

CLASS-9

(anatomy)

Language

The lens is a transparent biconvex structure in the eye that, along with the cornea, helps to refract light to be focused on the retina. By changing shape, functions to change the focal length of the eye so that it can focus on objects at various distances, thus allowing a sharp real image of the object of interest to be formed on the retina. This adjustment of the lens is known as accommodation (see also below). Accommodation is similar to the focusing of a photographic camera via movement of its lenses. The lens is more flat on its anterior side than on its posterior side.

Lens

Light from a single point of a distant object and light from a single point of a near object being brought to a focus by changing the curvature of the lens.

Schematic diagram of the human eye.

Details

Part of

Eyeball

System

Visual system

Function

Refract light

Identifiers

Latin

lens crystallin

MeSH

D007908

TA

A15.2.05.001

FMA

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Anatomical terminology

[edit on Wikidata]

The lens is also known as the aquula (Latin, a little stream, dim. of aqua, water) or crystalline lens. In humans, the refractive power of

the lens in its natural environment is approximately 18 dioptries, roughly one-third of the eye's total power.

Structure Edit

The lens is part of the anterior segment of the human eye. In front of the lens is the iris, which regulates the amount of light entering into the eye. The lens is suspended in place by the suspensory ligament of the lens, a ring of fibrous tissue that attaches to the lens at its equator[1][2] and connects it to the ciliary body.

Posterior to the lens is the vitreous body, which, along with the aqueous humor on the anterior surface, bathes the lens. The lens has an ellipsoid, biconvex shape. The anterior surface is less curved than the posterior. In the adult, the lens is typically circa 10 mm in diameter and has an axial length of about 4 mm, though it is important to note that the size and shape can change due to accommodation and because the lens continues to grow throughout a person's lifetime.[3]

Microanatomy Edit

The lens has three main parts: the lens capsule, the lens epithelium, and the lens fibers. The lens capsule forms the outermost layer of the lens and the lens fibers form the bulk of the interior of the lens. The cells of the lens epithelium, located between the lens capsule and the outermost layer of lens fibers,

are found only on the anterior side of the lens. The lens itself lacks nerves, blood vessels, or connective tissue.[4]

Lens capsule [Edit](#)

The lens capsule is a smooth, transparent basement membrane that completely surrounds the lens. The capsule is elastic and is composed of collagen. It is synthesized by the lens epithelium and its main components are Type IV collagen and sulfated glycosaminoglycans (GAGs).[3] The capsule is very elastic and so allows the lens to assume a more globular shape when not under the tension of the zonular fibers (also called suspensory ligaments), which connect the lens capsule to the ciliary body. The capsule varies from 2 to 28 micrometres in thickness, being thickest near the equator and thinnest near the posterior pole.[3]

Lens epithelium [Edit](#)

The lens epithelium, located in the anterior portion of the lens between the lens capsule and the lens fibers, is a simple cuboidal epithelium.[3] The cells of the lens epithelium regulate most of the homeostatic functions of the lens.[5] As ions, nutrients, and liquid enter the lens from the aqueous humor, Na^+/K^+ -ATPase pumps in the lens epithelial cells pump ions out of the lens to maintain appropriate lens osmotic concentration and volume, with equatorially positioned lens epithelium cells contributing most to

this current. The activity of the Na^+/K^+ -ATPases keeps water and current flowing through the lens from the poles and exiting through the equatorial regions.

The cells of the lens epithelium also serve as the progenitors for new lens fibers. It constantly lays down fibers in the embryo, fetus, infant, and adult, and continues to lay down fibers for lifelong growth