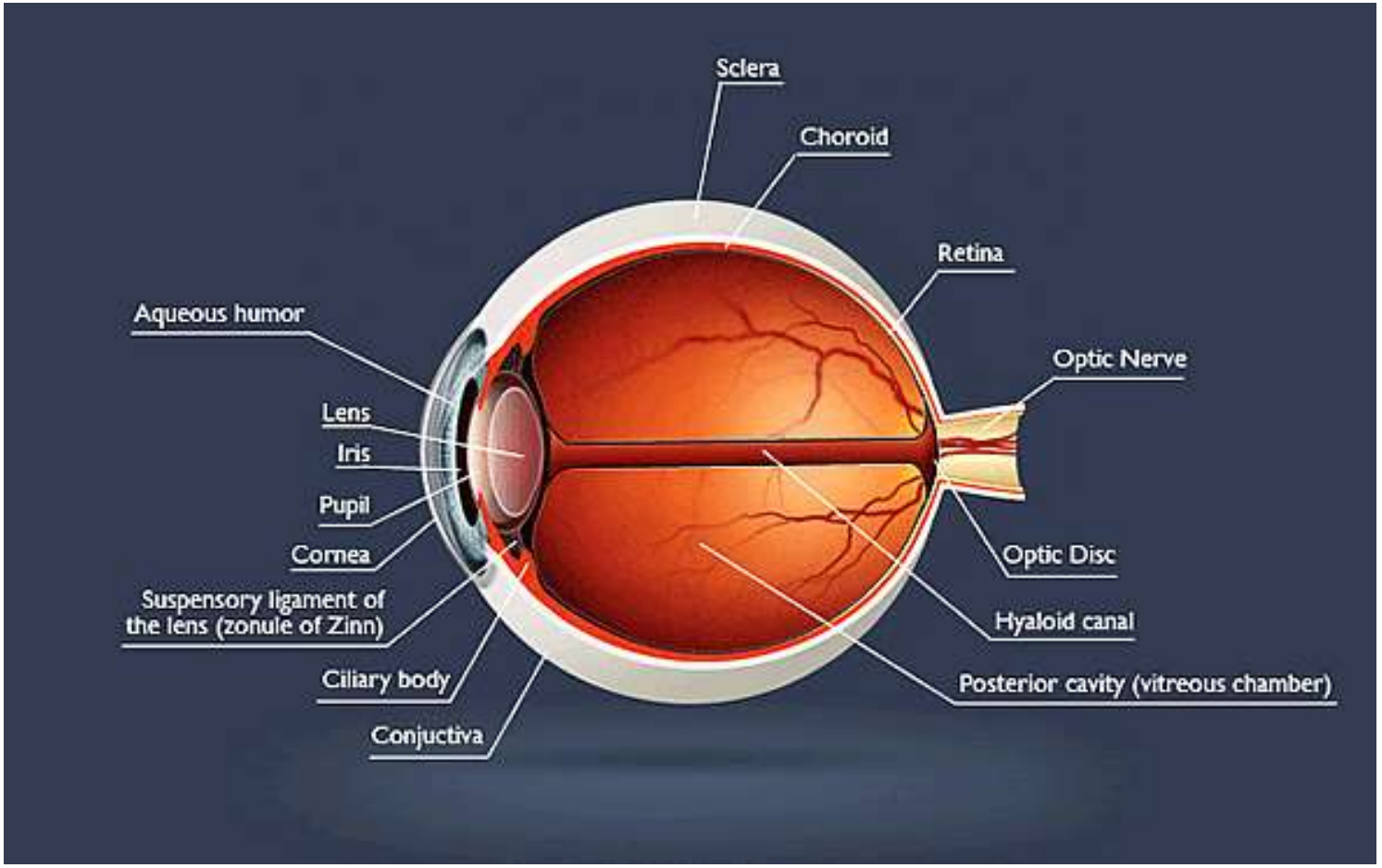
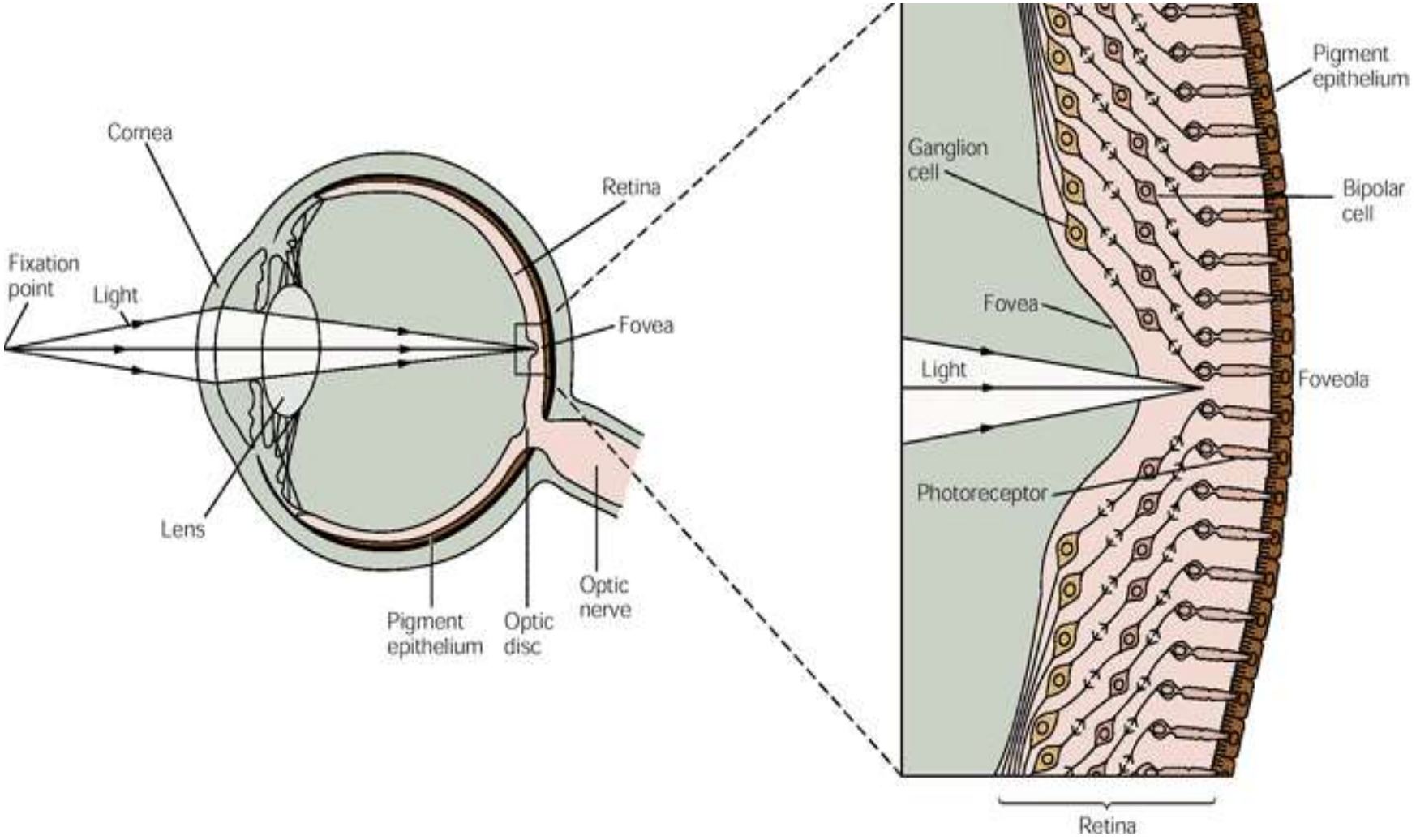
