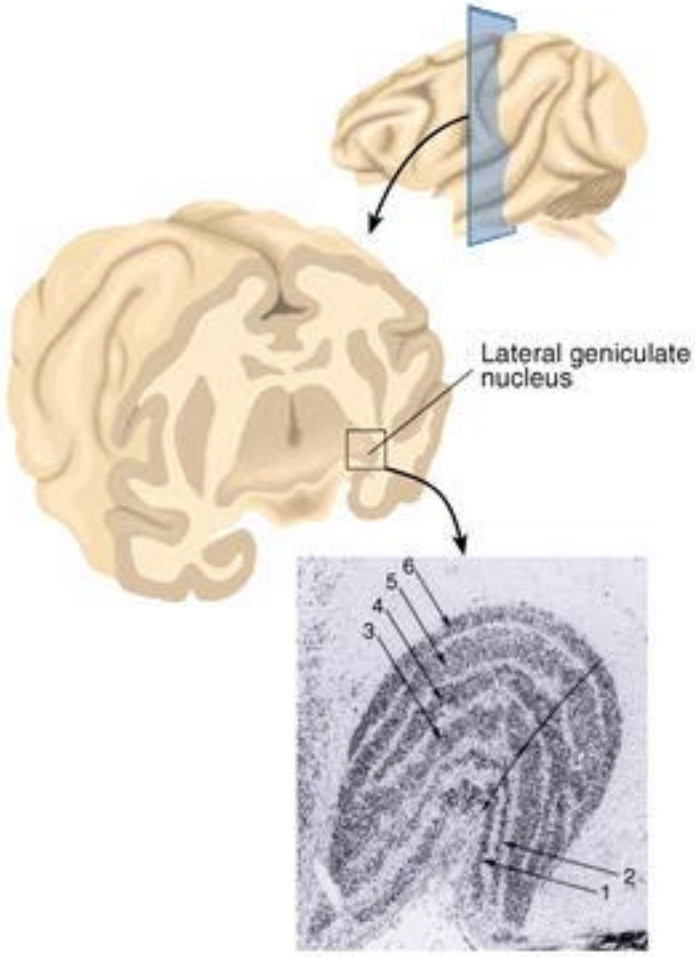


► Neural Circuitry in the Retina



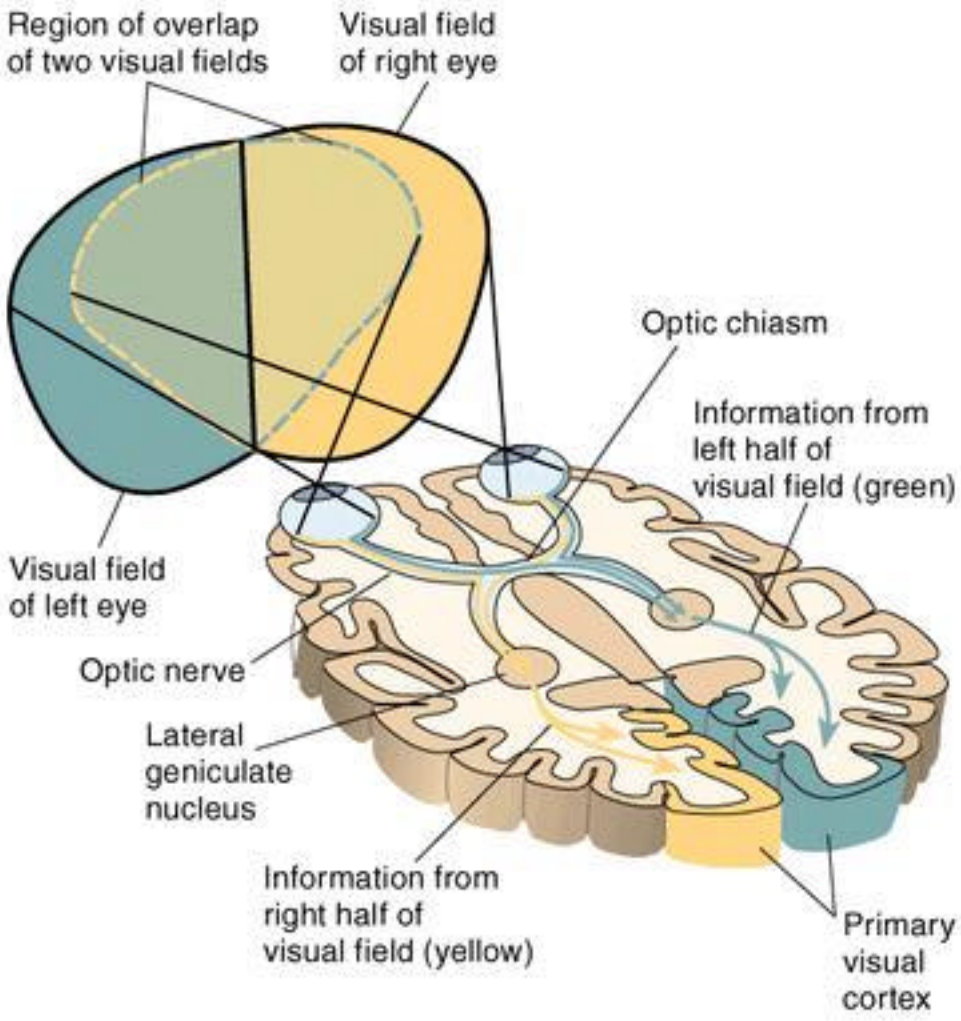
Source: Adapted from Dowling, J.E., in *The Neurosciences: Fourth Study Program*, edited by F.O. Schmitt and F.G. Worden. Cambridge, Mass.: MIT Press, 1979.

