

PhD students (m/f/d) in the field of biomedicine, medical physics, imaging, data science or related comparable

Team:

[Prof. Thoralf Niendorf](#)

Working place:

MDC Berlin-Buch

Arbeitsort:

MDC Berlin-Buch



scope of employment:

Full time

Application deadline:

31. March. 2022

Contact:

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Equal opportunities:

MDC is committed to diversity and actively promotes equal opportunities for all employees regardless of origin, religion, worldview, health impairment, age or sexual identity. We welcome applications from open-minded people who enjoy working in diverse teams. Applications from severely disabled persons will be given special consideration.

For applying:

Please submit your application via our online portal (<https://www.mdc-berlin.de/career/jobs/phd-studentstudentin-mwd>) with a letter of motivation, curriculum vitae (without photo, age and information about your marital status) and other relevant attachments.

The Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC) is one of the leading international biomedical research centers. At the MDC, researchers from around 60 countries analyze the human system - the fundamentals of life from its smallest building blocks to cross-organ mechanisms. Understanding what controls or disturbs the dynamic equilibrium in a cell, an organ, or the entire body can help prevent diseases, diagnose them early, and stop them with tailored therapies. The findings of basic research should quickly benefit patients.

The Experimental Ultra-High Field MR group, headed by Professor Thoralf Niendorf, is seeking 2 PhD students with a background in biomedicine, medical physics, or engineering, preferably with a prior experience in cardio MRI (CMR). The students will be involved in the project "Non-invasive Monitoring of Hypertrophic Cardiomyopathy using Cardiac MRI to track the kinetics of myocardial microstructural changes and to predict disease progression in Hypertrophic Cardiomyopathy (HCM)." Both candidates will be deeply involved with preclinical MRI data acquisition and analysis, in conjunction with Artificial Intelligence (AI) and Data Science. A strong motivation to uncover new pathological insights in the HCM animal model is a requirement for PhD1. A requirement for PhD2 is a strong incentive to drive CMR in the HCM model and the interpretation of its data with the help of state-of-the-art methods in AI and data sciences. Both PhD students will collaborate with scientists from the Experimental Pharmacology and Toxicology at the UKE in Hamburg, the Hasso Plattner Institute (HPI) in Potsdam and other involved partners.

Tasks for PhD1:

- Application of novel cardiac MRI methods using mouse model.
- Longitudinal evaluation and analysis of a cardiac disease kinetics using MRI.
- Application of microscopy and biochemistry methods to correlate with the imaging findings.
- Establishing a cardiac MRI phenotyping procedure for monitoring of disease kinetics in small animals.
- Quantitatively explore and correlate MRI imaging markers and histological parameters to detect interdependences across the whole cardiac disease course.
- Exploring the impact of pharmacotherapies on myocardial remodeling process
- Tightly working with PhD2. Collaboration with internal and external groups and presentation of own activity through presentations, reports and publications (papers and PhD thesis).

<https://www.mdc-berlin.de/career/jobs/phd-studentstudentin-mwd>

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Tasks for PhD2:

- Optimization (MRI pulse sequencing) of novel cardiac MRI acquisition for quantifying changes in small animals.
- MRI data analysis: applying spatial alignment and registration to correct the motion artifact of MRI data, contouring the desired regions of interest using computational tools.
- Cooperate with PhD1 to quantitatively explore and correlate MRI imaging markers and histological parameters to detect interdependences across the whole cardiac disease course.
- Determination of whether there is a statistically significant temporal relationship between imaging events in time series.
- Development of machine learning algorithms to predict disease progression using the data acquired in the HCM model.

Your qualifications:

- The ability to work in a team, pro-active learning, interdisciplinary thinking skills, high level of initiative and commitments
- University degree (diploma/master) in biology, biomedicine, physics, engineering or related field
- Hands-on experience with small rodents as research models (especially PhD1)
- General technical understanding and experimental skills
- Basic knowledge of cardiovascular related topics
- Basic knowledge of data processing
- Practical experience in acquiring and analysing MRI data is advantageous
- Experience with one or more programming languages such as Python, Matlab... (requirement for PhD2, advantageous for PhD1)

We offer

- Pleasant working environment
- Excellent supervision
- Outstanding research infrastructure
- Interdisciplinary research at the interface of medical, biomedical research, physics and data science
- National and international networks with universities and research institutes
- Pay scale in salary group 13 TVöD
- Full-time commitment