

The transition zone between sclera and cornea is called the limbus and has a fuzzy appearance. The eye contains three basic layers: the fibrous (corneo-scleral) coat, the uvea or uveal tract (choroid, ciliary body and iris) and the neural layer (retina). These coats surround the contents of the eye, which are the lens, the aqueous humor and the vitreous body [Forrester et al. 2001]. The cornea, with an index of refraction of 1.376, is responsible for most of the refractive power of the eye. After the cornea, light passes through the aqueous humor (index of refraction 1.336), the lens (index of refraction ranges from 1.386 in the outer layer to 1.406 at the center) and the vitreous body (index of refraction 1.337) before it reaches the retina [Hecht 1987]. Drawing by Karen Lefohn. Used with permission.

2 The Human Eye

2.1 Overview

The human eye is an organ designed for photo-reception; i.e. converting light energy to nerve action potentials. These action potentials are subsequently relayed to the optic nerve and the brain, where further processing occurs, resulting in conscious vision. All structures in the eye are subservient to this physiological process [Forrester et al. 2001]. The largest structure of the eye is the sclera (Figure 1), which is approximately spherical with a radius of around 11.5 mm. The cornea is somewhat in front of this structure and has a radius of 7.8 mm. The sclera takes around 56% of the circumference of the eye, while the cornea is responsible for the other 16%.