

Al–Mustaqbal University College  
Second stage  
Department of Optics Techniques



كلية المستقبل الجامعة الاهلية  
المرحلة الثانية  
قسم تقنيات البصريات

# Introduction the Lacrimal System and Tears

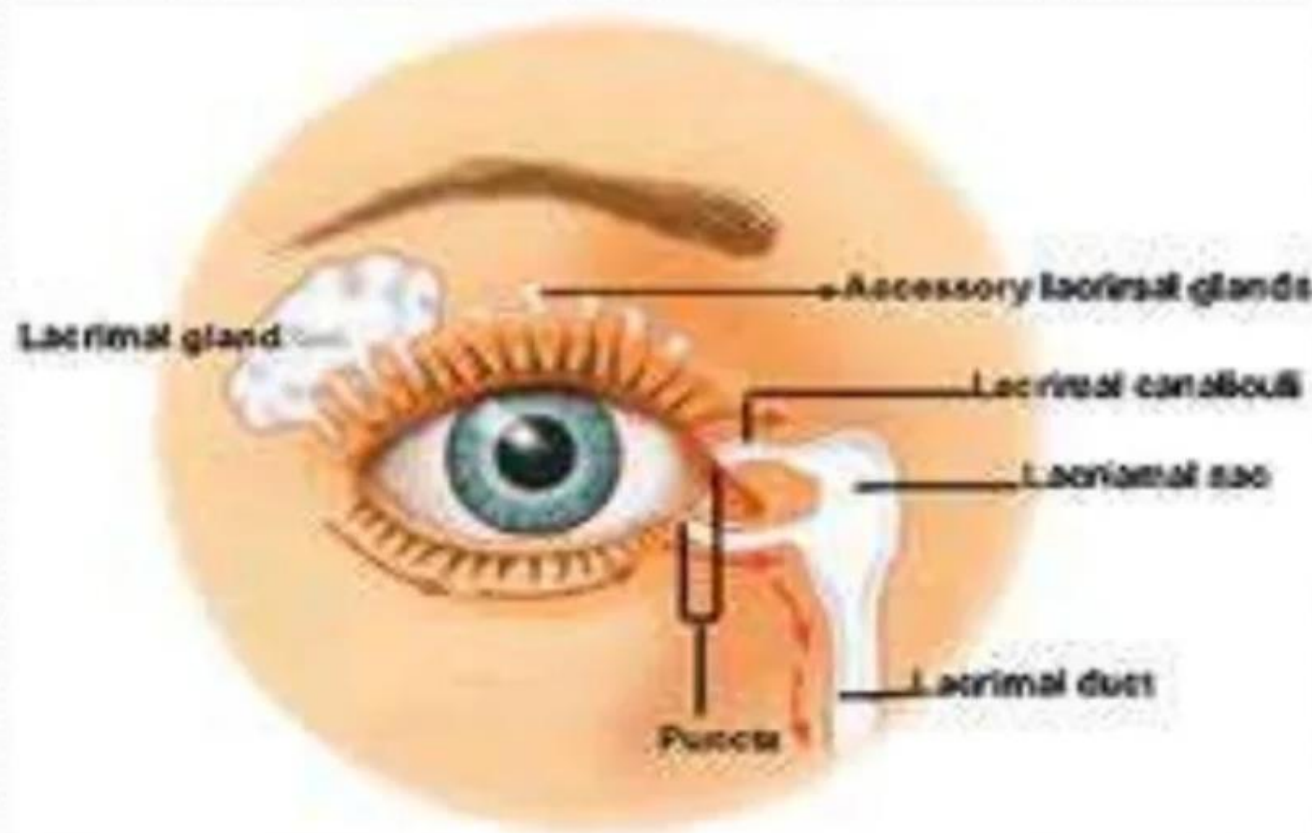
Lab : 1

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# definition

- The lacrimal system is the physiological system containing the orbital structures for tear production and drainage.

