

Treatment for Chronic Dry Eye Syndrome

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Technology description

The Challenge:

Chronic dry eye syndrome (CDES) is one of the most common ocular problems. Although a number of etiologies result in CDES, the condition arises from a disruption of the pre-ocular tear film leading to either reduced tear production or excess tear evaporation. The human tear film is essential for normal eye function. Mild deficiencies of tears produce a subjective foreign body or gritty sensation, while more severe deficiencies can lead to epithelial defects, corneal dryness, and vision loss. While the most common cause of tear deficiencies are autoimmune diseases, the majority of patients with CDES due to excess tear evaporation suffer from meibomian gland dysfunction resulting in lipid tear deficiency. The meibomian glands in the eyelids produce the oily lipid layer that reduces evaporation of tears. Currently treatment options include many commercially available over-the-counter artificial tear formulations and one pharmacological agent aimed at immune associated CDES. Although, a number of products are in development there is a clear need for artificial tears that mimic essential properties of human tears.

Technology to be Commercialized:

Meibomian secretions are composed of a heterogeneous lipid mixture, which forms a protective lipid surface that maintains the integrity of the tear film. This invention provides an aqueous formulation of artificial tears based on the natural lipids of the meibomian secretions. The inventors have identified at the molecular level the genes and corresponding enzymes that produce the lipid components of human tears. In addition, they have developed an expression system and purification protocol of these lipids. Furthermore, the potential exists to precisely control the physiological properties of these lipids.

Market Overview:

As one of the most common ocular problems there is a clear market opportunity for this technology. In the United States alone, 5.5 million individuals suffer from some form of chronic dry eye. In addition, with only one product currently on the market there is significant potential for other treatment options. Thus, the market is still in its infancy with substantial growth opportunity. Frost and Sullivan estimate that although the market was nearly \$200 million in 2005 they forecast a \$1.5 billion market by 2012.

Institution

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