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HISTOLOGY OF SPECIAL SENSES AND NEUROHISTOLOGY

1. Histological importance of the eye in relation to their cellular function

The eyes is composed of 3 concentric layers: an external layer that consists of the sclera and the cornea, middle/vascular layer consisting of choroid, ciliary body and iris, inner layer of nerve tissues, retina.

1. Sclera :fibrous external layer of the eyeball made of dense connective tissues. It is commonly known as white of the eye. It provides attachments for the muscles of the eyes. The anterior part is covered by conjunctiva that helps lubricate the eyes therefore preventing the eyes from drying out
2. Cornea: colorless and transparent. Completely avascular. It has 5 layers: external stratified squamous epithelium, bowman’s membrane, stroma, Descemet’s membrane, inner simple squamous epithelium. It serves as the eye window and let light in and bend its rays, providing most of the eye focusing power.
3. Choroid: mainly comprises if blood vessels. Function in oxygen and nutrients supply to the eyes.
4. Ciliary body: anchors lens in place. consist of ciliary muscles which can change the shape of lens thereby providing accommodation. Ciliary processes produce and secrete aqueous humor
5. Iris: it covers the top of the lens. Its like an aperture and controls how much light is let into the eyes. It forms a circular, thin structure within the eyeball that regulates the size and diameter of the pupil. It contains pigment the determines a person eye color.
6. Lens: consists of a lens capsule, subcapsular epithelium (single layer cuboidal cells) and lens fibers. It has no blood vessel or nerve. Lens and cornea work together to focus light rays passing to the back of the eye by bending them. It also function in focusing in a process called accommodation.
7. Vitreous humor: transparent gel like connective tissue. Have cells called hyalocytes. It helps keep retina in place
8. Retina: light sensitive layer of the nervous tissue composed of multiple sensory cells. Has two cells for vision: rods for black-white vision and cones for colors in daylight. The point where optic nerves fibers depart from the eyeball and does not contain any photosensitive cell is call the blind spot.
9. Layers of the retina

The retina consists of 10 layers

1. The pigmented epithelium: consists of cuboidal or low columnar cells with basal nuclei. It is adjacent to the choroid. It absorbs light, it cells form part of the blood-retina barrier.
2. The rod and cone layer: it is the photoreceptor layer containing photosensitive outer segment of rods and cones.
3. Outer limiting layer: series of tight and adhering junctions that forms at rod and cones inner segment between the photosensitive and Muller cells processes.
4. Outer nuclear layer: contains cell bodies or the rod and cones cells
5. Outer plexiform layer: contains synapses between axons of photoreceptors and dendrites of intermediate neurons
6. Inner nuclear layer: contain cell bodies of several types of bipolar neurons which begin to integrate signals form the rod and cones cells
7. Inner plexiform layer: contains fibers and synapses of ganglion cells and bipolar neurons of inner nuclear layer
8. Ganglion layer: ganglion cells with longer axons
9. Nerve fiber layer: contains axons of the ganglion cells
10. Inner limiting layer

The virus can be absorbed into the eye by the retinal pigmented epithelium.