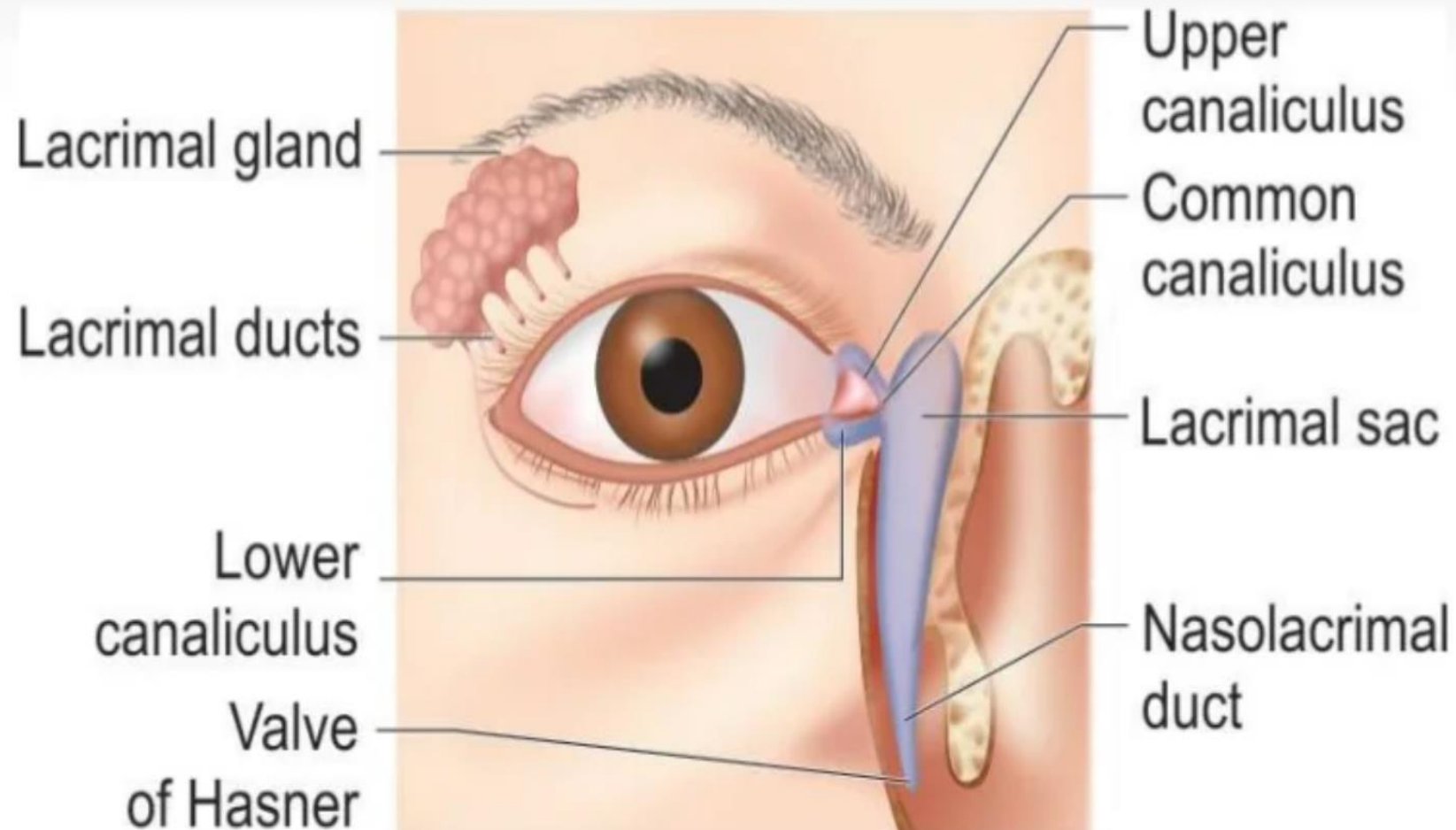




The lacrimal apparatus comprises

- Lacrimal glands, and
- Lacrimal passages, which include: puncta, canaliculi, lacrimal sac and nasolacrimal duct.