► A Photomicrograph of a Section Through the Right Lateral Geniculate Nucleus of a Rhesus Monkey

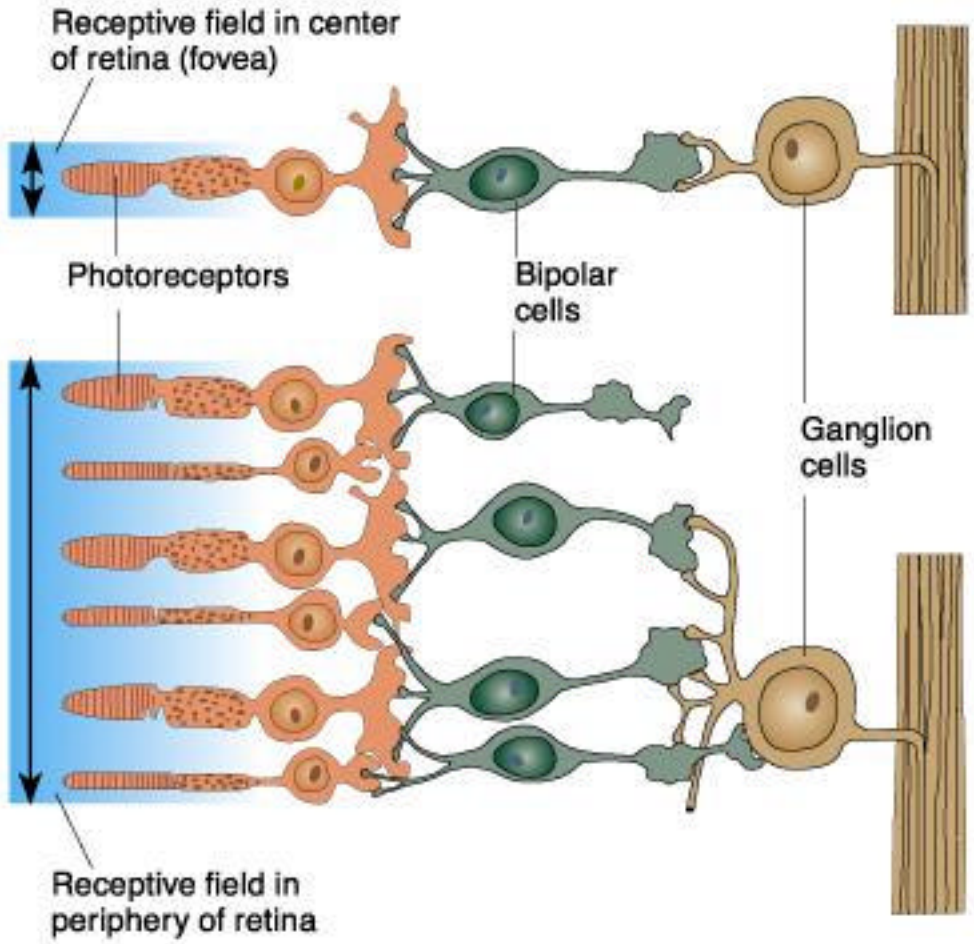


Source: From Hubel, D.H., Wiesel, T.N., and Le Vay, S. *Philosophical Transactions of the Royal Society of London, B.*, 1977, *278*, 131–163.