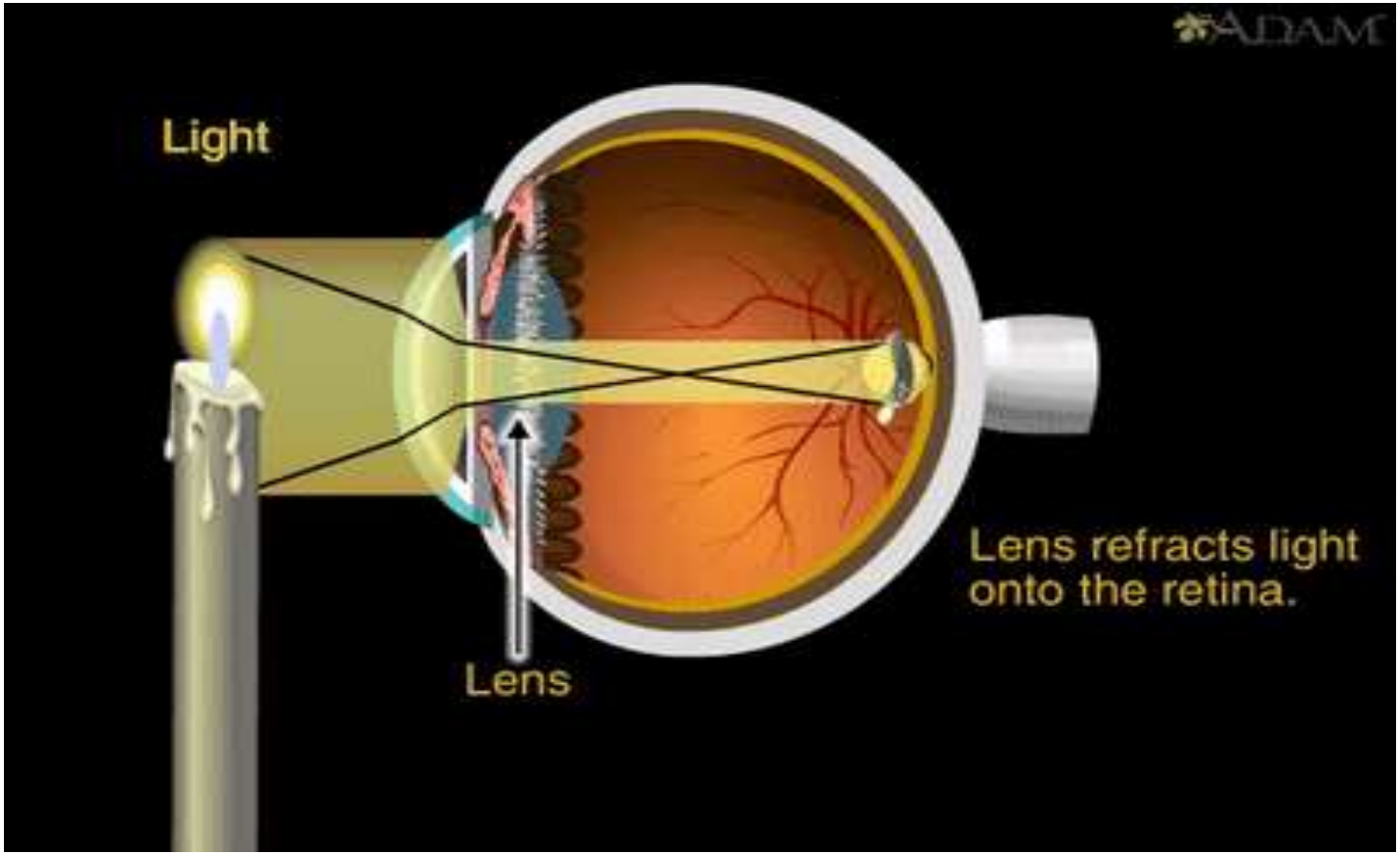
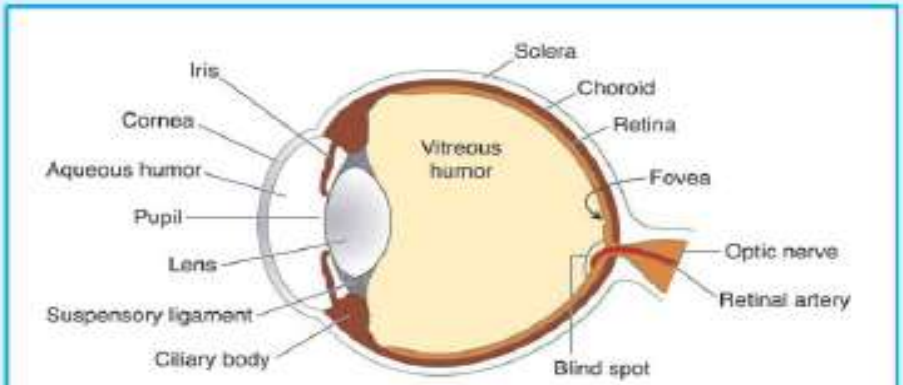
VISUAL SYSTEM