# The lacrimal system



# LACRIMAL system

It comprises the structures concerned with the :-

## 1) Formation of tears-

Main **lacrimal gland**

Accessory **lacrimal glands**

## 2) Transport of tears-

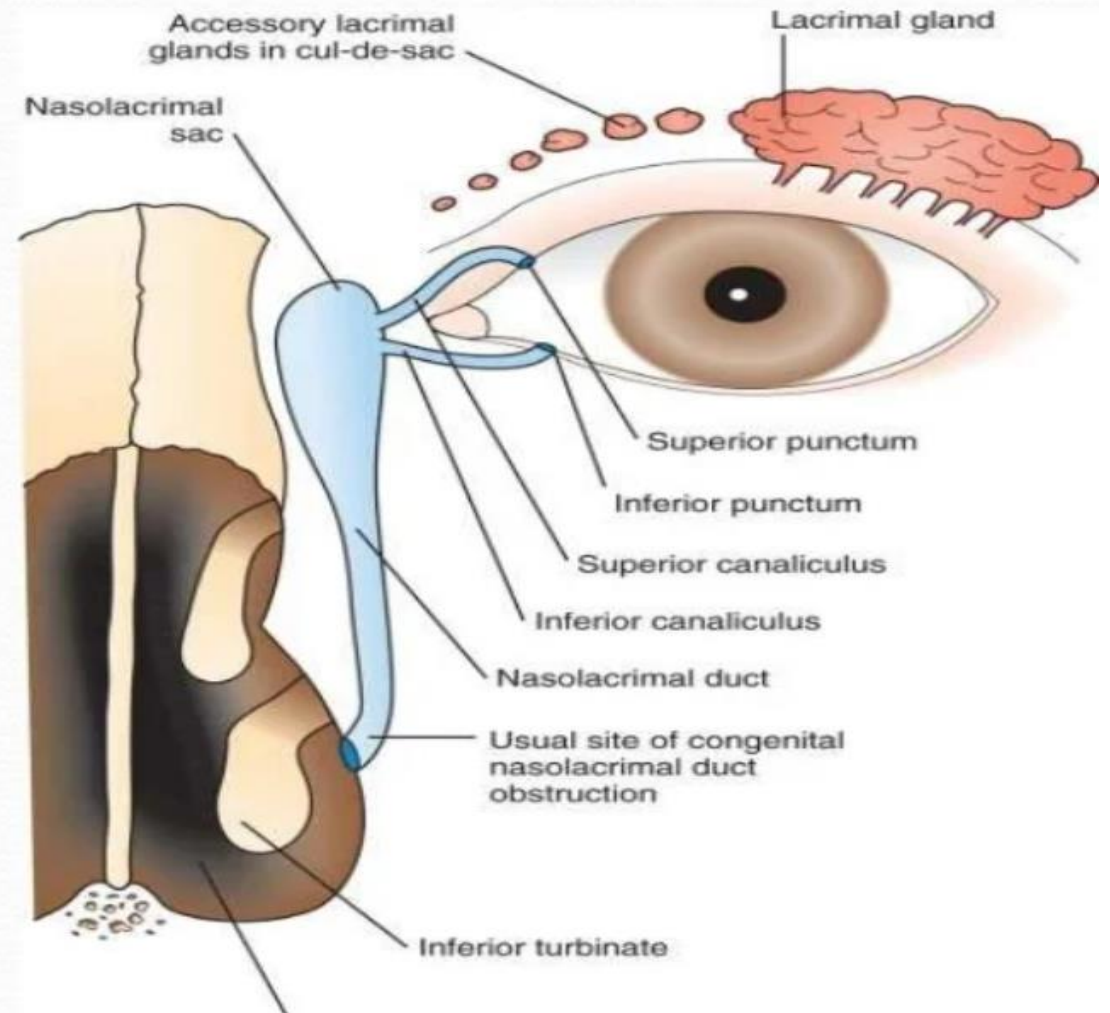
by **lacrimal passage**

Includes- Puncta

Canaliculi

Lacrimal sac

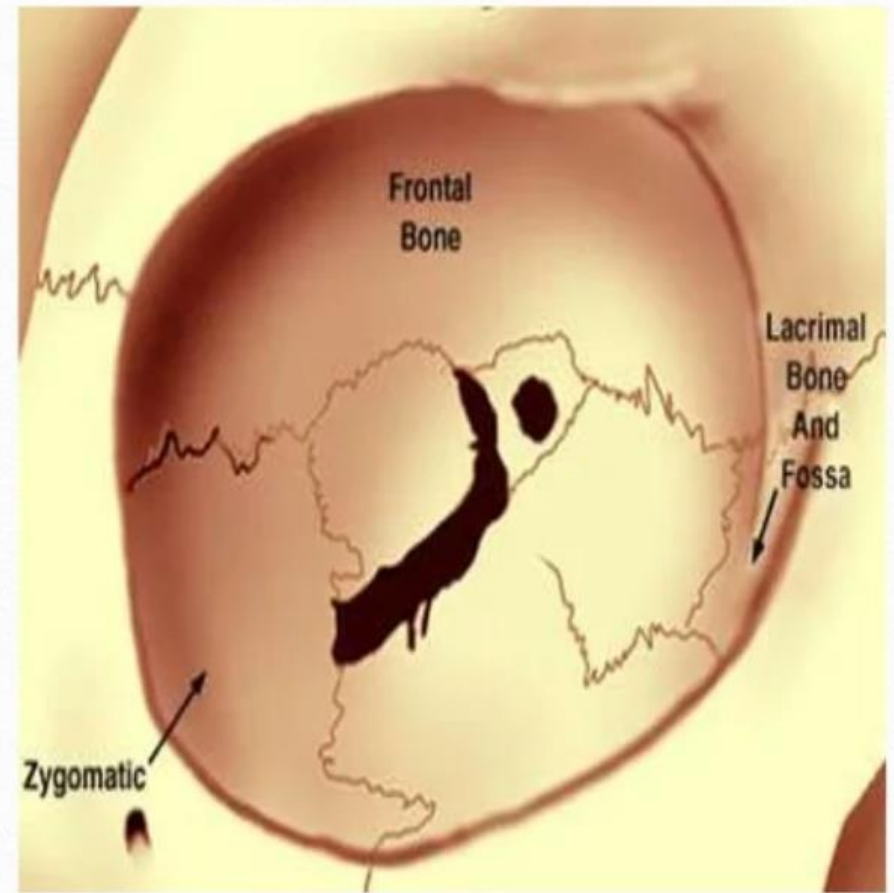
Nasolacrimal duct.



# LACRIMAL GLAND

## LOCATION-

- Main Lacrimal Gland lies in the fossa for lacrimal gland (**FOSSA LACRIMALIS**) of the frontal bone which lies in upper and outer corner of orbit.
- Inferiorly gland rests on globe of eye.



# MAIN LACRIMAL GLAND

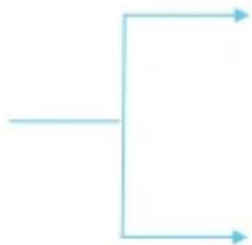


- ▶ It consists of an upper orbital and a lower palpebral part.

