

Development of new carriers to improve the bioavailability of topical formulations to treat ocular surface inflammatory diseases

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Summary

The main goal of this research project is to investigate and develop an efficient delivery system for natural occurring compounds; that would be applied for the treatment of ocular surface disorders. Apart from the host institution, Institute of Applied Ophthalmobiology (University of Valladolid, Spain), part of the research activity will be done at the University of Eastern Finland in Kuopio and in a spin off company, HGBeyond, in Spain. Therefore, our global aim is to develop new medicines to treat inflammatory ocular surface diseases, such as dry eye disease and others.

State-of-the-art

Eye drug delivery is a challenging field. Conventional topical formulations possess some limitations that are due to the normal physiological processes occurring in the eye (blinking, tearing...). Those limitations reflect in the low bioavailability of the therapeutic agent and the need to apply the formulation several times a day, which in consequence lowers the compliance of the patient. In order to overcome these problems, the formulations should be carefully designed, to smartly meet the unmet needs present in this field.



Observation of the cells under the inverted microscope

Techniques

During the research project different techniques will be used:

- Dynamic Light Scattering
- UV-Vis Spectroscopy
- Cell Laboratory with annexed equipment
- Fluorescent microscopy

Task description

As a part of the project different task will be performed:

- Preparation of the different Drug Delivery Systems (DDS)
- Loading of the DDS with the natural compounds of interest and perform their physicochemical characterization
- Different bioassays on ocular surface cell lines (cytotoxicity, cell penetration, etc.)