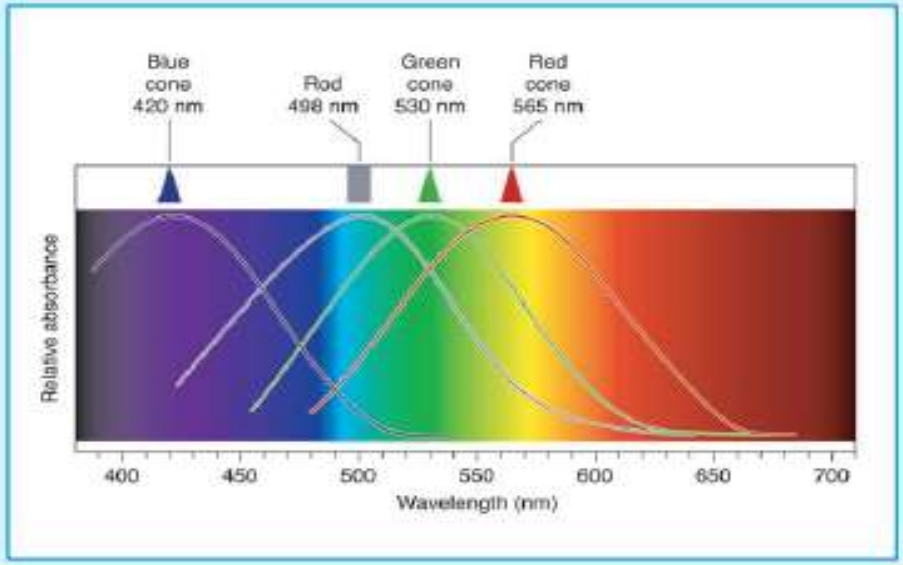
DR. GOUTAM DUTTA
Assistant Professor
Dept. of Physiology
Prabhat Kumar College, Contai