## 1. Orbital part

- situated in fossa for lacrimal gland
- size of a small almond

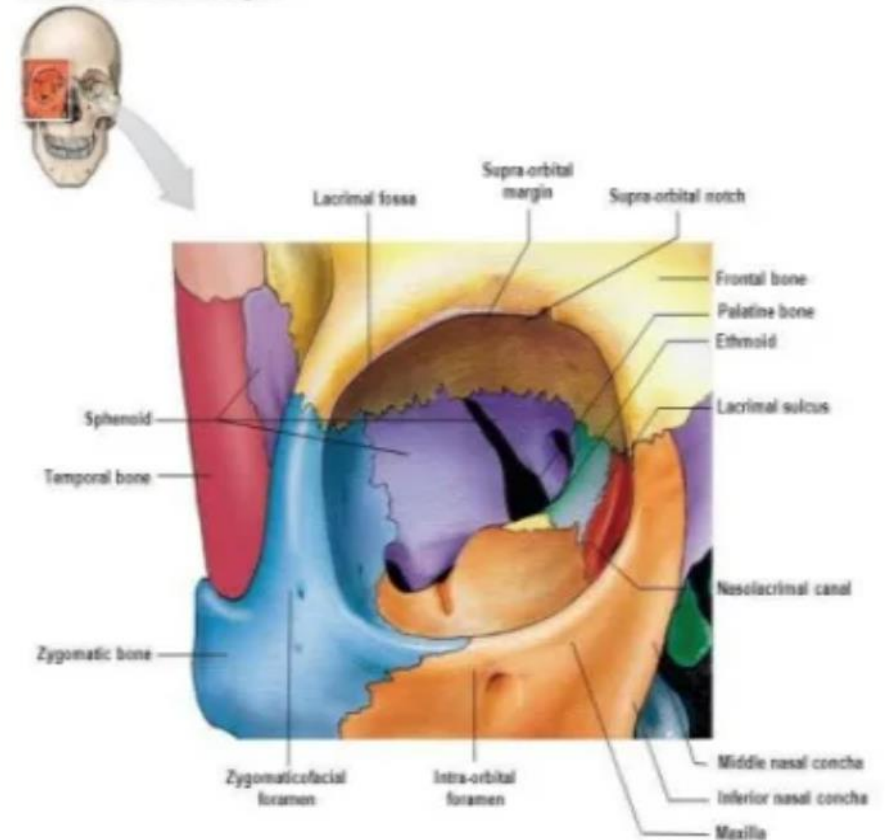
-2 surfaces



Superior - contact with bone

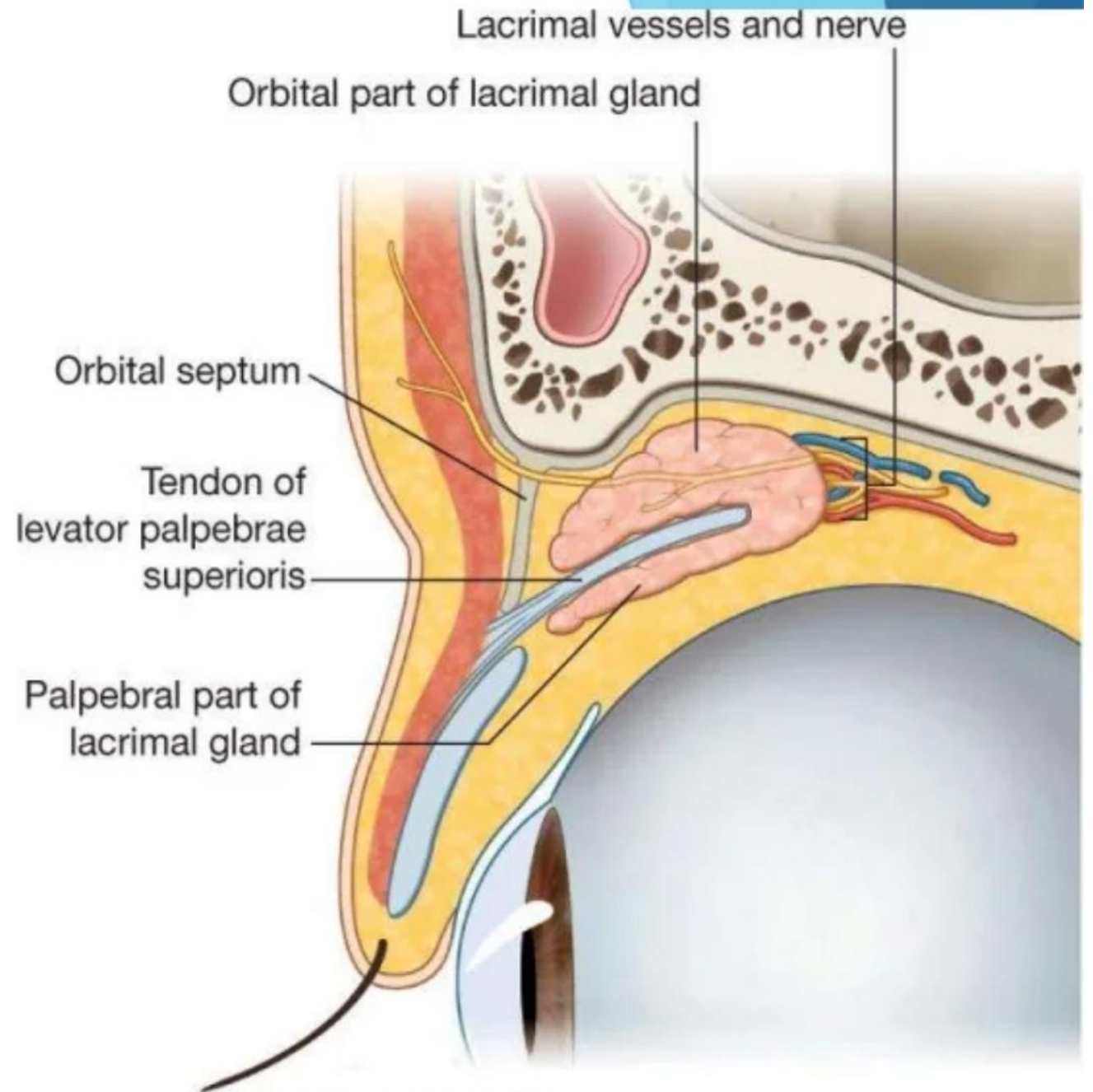
Inferior - lies on levator palpebrae superioris

