

# PhD Position

## New Contrast Mechanisms for Magnetic Resonance to Measure Blood Oxygenation

Medical Physics, Department of Radiology, University Medical Center Freiburg

### Who we are:

Hyperpolarization group Freiburg within the small animal research center (AMIR) at the Medical Physics, Dept. of Radiology (≈60 scientists)

Department Head:

Prof. Dr. Maxim Zaitsev

### Current Hyperpolarization Team:

1 PostDoc, 2 PhD Students  
(+ 2 open PhD positions)

### Visit our Website:



[www.uniklinik-freiburg.de/hyperpolarization](http://www.uniklinik-freiburg.de/hyperpolarization)

### More Information:

Opening date: July 12, 2022

Anticipated Start: Oct. 2022 – Mar. 2023

Planned PhD duration: 3 years

Location: Freiburg, Germany

### Application and Contact:

Please send your application (CV incl. publications & short cover letter) to Dr. Andreas Schmidt

([andreas.schmidt@uniklinik-freiburg.de](mailto:andreas.schmidt@uniklinik-freiburg.de))

or Prof. Maxim Zaitsev

([maxim.zaitsev@uniklinik-freiburg.de](mailto:maxim.zaitsev@uniklinik-freiburg.de)).

Feel free to get in touch with questions!



### Background:

Oxygen is the fuel of life and in its absence, most cells and organisms die within minutes. Many diseases are associated with compromised blood flow (hypoperfusion) and oxygen delivery (hypoxia), including neurodegenerative diseases. The Freiburg group focuses on the development of new methods and contrasts for MRI and MRS and bringing these advances to biomedical application with an ultimate goal of clinical translation. In a joint project together with the NMR Signal Enhancement Group of the Max Planck Society we are aiming at developing new approaches to study blood oxygenation and its changes in diseases. Techniques in our labs that will be applied include proton spectroscopy and potentially the use of signal-enhanced/hyperpolarized  $^{13}\text{C}$  probes.

### What we offer:

- Physics with biomedical application aiming at improving research, diagnostics, and monitoring of neurodegenerative diseases
- High-impact emerging field of research
- Part of the German Cancer Consortium (DKTK)
- National and international cooperation (visits supported)
- State of the art equipment and infrastructure (e.g., three preclinical Bruker 7T / 9.4T MRI systems; 7T PharmaScan, ParaVision 360, with volume transmitter, cryogenic surface mouse brain receiver)
- Competitive salary (fully funded 65 % TV-L E13 position)

### What you will be doing:

- Implementing and optimizing proton spectroscopy sequences
- Investigating relaxation effects in different (biological) media
- Collaborating with our partners from the MPI Göttingen and Cologne (S. Glöggler) to develop targeted, optimal MR sequences
- Preclinical experiments in healthy and diseased mice
- Optional: working with  $^{13}\text{C}$  hyperpolarization techniques

### What we expect: (M – must ; S – should ; N – nice to have)

- Master in Biology, Molecular Medicine, Life Sciences, or similar (M)
- Fluent English (M)
- Solid background in Cell / Molecular Biology, and Neuroscience (S)
- Work experience (e.g. from B.Sc./M.Sc. thesis) with
  - preclinical experiments (M)
  - data analysis (S)
  - programming (S)
  - Bruker MRI systems (N)

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