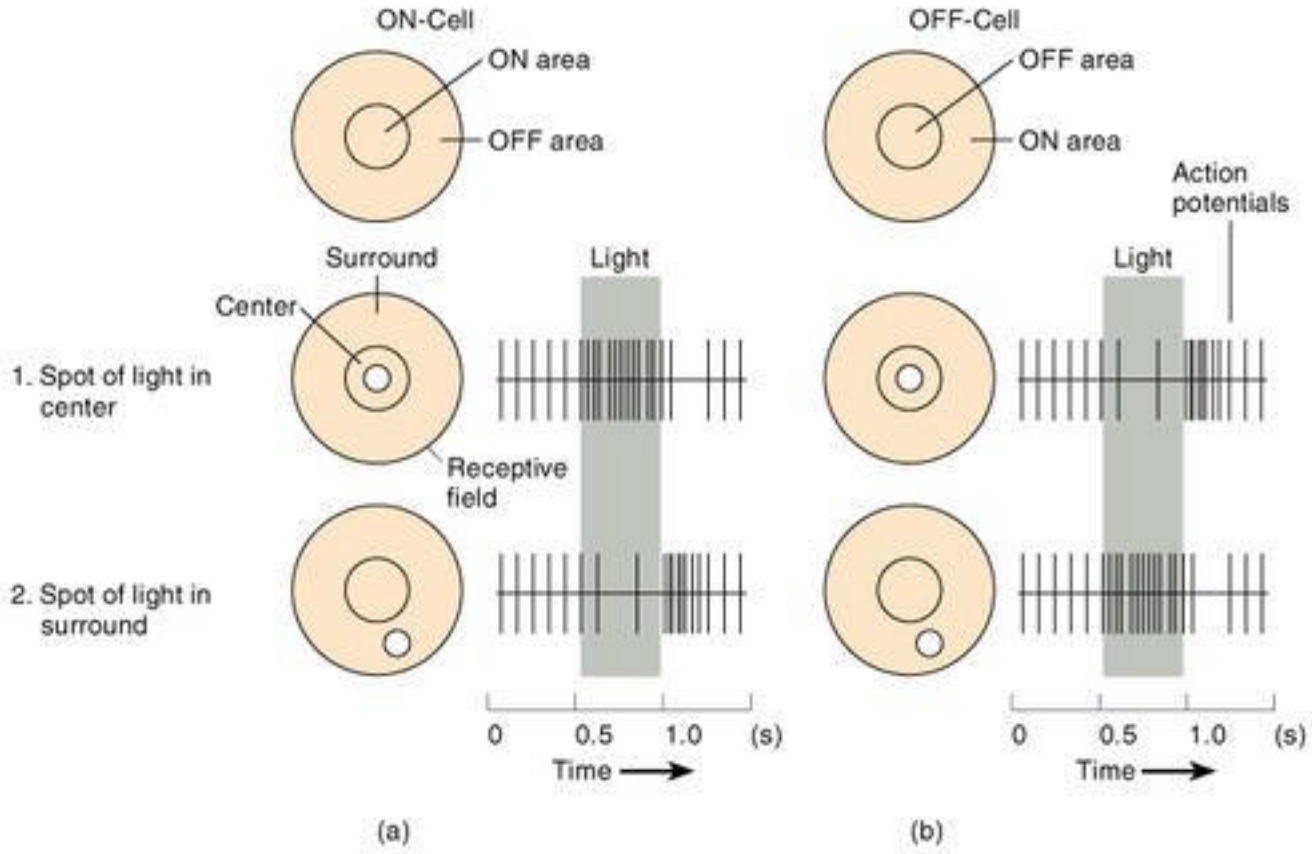
► The Primary Visual Pathway



▶ Central vs. Peripheral Acuity

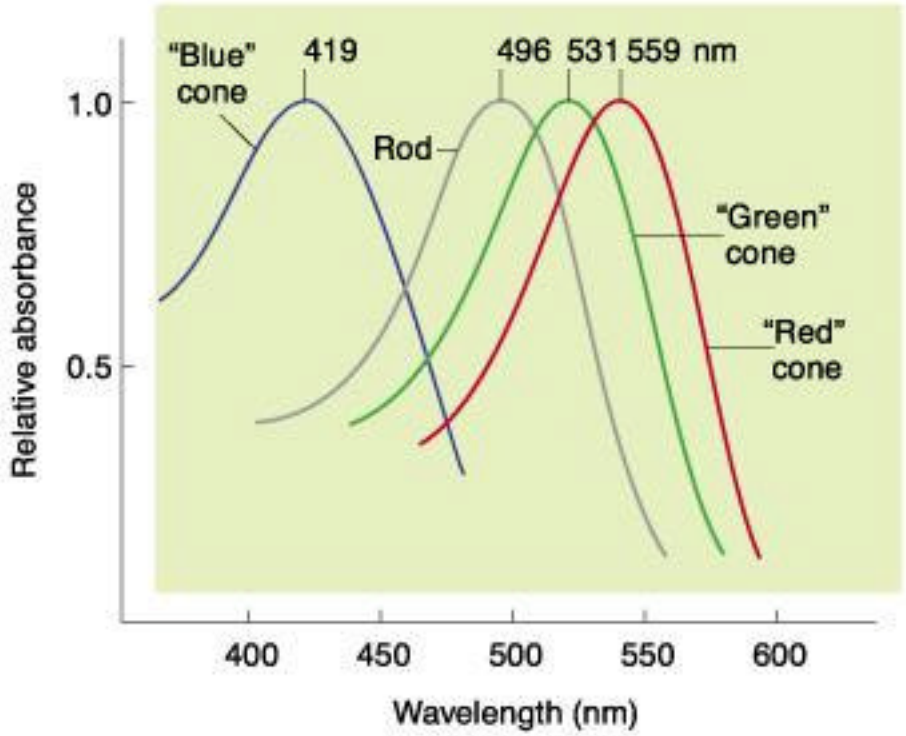


► Responses of ON and OFF Ganglion Cells to Stimuli Presented in the Center or the Surround of the Receptive Field