The bones of the orbital complex



## 2. Palpebral part

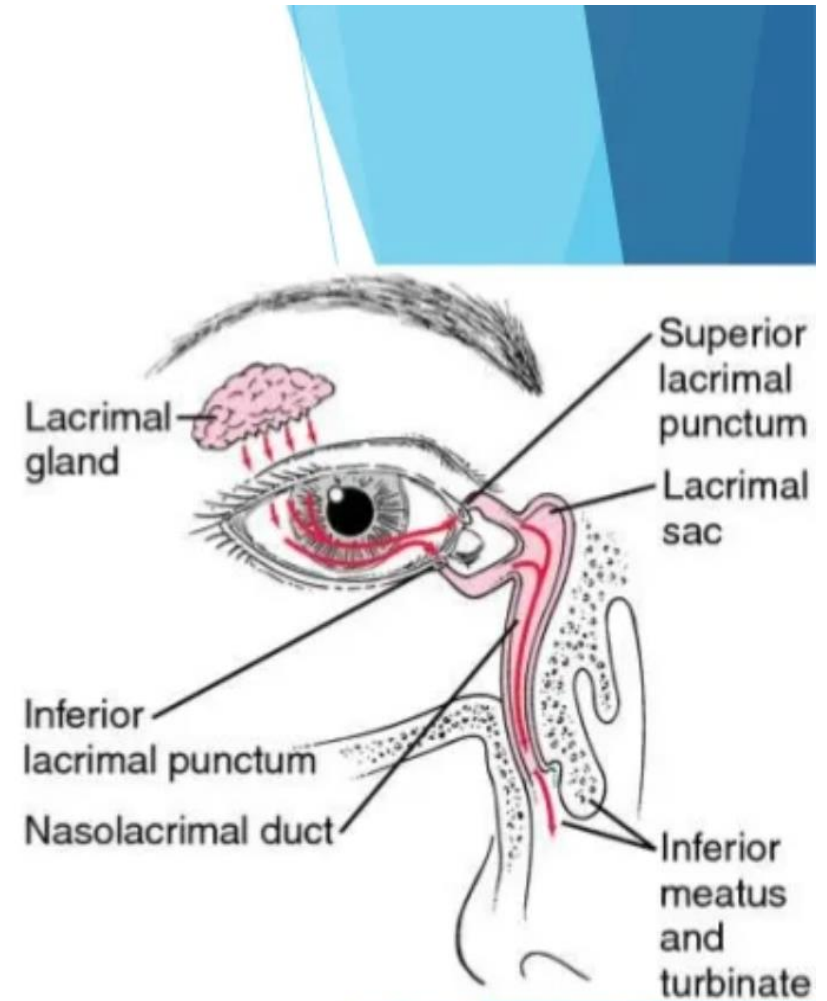
- consists of one or two lobule
- seperated by LPS muscle.
- Posteriorly-continuous with the orbital part.





## DUCTS OF LACRIMAL GLAND

- ✓ 10-12 ducts - open in the lateral part of superior fornix.
- ✓ One or two ducts also open in the lateral part of inferior fornix.



