



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

## P14: PhD-Project

based at the

**Life&Brain Center, UKB, Medical Faculty, University of Bonn**

### ***Modulation of Cx43 Expression and Targeting of the Myocardial Scar: Impact on Cell Fate, Scar Formation, and Electrical Vulnerability Post-MI***

#### **Background**

Ventricular tachycardia (VT) is a frequent and potentially lethal complication of myocardial infarction (MI). We have shown that engraftment of Connexin 43 (Cx43) positive muscle cells or lentiviral-based Cx43-transduction of resident myofibroblasts (mFB) in the scar reduces post-MI VT incidence in mice *in vivo*. This effect is most likely achieved by altering conduction properties in the scar and/or its border zone. Scope of the present project is to explore the protective mechanism(s) underlying Cx43 (over-)expression in the myocardial scar, its potential adverse effects, and also novel approaches to target the cardiac scar area by gene therapy. Our long-term goal is to establish a novel biological treatment option to prevent post-MI VT.

#### **Project Description**

We have generated a genetic mouse model enabling the inducible overexpression of Cx43 in mFB of the scar area post-MI. We will use different cardiac lesion models and test the impact of mFB-specific Cx43 overexpression on post-MI VT incidence *in vivo*. In addition, we will also test as a translational approach different viral vectors in combination with magnetic nanoparticles to achieve robust and site-specific transduction of the cardiac scar.

#### **Qualifications and Requirements**

- High motivation to work on a state-of-the-art research topic in a highly dynamic, interdisciplinary and supportive research environment
- Background in Molecular- and Cell Biology or Physiology
- Prior experience in the handling of animals and cell culture techniques would be desirable
- Excellent MSc in a field relevant for the proposed study
- English language proficiency at level B2 or higher

#### **Research Areas**

Experimental Medicine & Surgery, Cardiac Cell biology, Physiology, Nanomedicine;

#### **Experimental Tasks**

- Animal experiments incl. generation of cardiac lesions, physiological analysis *in-* and *ex vivo*
- Cell- and Molecular Biology, Histology
- Nano-based targeted gene transfer using viruses;

#### **Student Background**

Cell-/Molecular Biology, Experimental medicine, Physiology, Veterinary Medicine, Physiology, Pharmacology

#### **Starting Date**

from 01/07-2020

#### **PhD Advisor**

Wilhelm Röhl, Dept of Cardiac Surgery, UKB, University of Bonn  
[wroell@uni-bonn.de](mailto:wroell@uni-bonn.de)

Joint project with Bernd Fleischmann, Life&Brain Center, Bonn

#### **Contact**

[info@sfb1425.uni-freiburg.de](mailto:info@sfb1425.uni-freiburg.de)

#### **Applications via**

[SGBM portal](#)

Submission window: 08-30/06-2020