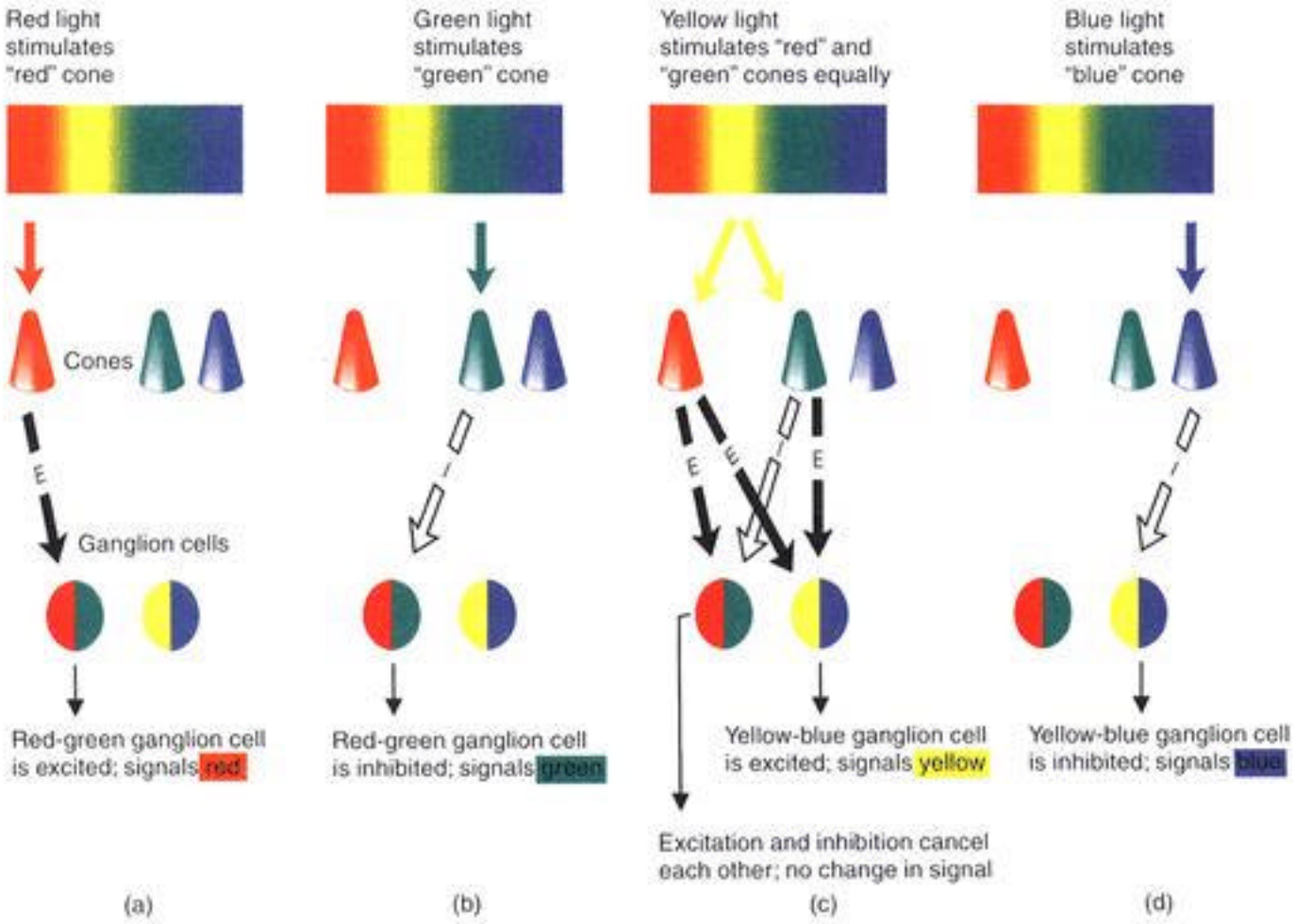
Source: Adapted from Kuffler, S.W. *Cold Spring Harbor Symposium for Quantitative Biology*, 1952, *17*, 281–292.

► Relative Absorbance of Light of Various Wavelengths by Rods and the Three Types of Cones in the Human Retina

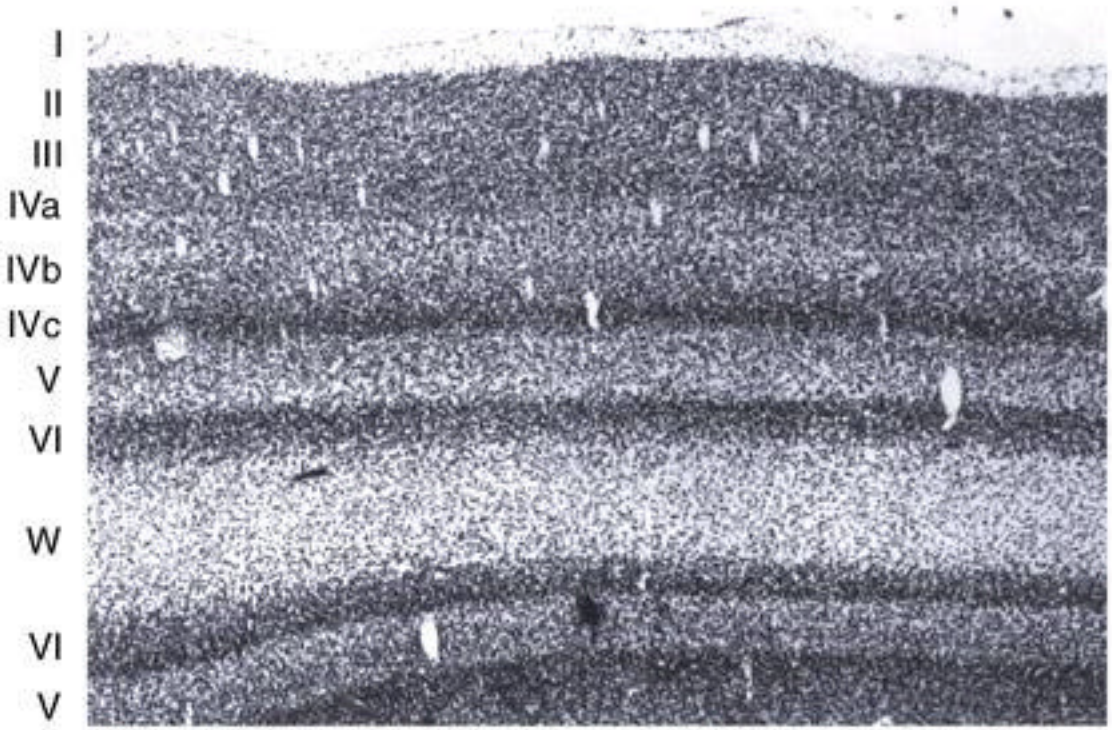


Source: Dartnall, H.J.A., Bowmaker, J.K., and Mollon, J.D. Human visual pigments: Microspectrophotometric results from the eyes of seven persons. Proceedings of the Royal Society of London, B., 1983, 220, 115-130.

