One Postdoc and two PhD positions in "Validating MRI-based in vivo histology"

Three position are available (Postdoc 3y, 2 x PhDs 3y) 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. All 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 study how tissue microstructure changes in response to cognitive training, (iii) to pursue excellence in research, publishing work in high-quality journals.

Postdoc: 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 holder will be engaged in developing, implementing, and translating biophysical models of brain tissue microstructure using quantitative MRI modalities/methodologies, such as diffusion MRI, relaxometry MRI, magnetization transfer imaging, as well as advanced ex vivo histology methods.

PhD imaging: The post holder will be engaged in acquiring multi-modal in vivo, in situ, and (fixed) ex vivo MRI of human and rat brains to better understand and model the dependency of the MRI signal on temperature, fixation, and autolysis effects.

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 and should make themselves familiar with the papers cited in this job ad.

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

Closing Date 4. October 2017

PhD modelling: Master degree in one of the above disciplines. Extensive mathematical knowledge and particular expertise in modelling. Knowledge of at least one microstructure-sensitive quantitative MRI method (e.g. diffusion MRI, relaxometry, or magnetization transfer imaging). Additional interest in modelling advanced ex vivo histology, e.g. CLARITY.

Closing Date 4. October 2017

PhD imaging: Master degree in the above disciplines. Extensive knowledge of MRI physics, in particular quantitative MRI (in particular multi-parameter mapping and diffusion MRI). Knowledge of and interest in ex vivo MRI.

Closing Date 4. September 2017

Informal enquiries: Please email Dr. Siawoosh Mohammadi for further information about the project (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 publications. Please submit your application via the UKE website (https://www.uke.jobs, Reference codes: 2017-334, 2017-335. 2017-336) or directly to s.mohammadi@uke.de.

More information can be found here:

https://www.uke.de/kliniken-institute/institute/systemische-neurowissenschaften/forschung/arbeitsgruppen/quantitative-mri-and-in-vivo-histology.html

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