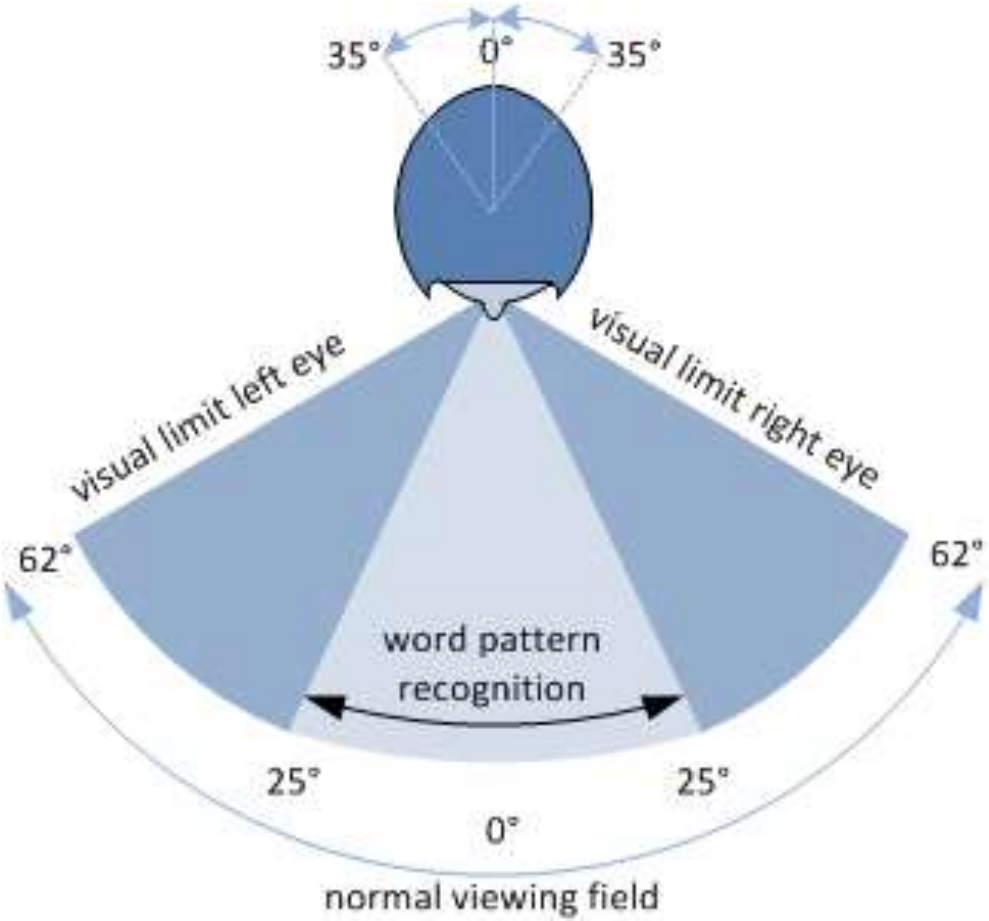

Sclera
Choroid
Retina
Aqueous humor
Optic Nerve
Lens
Iris
Pupil
Cornea
Optic Disc
Suspensory ligament of
the lens (zonule of Zinn)
Hyaloid canal
Ciliary body
Posterior cavity (vitreous chamber)
Conjuctiva

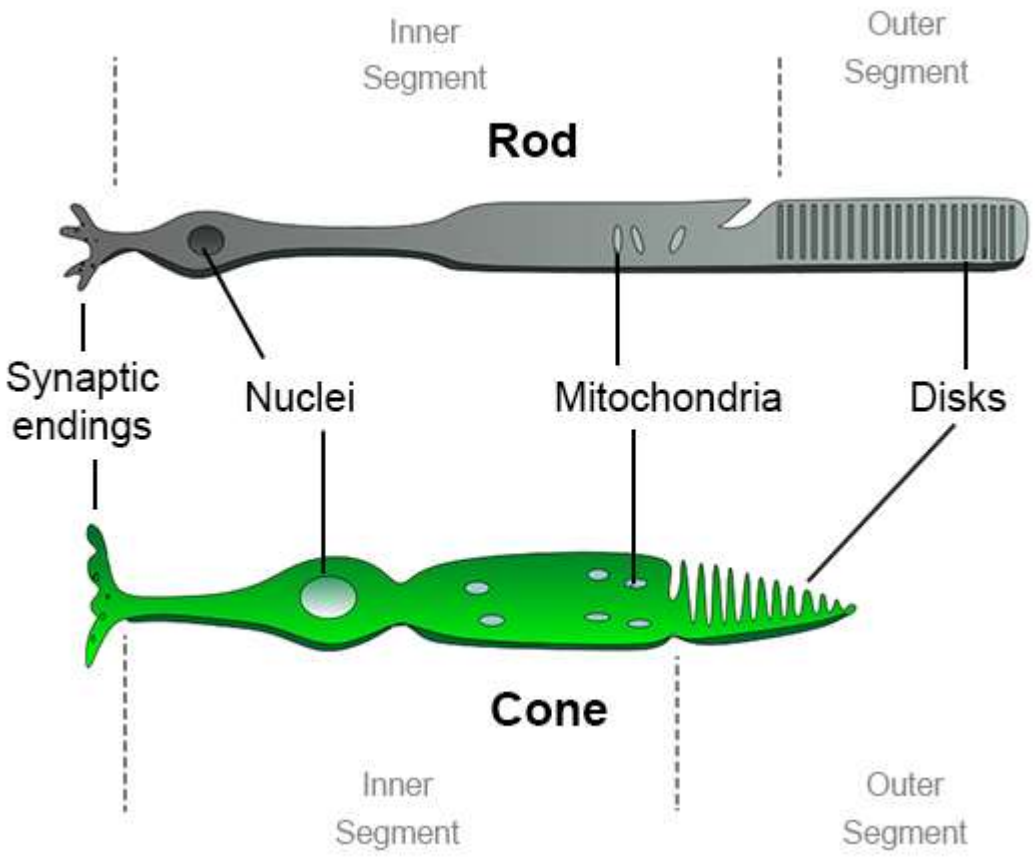

Cornea
Retina
Fixation point
Light
Fovea
Lens
Pigment epithelium
Optic disc
Optic nerve
Pigment epithelium
Ganglion cell
Bipolar cell
Fovea
Light
Foveola
Photoreceptor
Retina