► Color Coding in the Retina

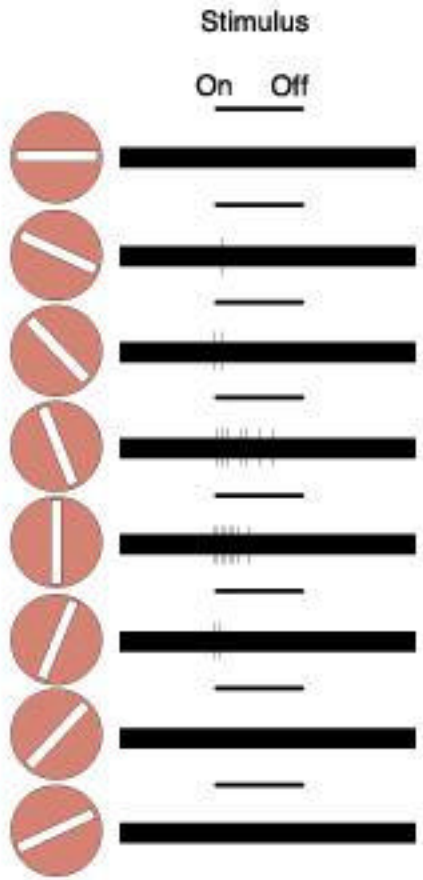


► A Photomicrograph of a Small Section of Striate Cortex



Source: From Hubel, D.H., and Wiesel, T.N. *Proceedings of the Royal Society of London, B.*, 1977, *198*, 1-59.

▶ Orientation Sensitivity



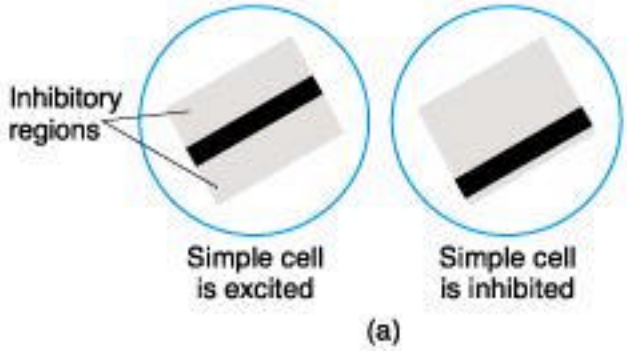
Source: Adapted from Hubel, D.H., and Wiesel, T.N. Journal of Physiology (London), 1959, 148, 574-591.

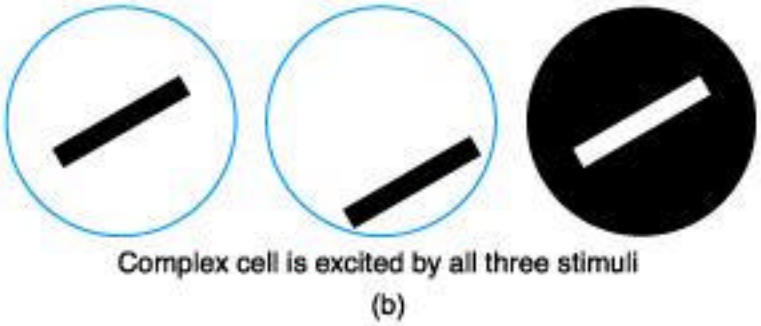
▶ Response Characteristics of Neurons to Orientation in the Primary Visual Cortex

