



SFB1425 - Heterocellular Nature of Cardiac Lesions: Identities, Interactions, Implications

P11-1: PhD-Project

based at the

Institute for Experimental Cardiovascular Medicine

Nano-Structural Basis for Mechanical Fibroblast-Cardiomyocyte Cross-Talk

Background

In the heart, the ubiquitous network of collagen fibres, produced by fibroblasts (FB), provides a scaffold for structural and mechanical integration of cardiomyocytes (CM). However - while necessary for the initial repair following injury - excessive collagen deposition over time can impair cardiac function. In this project we want to understand how nano-structural CM-FB communication drives collagen deposition during heart disease, and how this process can be modulated for patient benefit.

Project Description

Advanced light- and electron-based imaging as well as biochemical approaches will be used to understand the role of tunnelling nanotubes (TNT) in FB-CM communication and collagen deposition. You will use and develop new approaches towards live cell imaging and measurement of mechanical properties of TNT, imaging and quantification of collagen deposition, and implementation of pharmacological, genetic, and environmental anti-fibrotic strategies.

Qualifications and Requirements

- High motivation to work on a state-of-the-art research topic in a highly dynamic, interdisciplinary and supportive environment
- Solid background in cardiac and/or cellular physiology and biophysics
- Prior experience in the handling of biological models, as well as in molecular and optical engineering would be desirable
- Excellent MSc in a field relevant for the proposed study
- English language proficiency at level B2 or higher

Research Areas

Cell Biology, Biophysics

Experimental Tasks

- Live cell imaging and manipulation
- Biophysical and molecular characterisation of inter-cellular interactions
- Development of methods for pre-clinical applications

Student Background

Biophysics, Biochemistry, Biology, (Molecular) Medicine, Biomedical Engineering (or related)

Starting Date

from 01/07-2020

PhD Advisor

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Joint project with Alexander Rohrbach, IMTEK

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Applications via

[SGBM portal](#)

Submission window: 08-30/06-2020