Light
Lens refracts light onto the retina.
Lens

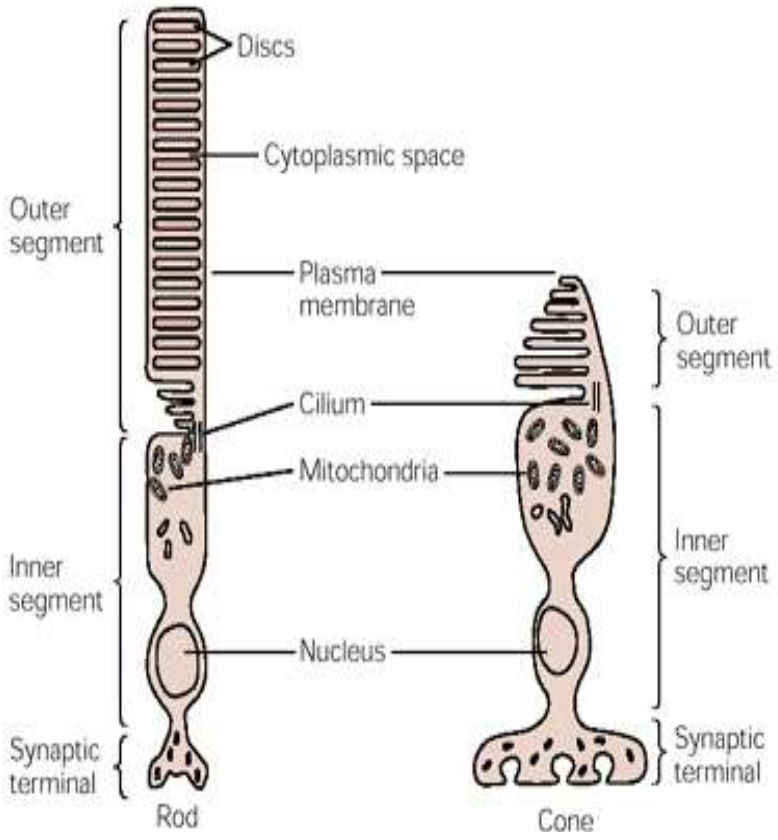

Sclera
Iris
Choroid
Cornea
Retina
Vitreous humor
Aqueous humor
Fovea
Pupil
Optic nerve
Lens
Retinal artery
Suspensory ligament
Ciliary body
Blind spot


Blue cone 420 nm
Rod 498 nm
Green cone 530 nm
Red cone 565 nm
Relative absorbance
400
450
500
550
600
650
700
Wavelength (nm)


35°
0°
35°
visual limit left eye
visual limit right eye
62°
62°
word pattern
recognition
25°
25°
0°
normal viewing field


Inner
Segment
Outer
Segment
Rod
Synaptic
endings
Nuclei
Mitochondria
Disks
Cone
Inner
Segment
Outer
Segment