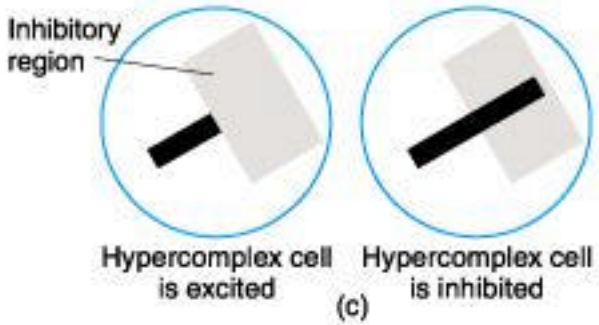
(a) Simple Cell

(b) Complex Cell

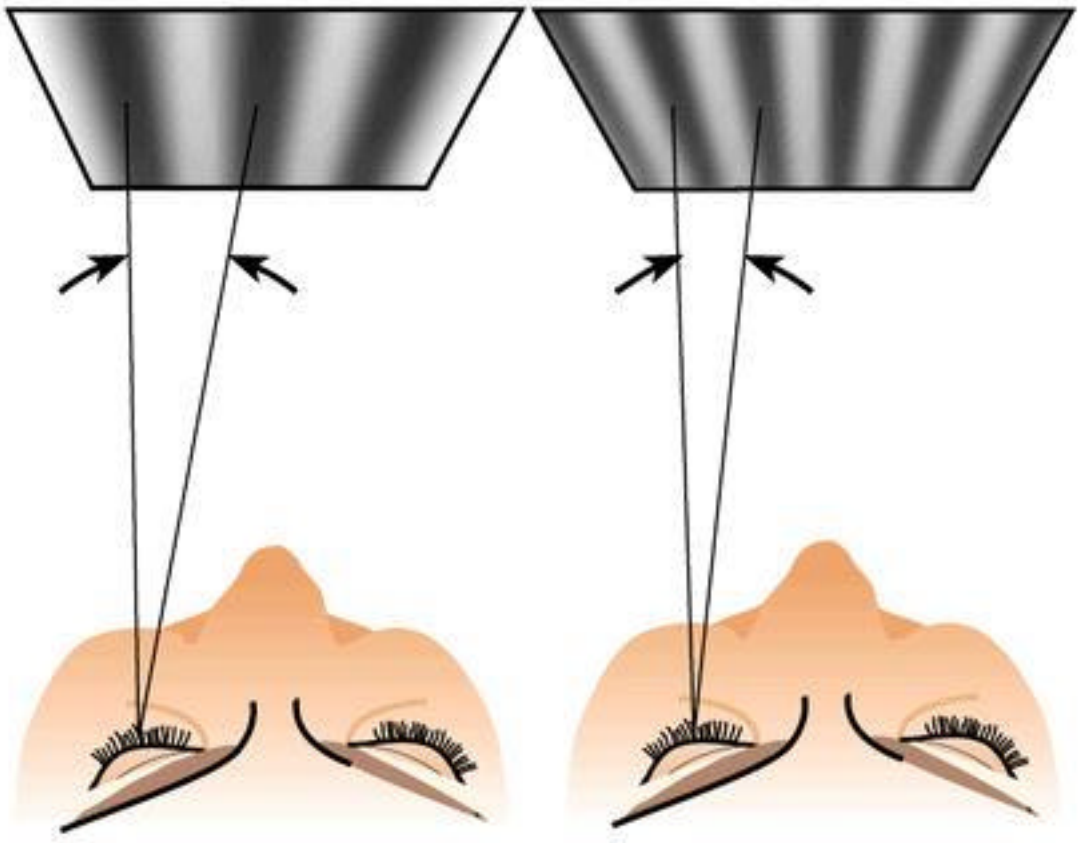
(c) Hypercomplex Cell



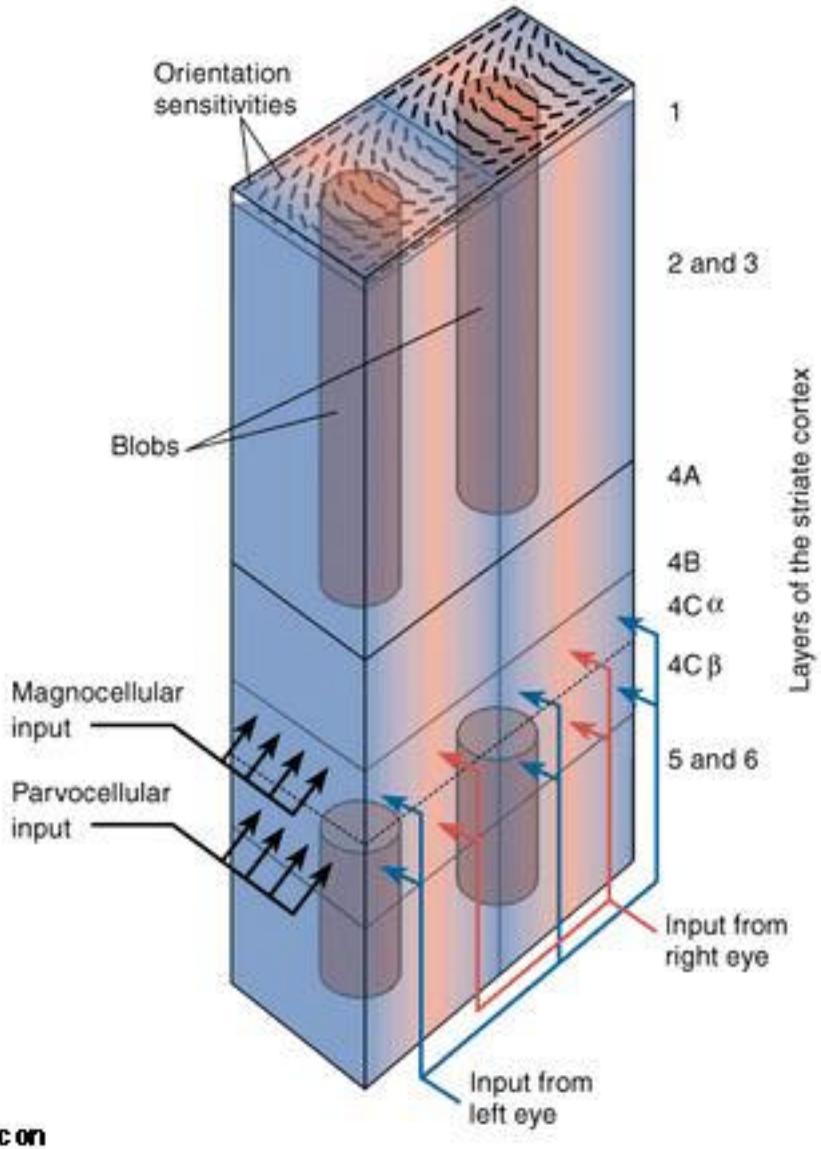




