

# Tear Fluid

Tear fluid, also known as **\*lacrima fluid\***, is a transparent liquid produced mainly by the lacrimal glands. It forms the tear film that covers the ocular surface and is essential for eye health and vision.

## Composition

Tear fluid is composed of three distinct layers:

- **Lipid layer (outermost):** Secreted by Meibomian glands; prevents evaporation of the underlying aqueous layer.
- **Aqueous layer (middle):** Secreted by lacrimal glands; contains:
  - Water
  - Electrolytes (Na<sup>+</sup>, K<sup>+</sup>, Cl<sup>-</sup>)
  - Proteins (e.g., lysozyme, lactoferrin, secretory IgA)
  - Glucose and urea
- **Mucin layer (innermost):** Secreted by conjunctival goblet cells; facilitates even spread of tears over the cornea and improves adherence.

## Functions

- Lubricates the ocular surface
- Provides nutrients to the avascular cornea
- Offers antimicrobial protection (lysozyme, lactoferrin, IgA)
- Removes debris and foreign particles
- Maintains a smooth refractive surface for optimal vision

## Clinical Relevance

- **Dry eye disease (keratoconjunctivitis sicca):** Results from reduced quantity or altered quality of tear fluid.
- **Tear film breakup time (TBUT):** A test to evaluate tear film stability; shorter times suggest instability.
- **Tear osmolarity:** Elevated osmolarity is a hallmark of dry eye disease.
- **Tear biomarkers:** Emerging research investigates the diagnostic potential of tear components for systemic and ocular diseases.

## References

1. Pflugfelder SC, Stern ME. **\*Tear film dysfunction: A commonly unrecognized cause of ocular surface inflammation\***. Am J Ophthalmol. 2020.
2. Bron AJ, et al. **\*TFOS DEWS II report\***. Ocul Surf. 2017.

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