A Morphology of photoreceptors



B Outer segments of photoreceptors

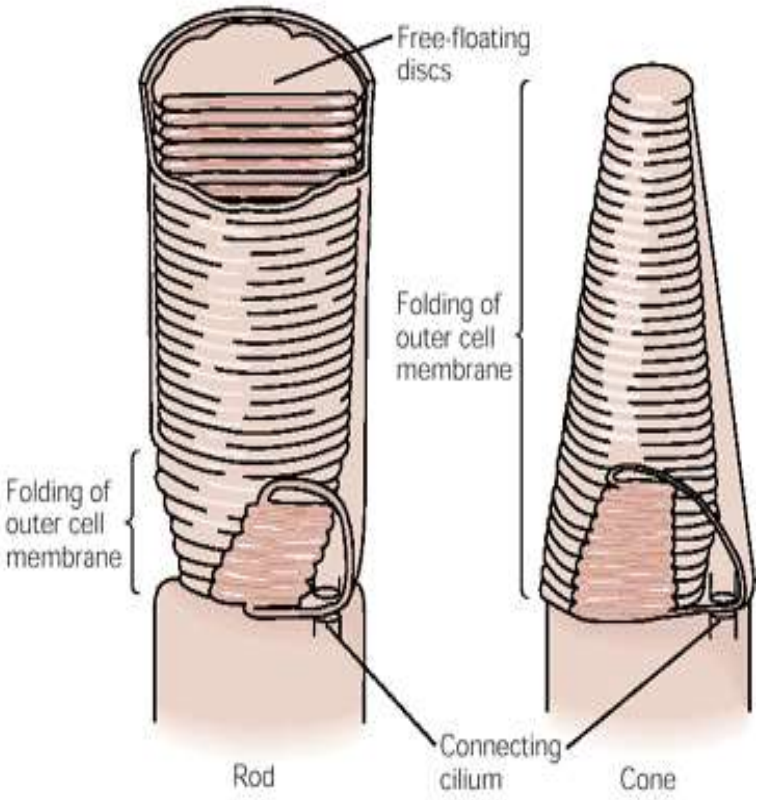
