

## **One Postdoc and one PhD positions in “MRI-based in vivo Histology” and “Modelling Microstructure”**

Two positions are available (1 Postdoc, 1 PhD) in the Group “Quantitative MRI and in vivo histology” (PI: Siawoosh Mohammadi) at the Department of Systems Neuroscience, the Medical Center Hamburg-Eppendorf, Hamburg, Germany. The positions are supported by a DFG Emmy Noether Grant (similar to an ERC starting grant).

The successful candidates will be embedded in a unique research environment that combines state-of-the-art clinical MRI (3T Siemens PrismaFit in Hamburg) with cutting-edge MRI (access to human 7T and 3T Connectome at the MPI in Leipzig), advanced acquisition techniques (e.g. SLIDER-SMS for ultra-high resolution diffusion MRI), biophysical modelling of the MRI signal [1,2], and advanced histology (e.g. CLARITY) to validate MRI-based in vivo histology of human brain microstructure.

### **Main function**

The main responsibility of the candidates will be: (i) to conduct methodological research relating the MRI signal to tissue microstructure in the human brain (using *in vivo*, *in situ*, and *ex vivo* MRI as well as *ex vivo* histology), (ii) to compare the MRI between each other and to the *ex vivo* histology reference, (iii) to pursue excellence in research, publishing work in high-quality journals.

*Postdoc MRI:* The post holder will be engaged in his/her own research projects aiming to implement, improve, and develop ultra-high resolution MRI acquisition techniques (incl. diffusion MRI, relaxometry MRI, magnetization transfer imaging), image reconstruction, and combine these with advanced image processing methods (e.g. adaptive denoising and super resolution methods).

*PhD modelling:* The post holders will work closely together to develop, implement, and translate biophysical models of brain tissue microstructure using quantitative MRI modalities/methodologies and *ex vivo* histology.

### **Entry requirements**

A good degree in physics, medical physics, engineering, biomedical sciences, applied mathematics, or related disciplines, with a high final average. Candidates short-listed for interview will be required to give a short research presentation about their current projects and should make themselves familiar with the papers cited in this job ad.

*Postdoc MRI:* PhD degree in the above disciplines. Profound knowledge of MRI physics. Knowledge of IDEA sequence programming language and/or experience in image reconstruction.

*PhD modelling:* Master degree in one of the above disciplines. Extensive mathematical knowledge and particular expertise in modelling. Additional interest in modelling advanced *ex vivo* histology, e.g. CLARITY.

*Informal enquiries:* Please email Dr. Siawoosh Mohammadi for further information about the project and positions ([s.mohammadi@uke.de](mailto:s.mohammadi@uke.de)).

*Application procedures:* To apply, please include all documents in one PDF-file in the following order: CV, contact information for three references, a brief letter describing your personal qualifications, research interests and motivation for applying, copies of up to two of your most relevant publications. Please submit your application directly to [s.mohammadi@uke.de](mailto:s.mohammadi@uke.de).

More information can be found on our website: <https://goo.gl/NKCgKn>

## References

[1] Mohammadi S, Carey D, Dick F, Diedrichsen J, Sereno MI, Reisert M, Callaghan MF and Weiskopf N (2015), [Frontiers in Brain Imaging Methods, Whole-brain in-vivo measurements of the axonal g-ratio in a group of 37 healthy volunteers](#), 9: 00441, doi: 10.3389/fnins.2015.00441

[2] N Weiskopf, S Mohammadi, A Lutti, MF Callaghan (2015) [Advances in MRI-based computational neuroanatomy: from morphometry to in-vivo histology](#), Curr Opin Neurol. 28(4):313-22., doi: 10.1097/WCO.000000000000022