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Assignment

1. Write an essay on the histology importance of the eye in relation to their cellular functions
2. Corona virus can penetrate the body through eye and implicate the immune system, briefly discuss the layers of retina for more information penetration.

NUMBER 1

THE HISTOLOGICAL IMPORTANCE OF THE EYE

The eye is a complex and highly developed photosensitive organ that permits an accurate analysis of the form, light intensity and colour reflected from objects.

The eye has external and internal structures

THE EXTERNAL STRUCTURE OF THE EYE

This includes;

- **The conjunctiva;** which lines the inner part of the eyelids. The tarsal plate lies beneath the conjunctiva and contains meibomian glands, which secrete an oily substance to decrease the evaporation of the tear film.
- **Tear film:** The tear film consists of aqueous, mucus, and oily secretions.
- **Accessory glands:** Apocrine glands of Moll, meibomian glands, lacrimal glands.
- **Muscles:** Orbicularis oculi, levator palpebrae superioris, superior tarsal muscle.
- **Eyelid:** The eyelid, likewise known as the cover of the eye, a mobile layer made up of skin and also muscular tissue and also covers the eyeball.

THE INTERNAL STRUCTURE OF THE EYE

The eye can be viewed as a series of overlapping layer of tissue. It has 3 layers.

The external layer called fibrous tunic which consist of the **sclera** and **cornea**

The middles layer called vascular tunic which consist of the **Iris**, the **choroid** and the **ciliary body**

The internal layer called nervous tunic which consist of the **Retina, lens and vitreous**

IMPORTANCE OF THE EXTERNAL STRUCTURES OF THE EYE

1. The essential role of the external eye structures is to protect the delicate tissue of the internal eye.
2. The eyelid prevents foreign bodies from entering the inner eye and helps refresh and distribute the tear film by blinking.
3. Eyelashes are finely sensitive to touch and warn the eye of possible debris and particles that may cause injury.
4. The conjunctiva keeps the front surface of the eye moist and lubricated. It keeps the inner surface of the eyelids moist and lubricated so they open and close easily without friction or causing eye irritation.
5. The precorneal tear film makes the surface of the eye moist and prevents the epithelial cells from becoming dry and damaged.

IMPORTANCE OF THE INTERNAL STRUCTURES OF THE EYE

Internal parts of the eye have primarily structural and visual functions. The cornea serves a protective role and is responsible for two-thirds of the refractive properties of the eye. The remaining one-third of refraction is performed by the lens, which is functionally adjustable through the action of the zonular fibers and ciliary muscles. At the end of the visual process, as rays of light bend through the cornea and lens, photon energy is converted to neurochemical action potentials by cells of the retina, which then send these impulses to the brain, via the optic nerve.

The uvea of the eye is a crucial mediator of nutrition and gas exchange, as blood vessels course through the ciliary body and iris, while the choriocapillaris in the posterior eye help support the retina. This abundant blood supply is implicated in uveitis, as inflammatory mediators enter the eye through this vascular network

In summary,

1. The sclera aids in maintaining the shape of the eyeball. The tough, fibrous nature of the sclera also protects the eye from serious damage such as laceration or rupture from trauma
2. The cornea acts as the eye's outermost lens. It functions like a window that controls and focuses the entry of light into the eye. The cornea contributes between (65-75)% of the eye's total focusing power.
3. It regulates the amount of light that enters the eye
4. The choroid of the eye provides oxygen and nourishment to the outer layers of the retina. It forms the uveal tract along with the ciliary body and iris.
5. The retina converts focused light into neural signals and sends these signals to the brain for visual recognition

NUMBER 2

THE LAYERS OF THE RETINA

The retina, nervous tissue of the eye where photons of light convert to neurochemical energy via action potentials

Moreover, the retina itself is divided into various layers as follows:

Retinal pigment epithelium: made of cuboidal cells containing melanin which absorbs light. These cells also establish a blood-retina barrier through tight junctions.

"Rod and cone cells": the layer of cells with photoreceptors and glial cells. Rods are located peripherally and are more sensitive to light and motion than cones. Cones have higher visual acuity and specificity for color vision.

- "*Outer limiting membrane*": a layer of Muller cells and rod/cone junctions which serves to separate the photosensitive regions of the retina from the areas that transmit the electrical signals.
- "*Outer nuclear layer*": This layer consists of nuclei of rod and cone cells.
- "*Outer plexiform layer*": This layer contains synaptic processes of rod and cone cells.
- "*Inner nuclear layer*": This layer contains the cell body of glial, amacrine, bipolar, and horizontal cells
- "*Inner plexiform layer*": This layer relays information from cells of the inner nuclear layer. Thus, this layer has axons of amacrine, bipolar, and glial cells and dendrites of retinal ganglion cells.
- "*Ganglion cell layer*": This layer contains nuclei of retinal ganglion cells.
- "*Nerve fiber layer*": This layer contains axons of retinal ganglion cells and the astroglia which support them. Collectively, these axons constitute the optic nerve.
- "*Internal limiting membrane*": A thin layer of Muller glial cells and basement membrane which demarcates the vitreous anteriorly from the retina posteriorly.