



## PhD in Materials Engineering - Advanced Materials and Processing

Research Area: Biomaterials

**Title:** Development of a new drug delivery systems based on ophthalmic lenses

The development of new ophthalmic drug delivery systems that enhance the ocular bioavailability of drugs relatively to conventional administration forms (eyedrops) is a challenging task that has attracted the attention of many researchers in recent years. This work aims to evaluate the potential of novel approaches to control the drug release from commercial soft contact lenses and intraocular lenses, based on surface modifications of the materials. Lenses will be loaded with different drugs and coated/surface modified following several strategies, in order to achieve a gradual drug release. The release profiles will be determined in conventional sink conditions and in conditions that aim to mimic those found in the eye, and will be optimized using mathematical modelling/simulation. Microbiological tests will allow to infer about the activity of the released drugs. An extensive characterization of the materials will be done before and after the modifications, to evaluate eventual changes in their properties.

The work will be carried out at Instituto Superior Técnico (CQE), Instituto Universitário Egas Moniz (CiiEM) and Universidade de Santiago de Compostela.

**Keywords:** contact Lens, surface modification, drug delivery, sterilization

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**Start Year:** 2016