Description of the position: PhD student

Job description:

Our profile

Our international research group is focusing on the development and processing of new biomaterials for advanced biomedical systems and tissue engineering. Soft hydrogels are designed with controlled biochemical and mechanical properties and complex, hierarchical structures to mimic the extracellular matrix architectures. Within this scope, the Anisogel enables the creation of an oriented structure after injection, resulting in aligned cell growth due to the mechanical anisotropy of the material.

Your tasks

The main objective is to engineer a fully poly(ethylene glycol) (PEG)-based Anisogel for various tissue models with optimized, application-specific mechanical and biochemical properties and degradation rate. Using established methods, a library of magneto-responsive rod-shaped microgels and short fibers will be produced with different dimensions, aspect ratios, chemistries, cell adhesive ligands, stiffness and surface topographies. Cells will be mixed inside the hydrogel solution and, after orientation, the effect of the 3D mechanical anisotropy, created by the different material design parameters, will be analyzed on epithelial cell migration and stem cell differentiation.

In-mold polymerization and an electrospinning/microcutting technique will be applied to generate a library of anisometric elements. Their properties and functionality will be tested using atomic force and STED microscopy, cell culture experiments and immunostainings. The mechanical properties of the surrounding hydrogel will be optimized via rheology and specific biological ECM fragments will be produced in E. coli.

Requirements / profile: Your profile

The ideal candidate will be an ambitious, highly-motivated, team-oriented graduate in natural sciences (biology, physics, chemistry, medicine, biomedical engineering or similar) with a strong interest in multidisciplinary research on mechanobiology and innovative materials. Proficiency in scientific communication, data analysis, and advanced English language skills are required; prior experience in the design and use of hydrogels for cell culture is appreciated but no prerequisite.

Pay category: TV-L 13 (65%)

Hiring date: from July 01, 2019

Duration of employment: limited until June 30, 2022

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Equal career prospects for women and men.

Severely disabled applicants with equal qualification will be given preferential consideration.

Application deadline: March 31, 2019