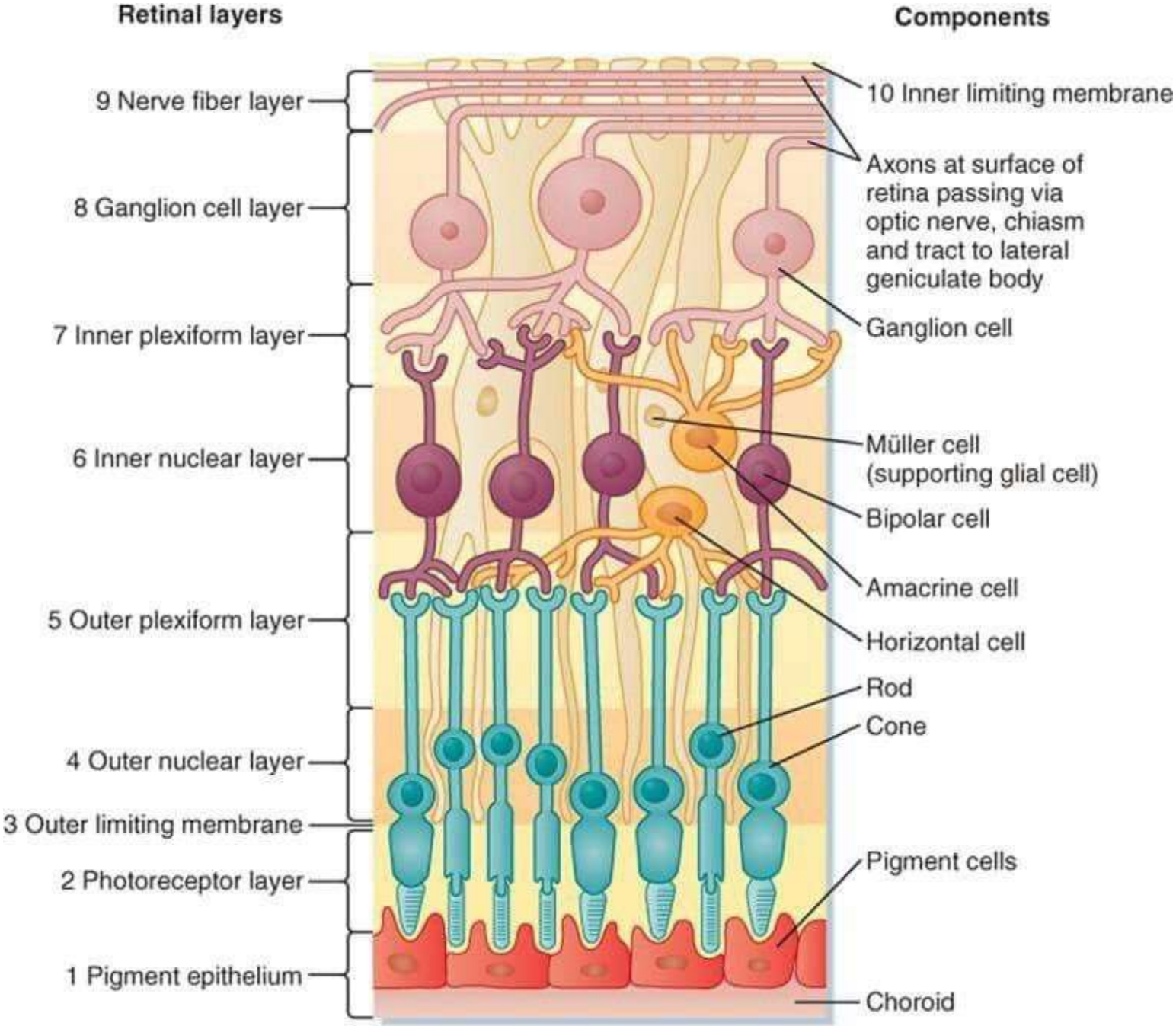
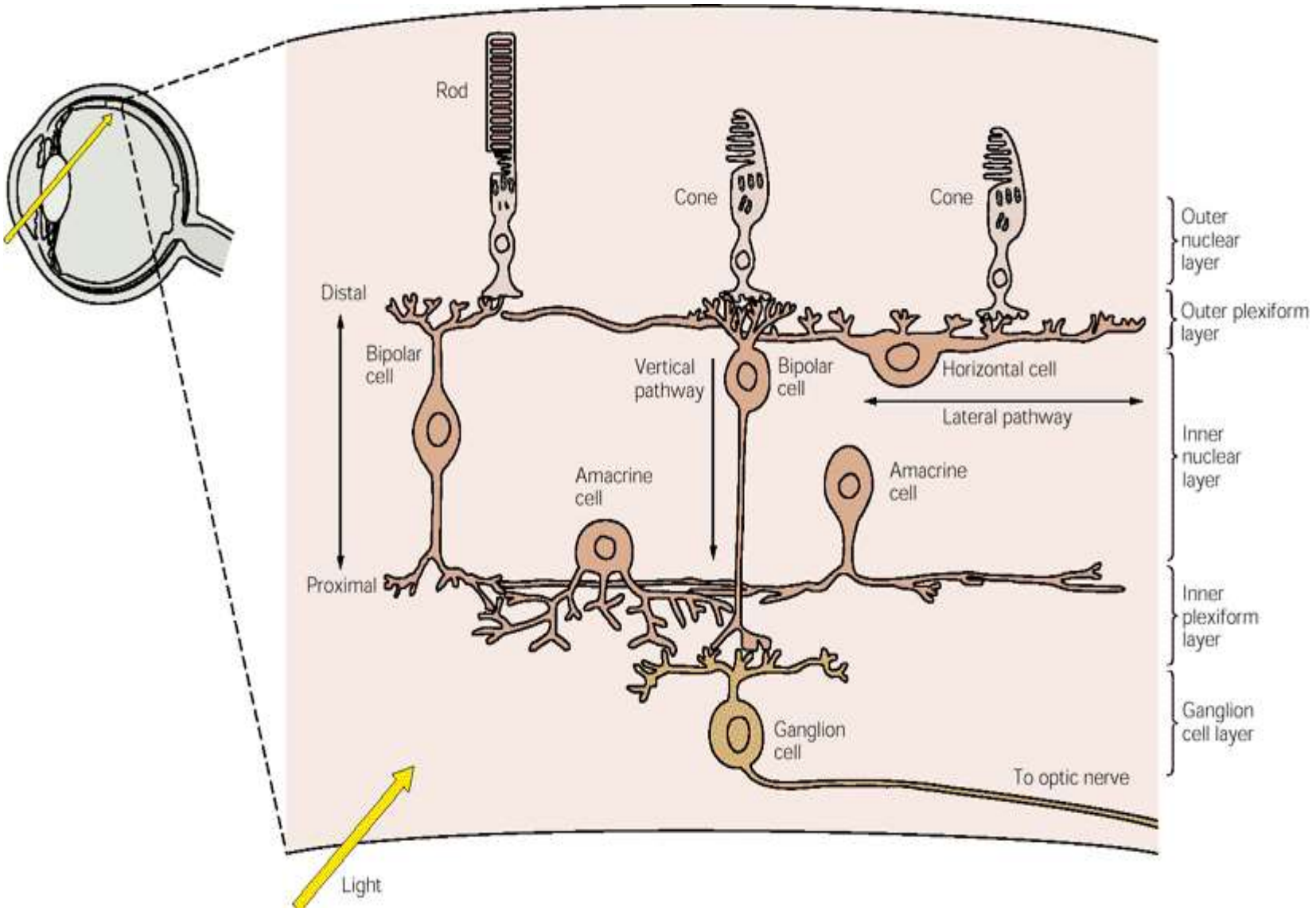
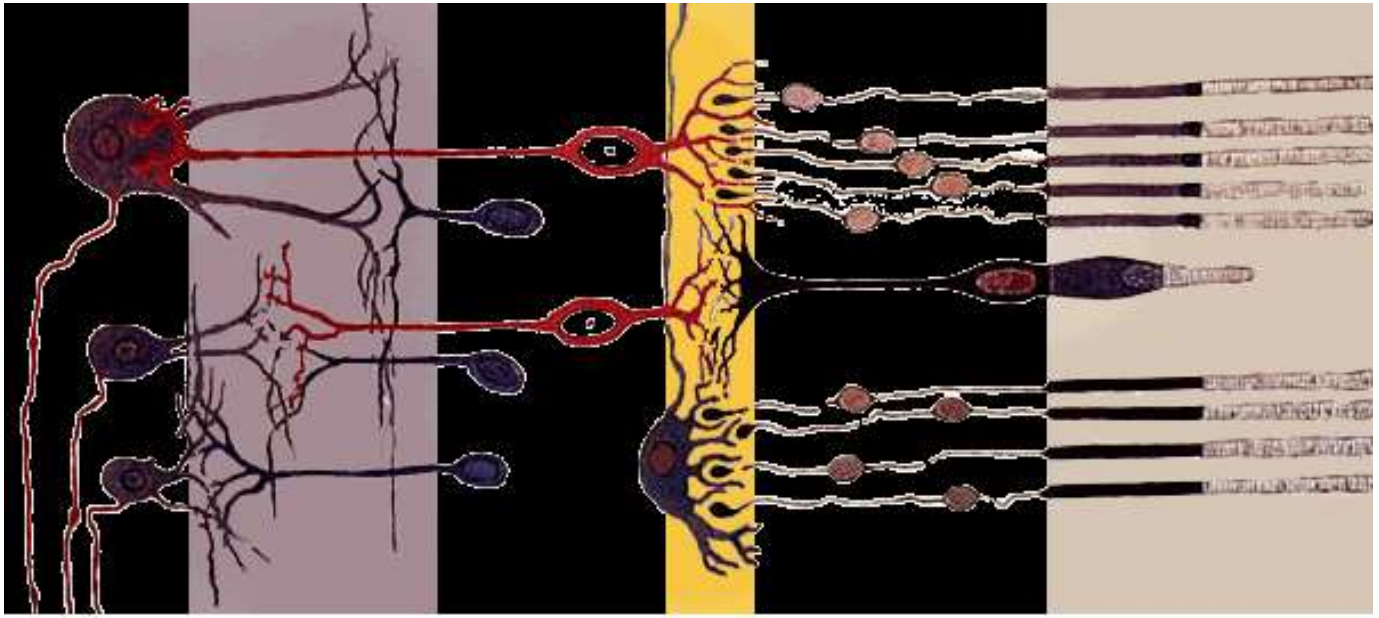


