that runs to the visual centres of the brain. There are several sets of synapses present in the retina, which allows the eye to modify the information transmitted from the receptor cells to the brain. There are no rods and cones present in the optic disc, and as such this region on the lower outside of the retina is a blind spot, i.e. light focused on that part is not detected. The theoretical line through the centre of the lens is referred to as the optical axis. The fovea or "yellow spot" lies on the optical axis and is the place of most acute vision. This portion contains many cones but few rods.

The second constituent of the light-focusing system of the eye is the lens which is suspended just behind the pupil by a suspensory ligament attached to the ciliary body. The lens and the ciliary body divide the eye into two cavities. The ciliary body constantly produces the clear, watery aqueous humour that fills the front cavity of the eye. The back cavity, filled with the jelly-like vitreous humour constitutes most of the volume of the eye. The aqueous and vitreous humour function as liquid lines that helps focus light onto the retina. The lens itself is a transparent protein disc that focuses an image on the retina.

The eye is similar to a camera. The cornea and lens, which are two constituents of the light-focusing system, form an inverted image on the retina. The iris regulates the opening of the lens while the eyelids prevent light from entering and also prevents any possible damage to the surface of the cornea. The ciliary muscle controls the lens so that objects from different distances may be brought sharply into focus. The focusing of light onto the retina can be accomplished by this mechanism and also by the curvature of the cornea. The cornea has a refractive index of 1.38; the lens is 1.42 whereas the refractive index of both humours is 1.33. The largest difference in refractive index occurs between the air and cornea and therefore it is essential for image formation. The delicate and accurate control is achieved by the lens which acts as a fine adjustment.

Photoreceptors: Rods and Cones

The retina contains millions of photoreceptor cells. These are referred to as rods and cones and the names of these cells come from their individual shapes. The human retina contains approximately 125 million rods and 6 million cones. The rod cells are abundant toward the periphery of the retina while the cone cells are abundant in the central portion of the retina. Each rod cell or cone cell has an outer segment with a stack of folded membranes or discs, in which visual pigments are embedded.

The visual pigment in the rods is built into the membranes of the flattened vesicles in the outer segment and is referred to as rhodopsin. In the cones, the visual pigment is known as iodopsin. They are thought to be three types of cone cells which contain different forms of iodopsin and as such they respond to light of different wavelengths. One responds best to red light, one to green and the other to blue. In general, colours are detected as a result of the relative degree of stimulation of the three types of cones. The sensation of white light is observed when all three types of cones are stimulated equally. The cone cells are concentrated in a central part of the retina, called the fovea, and as a consequence a person can only perceive the colour of an object if its image falls close to the fovea or in the direct line of vision.