# ACCESSORY LACRIMAL GLANDS

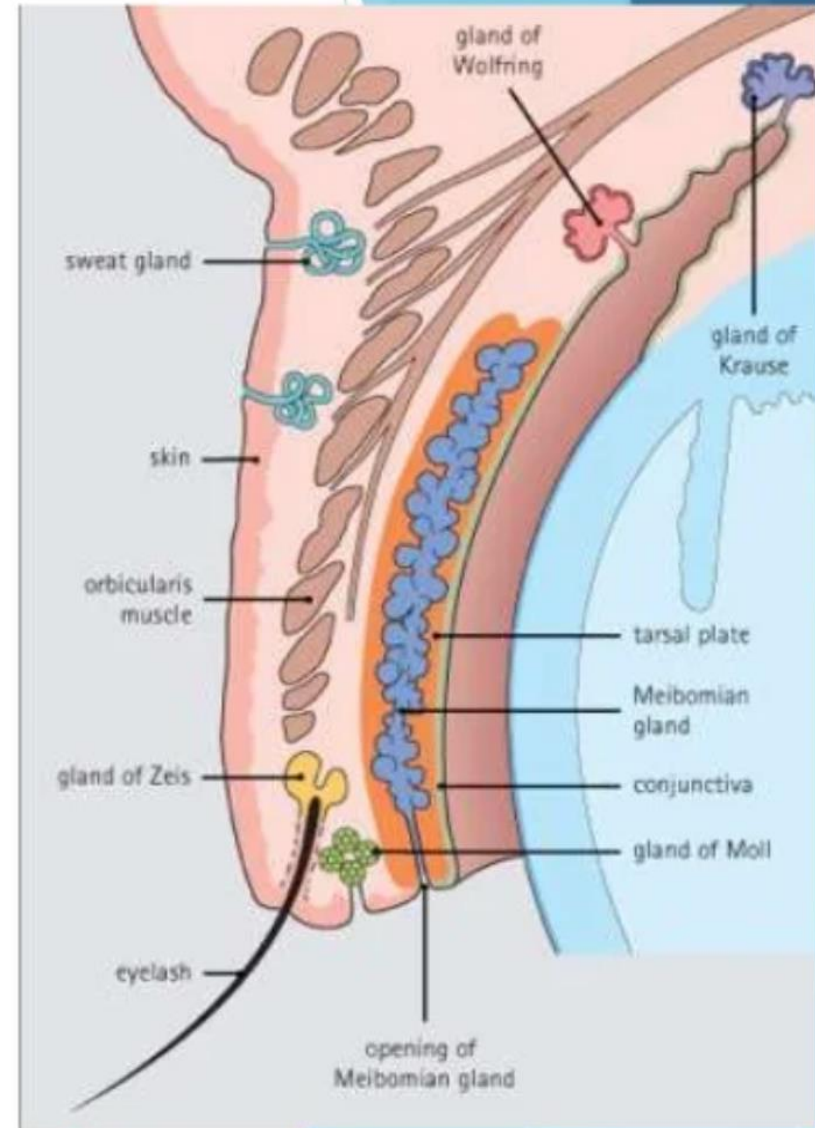
## 1. Glands of Krause

- lying beneath the palpebral conjunctiva between fornix and edge of tarsus.
- about 42 in the upper fornix and 6-8 in the lower fornix.

## 2. Glands of Wolfring

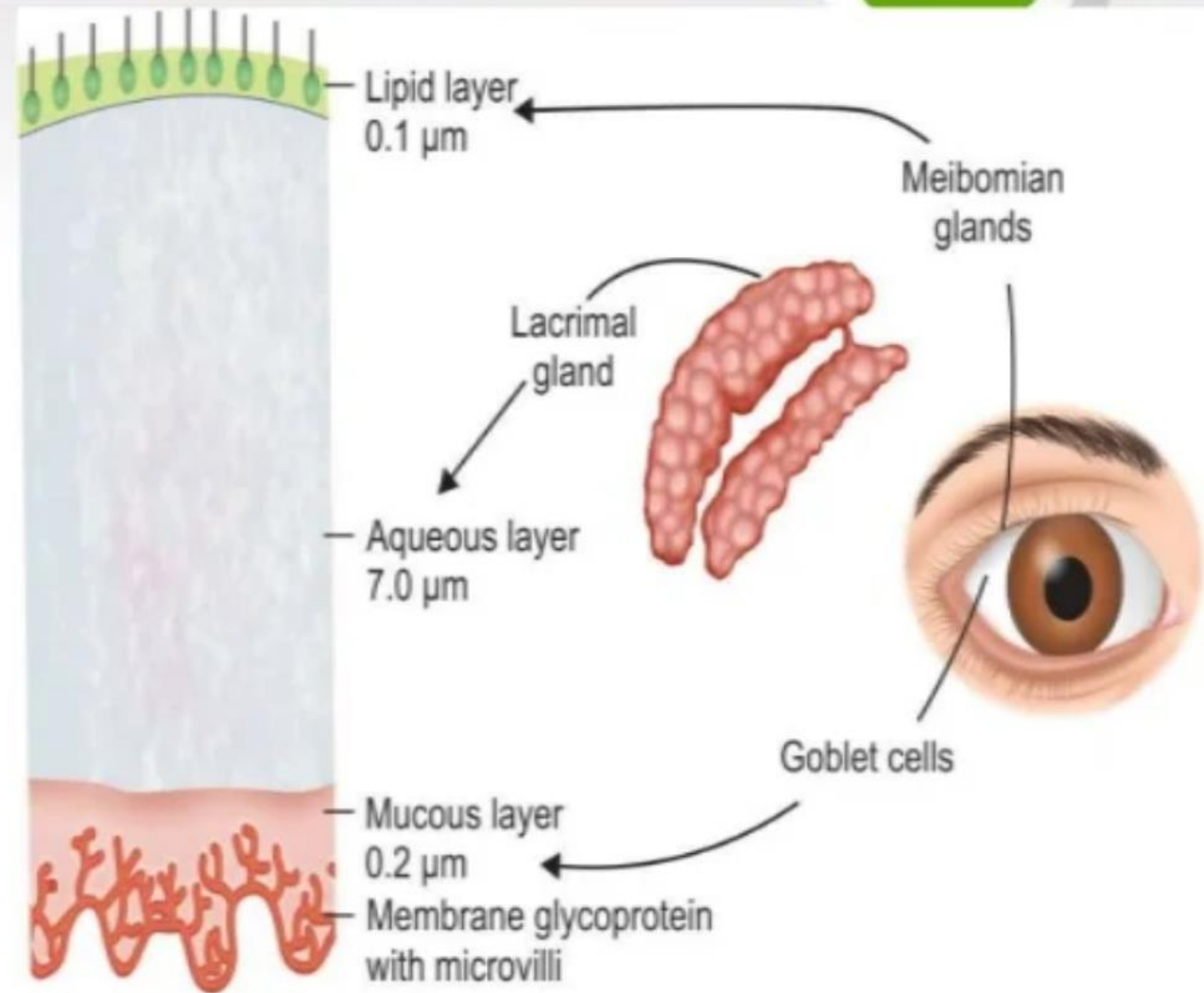
- present near the upper border of the superior tarsal plate and the lower border of inferior tarsus.

