PhD Position: MRI-Method-Development for Preclinical Cardiac and X-Nuclei Imaging (m/f/d)

Join a translational research team developing quantitative MRI methods for preclinical cardiac imaging at 7 T. This position offers hands-on sequence development, X-nuclei imaging (^{23}Na and ^{19}F), and direct integration of MRI physics with cardiovascular and immunological research.

Institutions: Experimental Physics 5, University of Würzburg & Comprehensive Heart Failure Center Würzburg (CHFC)
Location: Würzburg, Germany
Employment: 75% TV-L E13, fixed-term (3 years)
Start date: March-June, 2026, Position will be filled

Supervision / Team Members: Dr. FT. Gutjahr (EP 5), Dr. M. Christa (Med I, CHFC), Prof. Dr. Dr. WR Bauer (Med I, CHFC), Keshtkar Mohammedreza (CHFC)

Project

This DFG-funded project investigates how high sodium intake affects myocardial healing and immune response after infarction. Elevated tissue sodium is a potential modulator of inflammatory processes, and we aim to clarify its influence on macrophage recruitment, inflammation, and cardiac remodeling.

The PhD candidate will further develop and optimize MRI methods, focusing on quantitative X-nuclei MRI methods (^{23}Na and ^{19}F) to extend our preclinical cardiac research protocols on a 7 T preclinical MRI system. The goal is to provide a robust framework for longitudinal assessment of myocardial remodeling and to correlate the cardiac sodium content with the immune cell infiltration.

Responsibilities

- Design, implement, and optimize quantitative 3D ^{23}Na imaging
- Implement phase-sensitive B_1 mapping for improved sodium quantification
- Establish multicolor ^{19}F MRI for assessment of immune cell infiltration
- Develop and standardize reconstruction and quantitative analysis workflows
- Conduct simulations and phantom experiments
- Perform hands-on in vivo MRI experiments in mouse models

Depending on your interests and strengths, the project can be expanded toward advanced reconstruction methods, data-driven techniques, or combined ^{1}H/X-nuclei reconstruction strategies.

The position is embedded in a translational research environment at the interface of physics, cardiology, and immunology. The candidate will work closely with physicists, veterinarians, and clinicians and contribute to the further development of the local X-nuclei MRI platform.

Candidate Profile:

We are looking for a highly motivated candidate with a Master's degree in Physics, Biomedical Engineering, Electrical Engineering, Computer Science, or a related technical field. You should have a strong interest in MRI physics, a passion for hands-on experimental work, and proficiency in programming (e.g., MATLAB, Python). The ideal candidate is capable of working independently while thriving in an interdisciplinary team. Prior experience with MRI sequence development, image reconstruction, or quantitative imaging is a plus. Good English skills are mandatory; German proficiency is advantageous.

We offer

- Collaborative research environment bridging physics, cardiology and immunology
- Affiliation with the GSLS for structured doctoral training and networking
- Clear milestones and close supervision.
- Direct access to and active development on a 7 T preclinical MRI system with established cardiac workflows
- Opportunities to contribute methodologically and help shape the local X-nuclei MRI infrastructure
- Support for conference attendance and scientific publication

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Application

Applications from international candidates and all genders (m/f/d) are explicitly encouraged. Please send your application, including CV, short motivation statement, academic transcripts, and a one-page description of your Master thesis or similar Project, to **Fabian.Gutjahr@uni-wuerzburg.de**. Please feel free to contact Dr. Gutjahr in case of any questions or inquiries regarding the position.

Review of applications starts immediately and continues until the position is filled.

Please note that by submitting your application, you consent to the processing of your personal data by the University of Würzburg for the purpose of the application process. For further information on the legal basis and data usage, please refer to the university's data protection policy (https://www.uni-wuerzburg.de/sonstiges/datenschutz/).