



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

P03: PhD-Project

based at the

Institute of Experimental and Clinical Pharmacology and Toxicology

Transcriptional Mechanisms of Atrial Remodelling and Arrhythmia

Background

Atrial fibrillation is the most frequent cardiac arrhythmia. Structural and electrophysiological remodelling of the atria are two main hallmarks of atrial fibrillation, resulting in stasis of blood and a pro-thrombotic state, increasing the risk of ischaemic stroke. Several signalling pathways and transcriptional mechanisms play an important role in cardiac remodelling. We aim to identify these signals, their cell type-specific molecular and epigenetic mechanisms in experimental models and in human atria.

Project Description

The main goal of this project is to identify molecular, transcriptional, and cellular mechanisms of atrial remodelling and arrhythmia. The underlying epigenetic mechanisms will be studied in genetically modified models and will be translated to human atrial fibrillation. Specific cell types or nuclei will be isolated from cardiac tissue and genome-wide RNA profiles, histone modifications, transcription factor binding and DNA methylation will be identified and analysed by advanced bioinformatic methods. Epigenetic mechanisms involved in atrial remodelling will be targeted pharmacologically, by siRNA- and CRISPR/Cas9 or by genetic engineering.

Qualifications and Requirements

- High motivation to work on a state-of-the-art research topic in a highly dynamic, interdisciplinary and supportive environment
- A solid background in cardiovascular physiology, epigenetics and molecular biology, or bioinformatics would be desirable
- Excellent MSc in a field relevant for the proposed study
- English language proficiency at level B2 or higher

Research Areas

Epigenetics, Molecular Medicine

Experimental Tasks

- State-of-the-art cardiac physiology in experimental models
- Cell/nuclei sorting and next generation sequencing
- Bioinformatic analyses

Student Background

Molecular biology, cardiac physiology, pharmacology, (molecular) medicine (or related)

Starting Date

from 01/07-2020

PhD Advisor

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