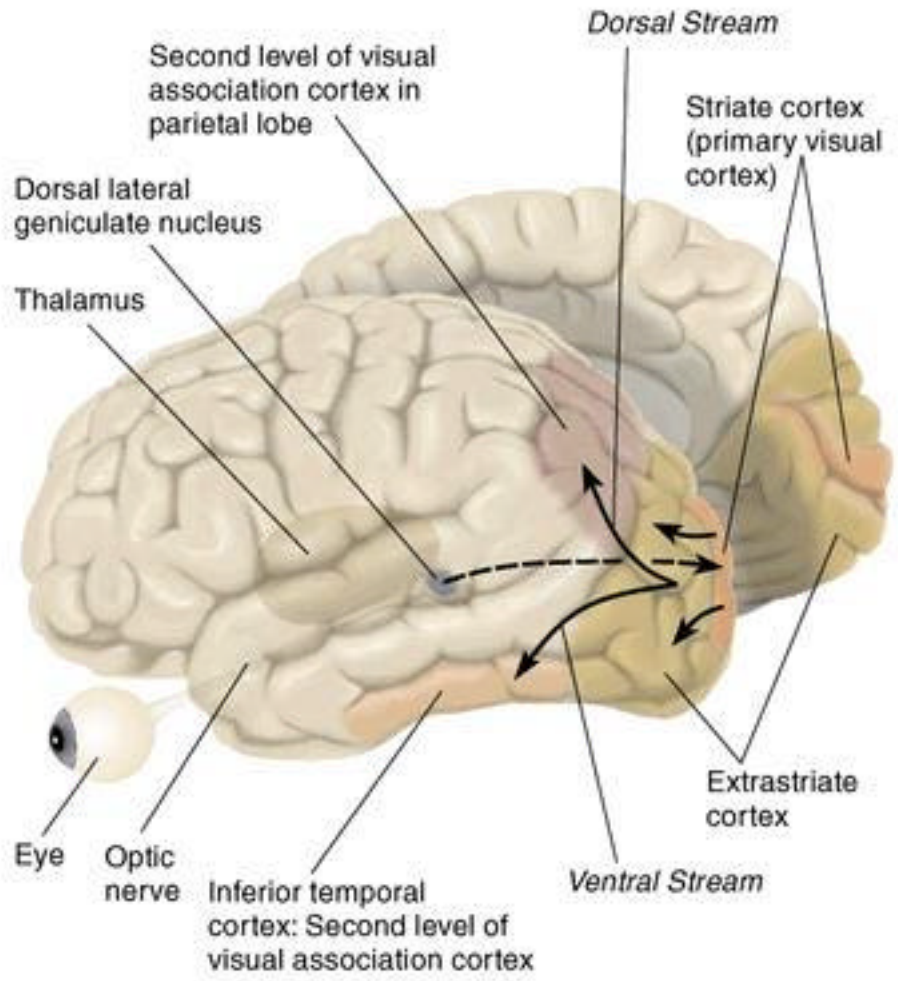
► Concepts of Visual Angle and Spatial Frequency



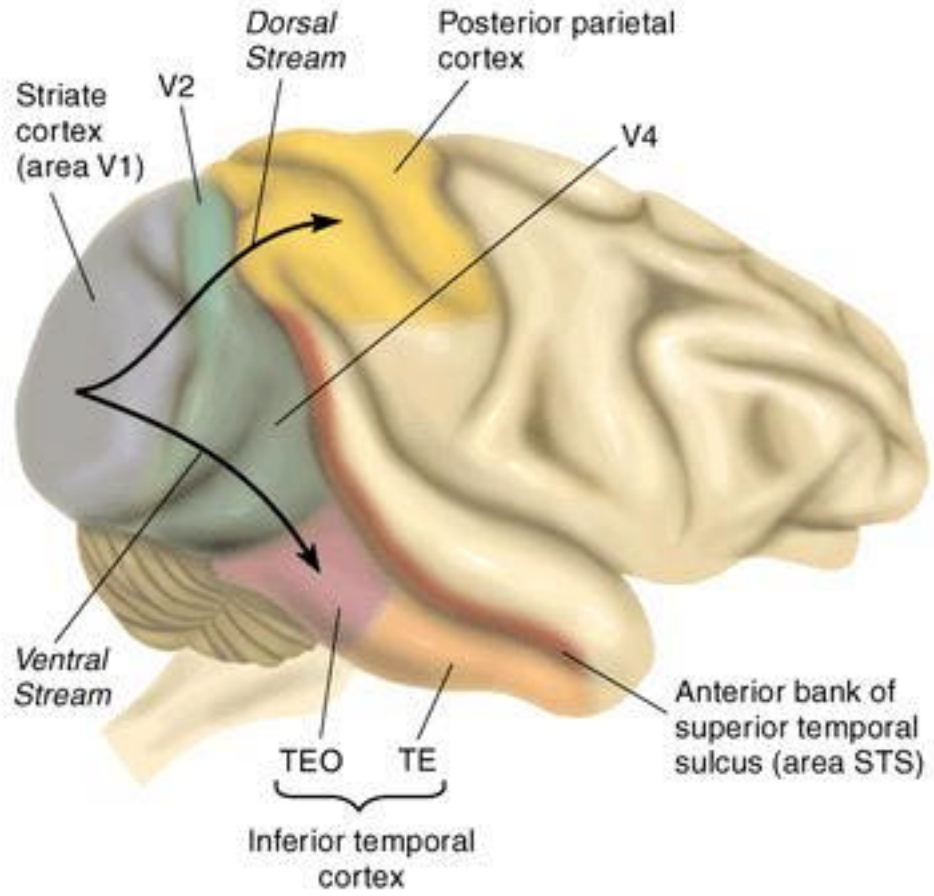
► One of the Modules of the Primary Visual Cortex



