**17/MHS01/204**

*1 Write an essay on the histological importance of the eye in relation totheir cellular* *function.*

The eyes are highly developed photosensitive organs for analyzing the form, intensity and color of light reflected from objects and providing the sense of light. The eye is composed of three concentric layers or tunics.

-A tough external fibrous layer consisting of the sclera and the transparent cornea

-A middle vascular layer that includes the choroid, ciliary body and iris.

-An inner sensory layer, the retina which communicates with the cerebrum through the posterior optic nerve.

**A FIBROUS LAYER**

This layer is made of dense connective tissue, which protects the eyeball and maintains the shape. This layer includes two major regions; the posterior sclera and anterior cornea, joined at the limbus.

**-**Sclera; the sclera protects the most delicate internal structures and protects site for muscle insertion. It consists mainly of dense connective tissues with fat bundles of type I collagen parallel to the organ surface. Tendons of the extraoccular muscles which move the eyes insert into the anterior region if the sclera. The anterior, visible part of the sclera as well as the inner surface of the eyelids are covered by the conjunctiva , a mucus layer that helps lubricate the eye together with the tears made by the lacrimal glands, thus protecting the eye from drying out.

-Cornea; the transparent cornea occupies the front centre part of the external tunic. It serves as the eye window, which lets the light in and bends the rays thereby providing most of the eyes focusing power. A section of the cornea shows five distinct layers;

I. An external stratified squamous epithelium

ii. An anterior limiting membrane

iii. The thick stroma

iv. A posterior limiting membrane

v. An inner simple squamous epithelium

Function of the fibrous layer

1 Supports eye shape

2 Protects delicate internal structures

3 Protects anterior surface of the eye

4 Refracts incoming light

**B VASCULAR LAYER**

The eye’s more vascular middle layer, known as uvea, consists of 3 parts from posterior to anterior; the choroid, ciliary body and the iris.

-The Choroid; Located n the posterior two-thirds of the eye, the choroid consist of loose, well vascularized connective tissue and contain numerous melanocytes. These form a characteristic black layer in the choroid and prevent light from entering the eye except through the pupil. Two layers make up the choroid.

I. the inner choroido-capillary lamina has a rich microvasculature important for nutrition of the other retinal layers.

ii. Bruch’s membrane, a thin extracellular sheet is composed of collagen and elastic fibers surrounding adjacent microvasculature and basal lamina of the retina’s pigmented layer.

-Ciliary body: the anterior expansion of the uvea that encircles the lens, posterior to the limbus. One function of the ciliary body is anchoring of the lens in place.. Important structures associated with the ciliary body includes

I. Ciliary muscle: This can change the shape of the lens for adjustment to far or near respectively. It consists of three groups of smooth muscle fibers.

II. Ciliary processes: are a radially arranged series of about 75 ridges extending from the inner highly vascular region of the ciliary region. The epithelial cells directly covering the stroma contain much melanin and correspond to the anterior projection of the pigmented retina epithelium.

III. Ciliary zonule: is a series of many radially oriented fibers containing largely of fibrin.

-Iris: which us connected to the anterior part of the ciliary body, covers the top of the lens. Similar to the aperture of the camera, it controls how much light is let into the eye. The iris forms a circular thin structure within the eyeball hat regulates the size and diameter of the pupil. It also contains pigments, the amount of which determines a person’s eye color.

**C SENSORY LAYER**

The third layer is the retina which is responsible for the perception of images. The retina is a light sensitive layer of nervous tissue composed of multiple sensory cells, so called light or photoreceptor cells, as well as associated nerve cells and other type of cells working together to make a person see. There are two types of photoreceptor cells: rods and cones.

*2. Corona virus can penetrate the body through the eye and implicate the immune system****, briefly*** *discuss the layers of the retina for information penetration.*

The retina, the innermost tunic of the eye, develops with two fundamental sub layers from the inner and outer layers of embryonic optic cup.

1. The outer pigmented layer is a simple cuboidal epithelium attached to the Bruch’s membrane and the choroid capillary lamina of the choroid. This heavily pigmented layer forms the outer part of the dual epithelium covering the ciliary body and posterior iris.

The pigmented layer absorbs scattered light that passes through the neutral layer supplementing the choroid in this regard.

1. The inner retinal region, the neural layer, is thick and stratified with various neurons and photoreceptors. Although its neural structure and visual function extend anterior only as far as the ora serrata, this layer continues as part of the dual cuboidal epithelium that covers the surface of the ciliary body and posterior iris.