Table 26-1 Differences Between Rods and Cones and Their Neural Systems

Rods	Cones
High sensitivity to light, specialized for night vision	Lower sensitivity, specialized for day vision
More photopigment, capture more light	Less photopigment
High amplification, single photon detection	Lower amplification
Low temporal resolution: slow response, long integration time	High temporal resolution: fast response, short integration time
More sensitive to scattered light	Most sensitive to direct axial rays
Rod system	**Cone system**
Low acuity: not present in central fovea, highly convergent retinal pathways	High acuity: concentrated in fovea, dispersed retinal pathways
Achromatic: one type of rod pigment	Chromatic: three types of cones, each with a distinct pigment that is most sensitive to a different part of the visible light spectrum




Rod
Cone
Cone
Distal
Bipolar cell
Vertical pathway
Bipolar cell
Horizontal cell
Lateral pathway
Amacrine cell
Amacrine cell
Proximal
Ganglion cell
To optic nerve
Light
Outer nuclear layer
Outer plexiform layer
Inner nuclear layer
Inner plexiform layer
Ganglion cell layer



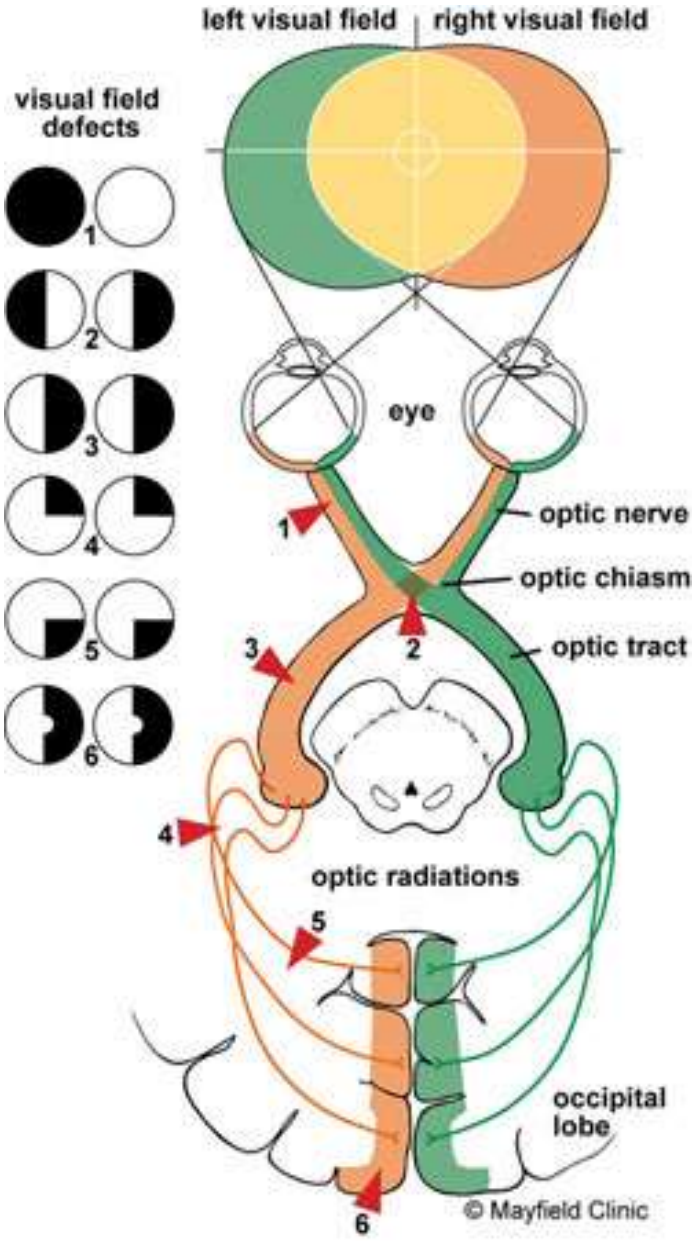
Ganglion cells

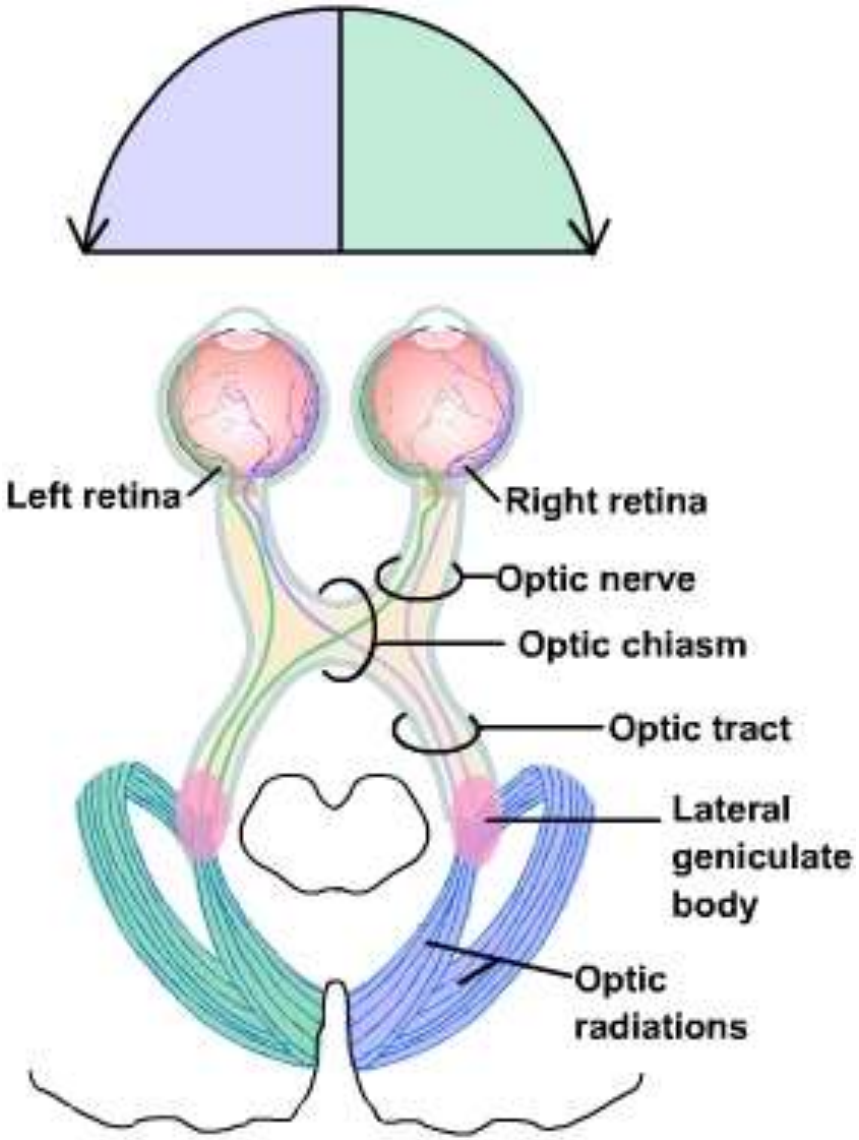
bipolar cells (red)

Amacrine cells (blue)

Horizontal cell

Photoreceptors


left visual field
right visual field
visual field defects
1
2
3
4
5
6
eye
optic nerve
optic chiasm
optic tract
optic radiations
occipital lobe
© Mayfield Clinic


Left retina
Right retina
Optic nerve
Optic chiasm
Optic tract
Lateral geniculate body
Optic radiations


thank you