► The Human Visual System

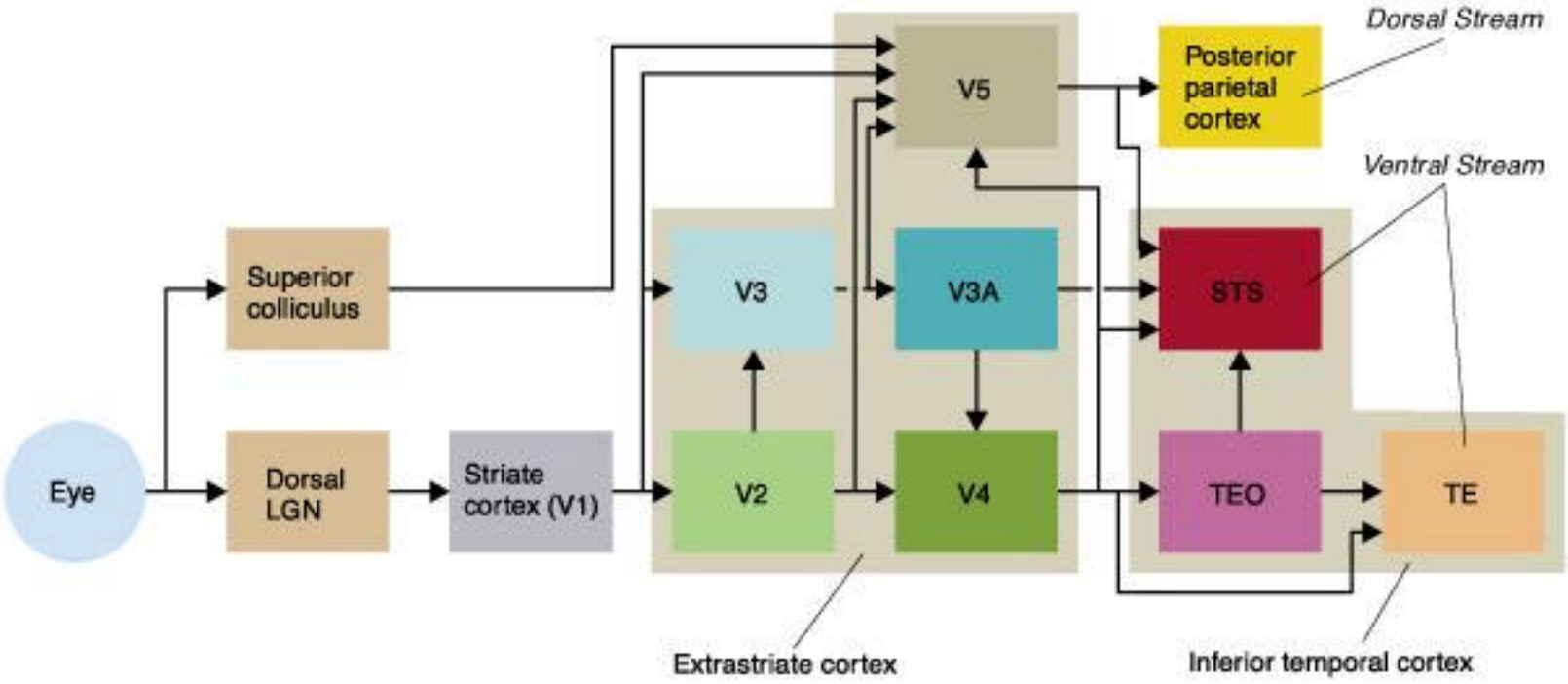


► Areas of Visual Cortex in the Rhesus Monkey Brain

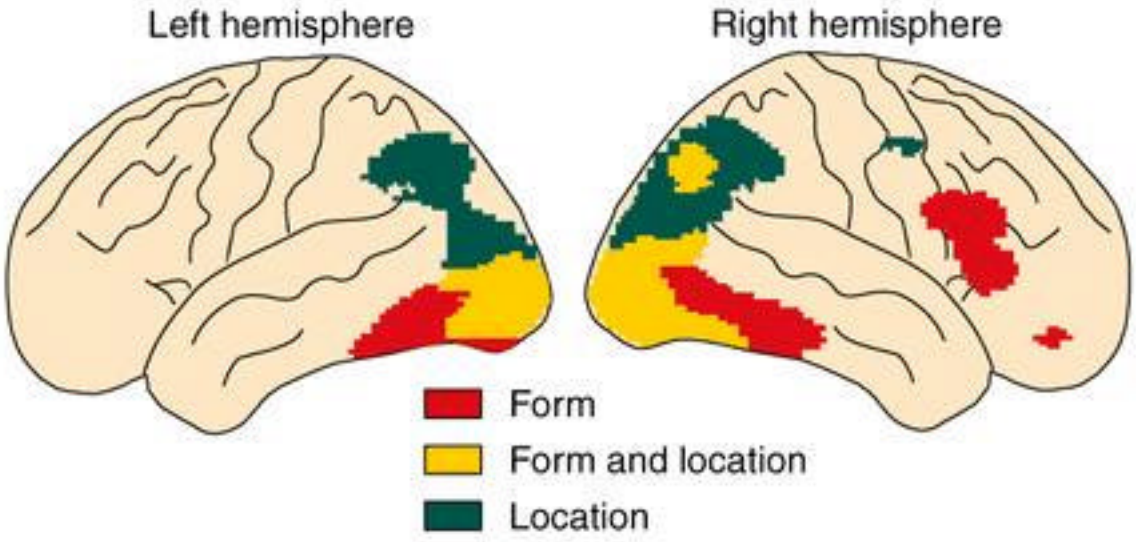


Source: Adapted from Zeki, S.M. *Journal of Physiology*, 1978, *277*, 227–244.

▶ Interconnections of Areas of Visual Cortex in the Rhesus Monkey Brain



► Responses to Objects and Location



Source: Adapted from Haxby, J.V., Horwitz, B., Underleider, L.G., Maisog, J.M., Pietrini, P., and Grady, C.L. *Journal of Neuroscience*, 1994, *14*, 6336–6353.