➤ All lacrimal glands – serous acini similar to salivary glands



# Tear Film

- Fluid covering the cornea and called it precorneal film.
- consist of three layers, which from posterior to anterior are mucus layer, aqueous layer and lipid or oily layer.



## 1. Mucus layer.



- It is the innermost and about 0.2 mm thick stratum of the tear film.
- It consists of mucin secreted by conjunctival goblet cells and glands of Manz.
- It converts the hydrophobic corneal surface into hydrophilic one.

## 2. Aqueous layer.

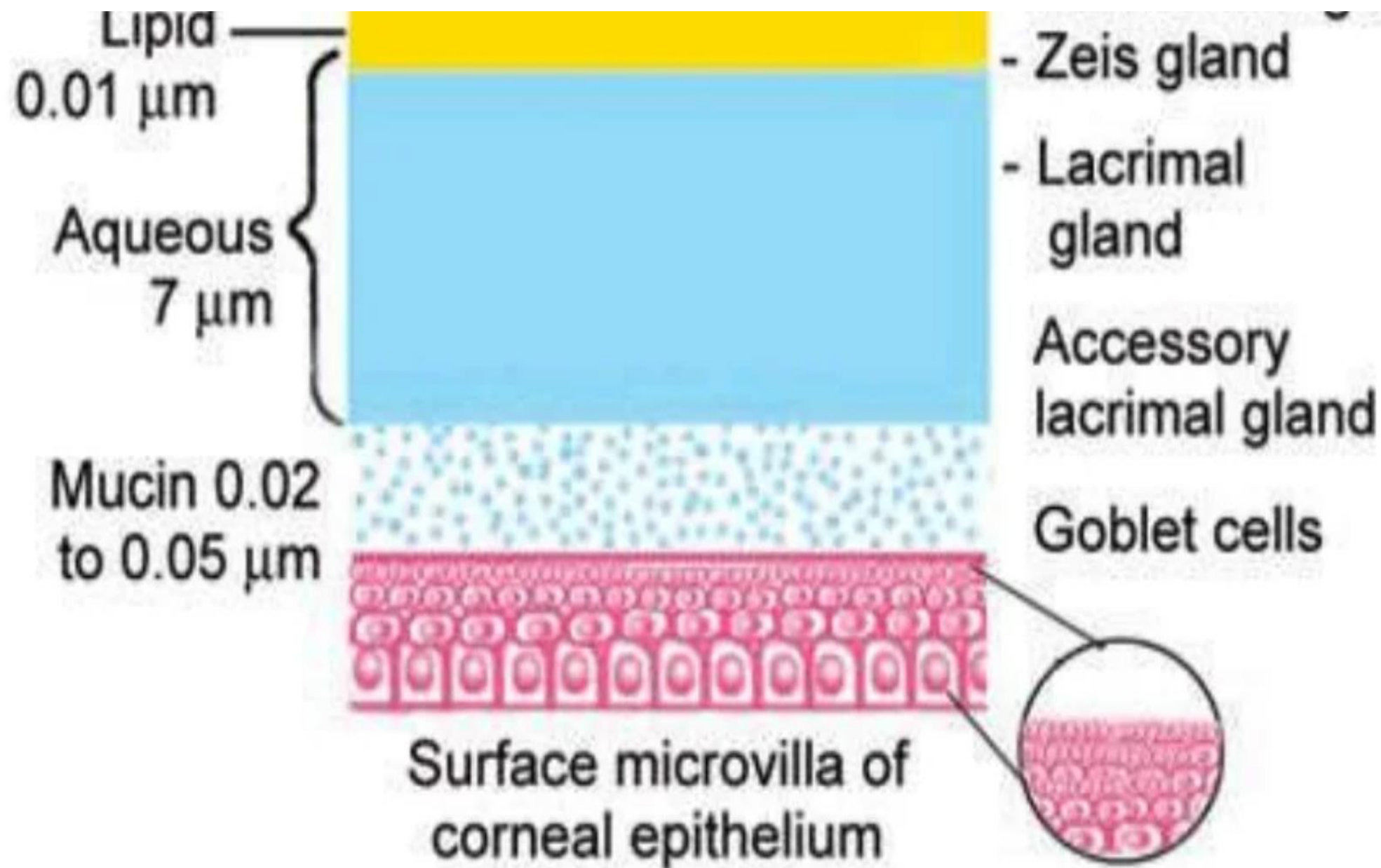


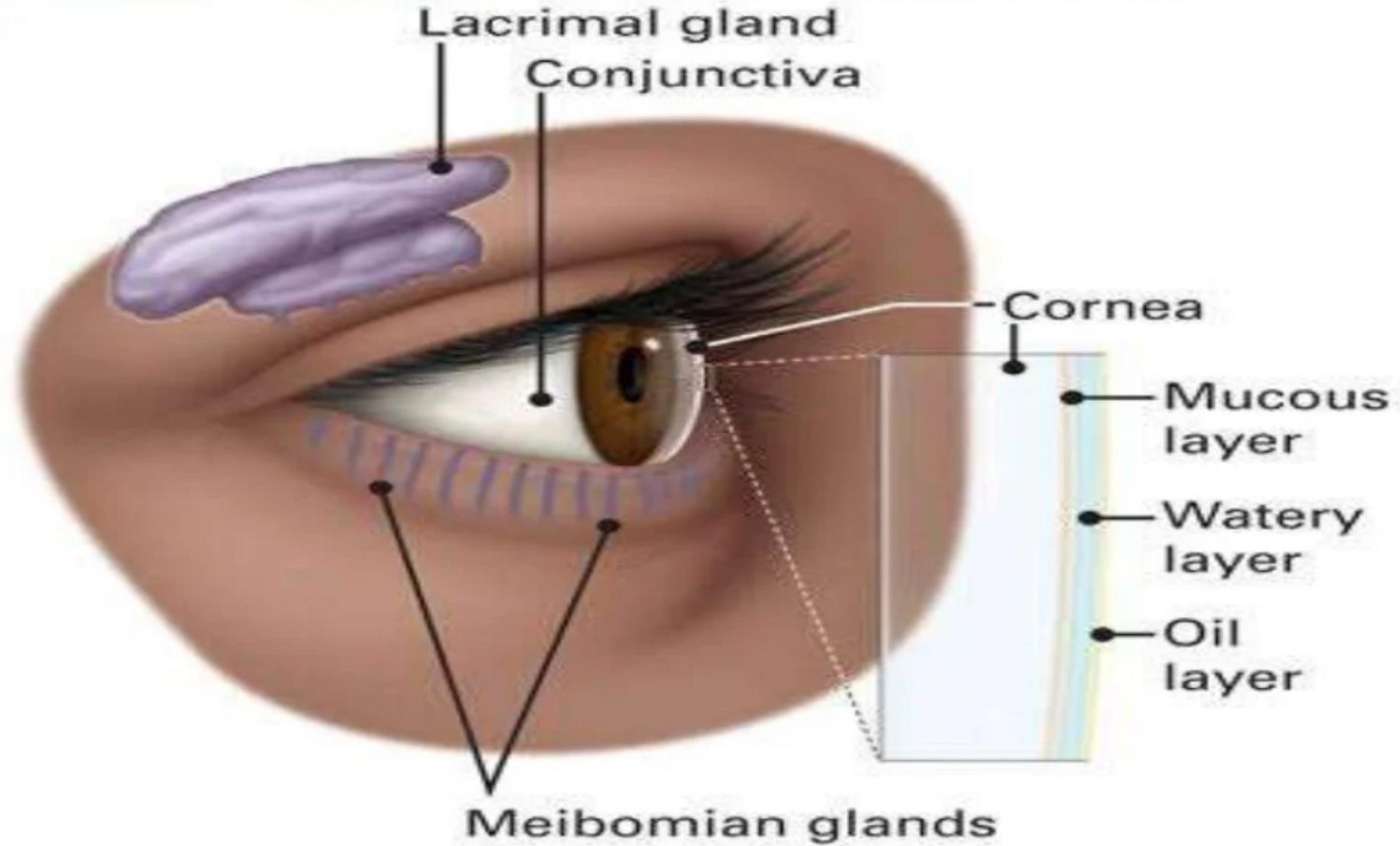
- The bulk of tear film (7.0 mm) is formed by this intermediate layer which consists of tears secreted by the main and accessory lacrimal glands.
- The tears mainly comprise of water and small quantities of solutes such as sodium chloride, sugar, urea and proteins.
- Therefore, it is alkaline and salty in taste. It also contains antibacterial substances like lysozyme, betalysin and lactoferrin.

### 3. Lipid or oily layer.



- This is the outermost and thinnest (0.1 mm) layer of tear film formed at air-tear interface from the secretions of meibomian, zeis, and moll glands.
- This layer prevents the overflow of tears, retards their evaporation and lubricates the eyelids as they slide over the surface of the globe









*Thank You*