CONCEPT MAP

THE EYE

he eye is a special organ of the sense of sight, an extension of human brain which permits humans to connect with the outside world. The adult human eveball is hollow, spherical structure, situated in the orbital cavity. Only 1/6th of the eyeball is visible outside.

Pigmented epithelium

It contains melanin pigment which along with the pigmented choroid absorbs light and prevents the reflection of rays back within eyeball which may distort the image formation.

Layers of Retina

External limiting membrane

Formed by the glial tissues, it is the continuation of internal limiting membrane and is pierced by the rods and cones.

Outer nuclear layer

Formed by the cell bodies and nuclei of rods and cones.

Contain photosensitive

pigment rhodopsin. The

rods mainly enable to see

in darkness, therefore are

present in large numbers

Cones

Contain photosensitive

pigment photopsin, involved in colour vision.

Outer plexiform layer

Axons of rods and cones

synapse here with dendrites of

bipolar cells and horizontal cell

Inner nuclear layer

Contains cell bodies and nuclei

of bipolar, neurons, horizontal

neurons and amacrine cells.

processes.

in nocturnal animals.

Ora serrata

Demarcates sensitive part of retina from its non sensory part.

Ciliary body

Made up of smooth muscle, changes the shape of the lens depending upon distance of object to bring images into focus.

Ciliary zonule (Suspensory ligament)

Holds the lens in place and connects it to the ciliary muscles.

Cornea

Anterior clear area of the sclera, which admits and focuses light into eyeball. The cornea is avascular and absorbs oxygen from the air.

Pigmented, opaque, muscular structure of eye, which gives colour to the eye and regulates intensity of light entering the eye either by constriction or dilation of pupil.

A hole in the centre of the iris, through which light enters the eye. Pupil dilates in dark to permit more light in and contracts in bright light to reduce light falling in.

Aqueous humor

Watery liquid, formed by capillaries / of ciliary processes, that fills space Atween the comea and lens. It deovides nutrition to avascular Guctures of the eye, i.e., cornea und lens and maintains intraocular Sessure and helps in image forming mechanisms.

Sclera

Middle vascular, dark, pigmented layer, which absorbs light entering the eye and stop it from reflecting back Tough, outermost, protective, fibrous, opaque coat made up of within eyeball. Blood vessels supply nutrients and oxygen dense connective tissue. It is white to other tissues, especially retina. in colour and gives shape to eyeball.

Retina

Innermost neural and sensory layer containing light sensitive cells, which send impulses through the optic nerve to brain.

Macula lutea (Yellow spot)

A small, oval, yellowish area on retina lying exactly opposite the centre of the comea.

Fovea centralis

A shallow depression in the middle of yellow spot, has cone cells only, devoid of rods and blood vessels. It is the place of most distinct vision.

Optic nerve

Carries image impulses to brain

Central artery and vein of the retina

Blood supply to eyeball

Blind spot

Point where optic nerve leaves the eyeball, devoid of light sensitive cells to detect image.

Rod end bulb

Nuclei -

Cone plate

Horizontal cell

Connect one receptor cell to another receptor cell.

Bipolar cells

Amacrine cell

Processes make synaptic contacts with dendrites of both ganglion and bipolar cells and connect ganglion cells to one another.

Ganglion cell

It gives rise to optic nerve fibres and sends impulses to brain.

Inner limiting membrane It separates the retina from the vitreous humor. It

is formed by the glial tissues.

Optic nerve fibres

Formed by joining the axon of ganglion cells; here all the axons run parallel.

Ganglion cell layer

A single layer of cell containing cell bodies of ganglion cells.

Inner plexiform layer

It is the site of major processing of the visual image. Axons of bipolar and Amacrine cell synapse with the dendrites of ganglion cells.

Mechanism of Vision

Vitreous humor

Clear jelly-like fluid that fills

space between the lens

and retina, which helps to

maintain the shape and

inner pressure of eyeball. It

allows undistorted light to

fall on retina.

Light induces dissociation of retinene from opsin which activates transducin, thereby causing potential generation.

Transparent, biconvex,

circular body lying

immediately behind

pupil. It forms image on

retina. It separates

aqueous and vitreous



Potential generated in photoreceptor cells triggers action potential in ganglion cells.



Action potential transmitted by optic nerve to visual area of the brain.

Neural impulses are analysed and erect image is recognised.

STERJEE Light is focussed on Light from object

Conjunctiva

Thin, clear, protective

front layer over the

surface of the eye and

lining the eyelids. An

infection of eye called

conjunctivitis occurs

pass through comea, retina, where it is aqueous humor, lens converted into potentials and vitreous humor. in rods and cones.

humors.