



## Tear Film

**General Functions of Tear Film:** It is essential in maintaining the optical quality of the cornea as well as the health of the cornea and conjunctiva. It passes lysozyme, an antibacterial enzyme that inhibits bacterial proliferation. When contact lenses are worn, the tear film provides oxygen exchange as the lens is moved. As we'll see later in this section, the tear film can be shaped into a liquid lens with significant refractive power by the front surface of the cornea and the back surface of a rigid contact lens.

The precorneal tear film consists of three layers, the *lipid*, *aqueous*, and *mucoïd*.

**Lipid Layer:** The top or outer layer of the tear film consisting of a fatty material which forms a very thin layer over the whole surface of the tear film. It functions primarily to prevent evaporation of the tear film. Rapid tear evaporation would cause dry areas on the cornea resulting in discomfort and corneal damage. The lipid film is produced by the *meibomian* glands located in the upper and lower eyelids.

**Aqueous Layer:** The middle layer of the tear film which consists of 98% water and accounts for most of the thickness. It contains ions and other molecules such as sodium and potassium along with a concentration of protein. The aqueous is secreted by the lacrimal glands which are located in the palpebral conjunctiva or the temporal portion of the upper cul de sac.

**Mucoid Layer:** The bottom or innermost layer of the tear film located immediately against the corneal and conjunctival epithelial cells. It is produced by the goblet cells located in the conjunctiva. The mucoid layer functions primarily to convert the hydrophobic epithelial layer of the cornea to a hydrophilic surface. Without the mucoid layer the tear film would break up very rapidly, resulting in drying and corneal damage.

