

## The structure of the lipid layer of the tear film

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Dry eye disorders affect about 15% of older Americans and are poorly understood. Increased evaporation is an important contributing factor. The superficial lipid layer of the tear film is normally an excellent barrier to evaporation but its effectiveness is often reduced in dry eye disorders. This lipid, called meibum, is secreted from meibomian glands in the lids.

The main components of meibum are wax esters and cholesteryl esters with smaller quantities of polar and other lipids. Also, surfactant proteins probably play an important role. The esters often contain a proportion of long, saturated hydrocarbon chains which are thought to help increase resistance to evaporation. Another important characteristic of the lipid layer is its ability to withstand the blink cycle which causes compression to a small fraction of the original area, followed by expansion. Lipids with long, saturated hydrocarbon chains often do not re-spread to their original state after compression and expansion, so the inclusion of unsaturated hydrocarbon chains in meibum may aid in respreading after a blink.

The molecular organization of the lipid layer is poorly understood. The team will be asked to consider and propose models of molecular structure of the lipid layer, and to evaluate their consistency with observed properties which will be presented.

### References:

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