Lacritin-incorporated nanoparticles as new and improved treatment of dry eye disease

Project period
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Financing
OsloMet – Oslo Metropolitan University
Oslo University Hospital

Project owner
Faculty of Health Sciences (HV)
Department of Life Sciences and Health

Project manager
Sanko Nguyen

No effective treatment exists for severe forms of dry eye disease (DED). We are developing the protein lacritin, which is found in tears, to become a medicine for dry eye disease.

Due to the protein structure, the development of lacritin into a drug product is pharmaceutically challenging. Lacritin can easily degrade in the production process or in the body, thus losing its therapeutic effect.

Moreover, the main challenge with administrating medications to the eye is the short contact time of the drug with the eye.

In this project, we are preparing small particles in the nano size range to function as drug delivery systems for lacritin. Entrapped in nanoparticles, lacritin can be delivered to the eye in a safer and more efficient way.

We are also developing cellular assays in order to assess the stability and activity of lacritin both in free form and when entrapped in nanoparticles.

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More about the project

Dry eye disease is a multifactorial syndrome, characterized by symptoms of dryness and irritation of the ocular surface due to alteration in the quality or quantity of tear film.

It has been estimated that between 5 percent and 50 percent of the population at different ages suffer from DED making it one of the most common ocular conditions.

At the time of writing, there is neither a definite cure, nor effective treatment for severe forms of DED. The endogenous tear glycoprotein lacritin is currently viewed as perhaps the most promising approach to treatment of major forms of DED.

Lacritin is mainly secreted by the meibomian gland, but also by epithelial cells of the conjunctiva and cornea. The multifunctional role of lacritin has raised the possibility of its useful clinical application for topical treatment of DED if efficient and safe delivery systems can be developed.

This undertaking forms the main theme of the ongoing project.

Partner institutions

Oslo University Hospital