



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

P08: Two PhD-Projects

based at the

Department of Cardiology and Angiology I

The Impact of Heterogeneous Macrophage Origins on Ischaemic and Non-Ischaemic Cardiac Lesions

Background

Although macrophages (M Φ) account for only 5-10% of cells in the healthy heart, they importantly engage in immune defense and phagocytosis, the development of the coronary circulation, and electrical conduction. Derived from embryonic precursors, resident M Φ self-sustain into adulthood, but are complemented/ replaced by recruited monocytes over time and in particular following cardiac injury. While complete M Φ depletion is detrimental, reducing their numbers by limiting monocyte invasion improves infarct healing. This ambiguity apparently depends on cell ontogeny with resident M Φ providing cardioprotection and recruited M Φ promoting damage. Unraveling the underlying mechanisms is the focus of studies.

Project Description

Transgenic mouse models and human tissue samples will be used to decipher the spatio-temporal kinetics and intercellular relationships of resident and recruited M Φ when they accumulate side by side in the tissue, interacting with other cardiac cell types in ischaemic and non-ischaemic cardiac lesions. We will study differences in inflammation, phagocytosis, electrical coupling and further interactions of resident and recruited M Φ with other cardiac cell types. By decoding M Φ heterocellular crosstalk we aim at identifying potential therapeutic targets for immune-modulation of cardiac lesions.

Qualifications and Requirements

- High motivation to work in an interdisciplinary team mastering a wide range of techniques
- Solid background in immunology research
- Prior experience in the handling of experimental animals, especially mice, as well as in molecular biology techniques such as flow cytometry and PCR/RNA sequencing would be desirable
- English language proficiency at level B2 or higher

Research Areas

Immunology, Cardiac Physiology

Experimental Tasks

- Mouse models of cardiac injury and inducible Cre/lox system
- FACS, immunohistology, RNA sequencing, cell cultures
- In collaboration within the CRC whole heart/ single cell electrophysiology and electromechanic measurements.

Student Background

Biophysics, Biochemistry, Biology, (Molecular, Veterinary) Medicine

Starting Date

from 01/07-2020

PhD Advisor

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Applications via

[SGBM portal](#)

Submission window: 08-30/06-2020