

Annotation of Doctoral Thesis Topics for Degree Programme: Material Sciences and Engineering, course in „Biomaterials and Biocomposites“ for the Academic Year 2019/2020

Topic:	Biological evaluation of cosmetic and pharmaceuticals active ingredients
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Annotation:

Safety and efficacy of cosmetic products relies on the interaction of active ingredients and final formulations with live objects in terms of individual cells, body fluids, and physiological systems. The study of interactions between the products and cells or reconstituted tissues, via selected in vitro methods, will therefore provide a basic knowledge needed for the preparation of safe products. The preparation of topical formulations for dermatological and cosmetic applications and subsequent evaluation of their biological properties using various in vitro techniques are two main aims of the PhD. study.

Within the PhD. thesis, the topical formulations will be prepared by encapsulation of active substances into the polymeric carriers. The utilization of both synthetic biodegradable polymers as well as biopolymers is planned.

The in vitro testing of biological properties will be mainly focused on the determination of cytocompatibility, oxidative stress, anti-inflammatory activity, skin sensitization, skin irritation or interaction with the blood. Mentioned biological properties will be studied in the context of product composition and technology of its preparation with the aim to significantly enhance the knowledge on the correlation between the material behaviour and its biological properties.

Requirements:

Creative abilities, skills for working in laboratory.

Literature:

1. Cell Biology: A Laboratory Handbook, Four Volume Set. Publisher: Academic Press, 3 edition (July 18, 2005). ISBN-10: 0121647307.
2. Culture of Animal Cells: A manual of Basic Technique. Publisher: Wiley-Liss; 5 edition (July 29, 2005) ISBN-10: 0471453293.
3. Culture of Cells for Tissue Engineering. Publisher: Wiley-Liss; 1 edition (February 3, 2006) ISBN- 10: 0471629359.
4. Molecular Biology of the Cell. Publisher: Garland Science; 5 edition (2007) ISBN-10: 0815341059.