



PhD Thesis within the Project “Capturing Tumor Heterogeneity in Hepatocellular Carcinoma – A Radiomics Approach Systematically Tested in Transgenic Mice”

Institution: Computer Assisted Clinical Medicine, Heidelberg University, Germany

Start date: as soon as possible

Duration: 36 months

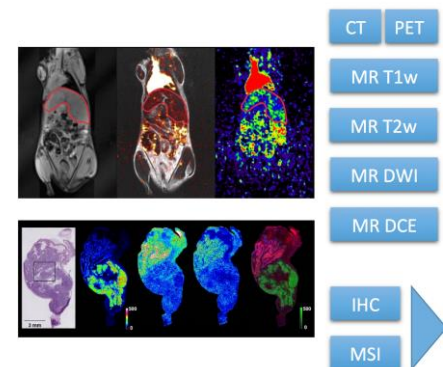
Profile:

Applicants will hold a master degree in (medical) physics, biomedical engineering or a related field; basic knowledge in programming and magnetic resonance imaging (MRI), willingness to learn programming languages such as MATLAB and C++ and new (MRI) techniques related to the project is expected; experience in pre-clinical MR imaging or sequence programming is a plus.

Project Description:

Due to the limitations of standard diagnostic procedures in both primary diagnosis of HCC and treatment response assessment, the purpose of this proposal is to develop a radiomics approach for advanced molecular diagnosis of HCC that captures the complexity of (intra-) tumoral heterogeneity and treatment response patterns induced by an established Multi Kinase Inhibitor. The ultimate goal is to identify imaging and non-imaging based biomarkers by a systematic radiomics analysis that can identify and predict treatment response.

The PhD candidate will work on the optimization and implementation of a multi-parametric imaging protocol. This includes the simulation of the sequences and testing of the protocol at the scanner. Furthermore, he/she will extend the available software for quantification of functional imaging parameter of perfusion and diffusion comprising compatibility with the Bruker data format, implementation and testing of a dedicated dual inlet compartment model for liver perfusion and integrating T1 mapping in the data analysis workflow. He/she will also be responsible for implementing a registration approach to match MR/CT/PET image data to MSI data acquired within the project. A close collaboration with the project partners is expected.



Working Environment:

Our group is composed of more than thirty scientists from physics, electrical engineering, medicine and computer science and is working in close co-operation with the local medical departments. We are developing new imaging techniques and translate them with our clinical partners into daily practice. In particular, we are doing basic research on the development of novel MR-techniques for measuring perfusion, diffusion, BOLD, oxygenation, and sodium and its implementation at whole body MRI systems (Siemens) at different field strengths (4x 1.5 Tesla; 2x 3.0 Tesla) and small animal system 1T & 9.4 T (Bruker). Beside this we are developing molecular innovative imaging technologies by fusion of several imaging modalities (CT, MRI, PET) to enable image-guided, high-precision interventions using high-end CT and robotic systems (ZEEGO, Siemens). Ongoing collaborations with other researchers involve the Central Institute of Mental Health (ZI, Mannheim), the German Cancer Research Centre (DKFZ, Heidelberg), and across Europe with multiple opportunities to visit leading international laboratories and to attend taught schools.

Interested?

If you enjoy working in an interdisciplinary, young, creative and open team, we are looking forward to your application! For more information on the project or for application please contact:

Project leader:

Prof. Dr. Frank Zöllner
Computer Assisted Clinical Medicine,
Medical Faculty Mannheim, Heidelberg University,
Theodor-Kutzer-Ufer 1-3, 68167 Mannheim, Germany
Tel.: +49 621 383 5117
E-Mail: frank.zoellner@MedMa.Uni-Heidelberg.de
Web: <http://www.ma.uni-heidelberg.de/inst/cbtm/ckm/>

Prof. Dr. Ulrike Attenberger
Department of Radiology and Nuclear Medicine,
Medical Faculty Mannheim, Heidelberg University,
Theodor-Kutzer-Ufer 1-3, 68167 Mannheim, Germany
Tel.: +49 621 383 5121
E-Mail: ulrike.attenberger@MedMa.Uni-Heidelberg.de
Web: <http://www.ma.uni-heidelberg.de/inst/ikrn/>

Director:

Prof. Dr. rer. nat. Lothar Schad
Chair in Computer Assisted Clinical Medicine,
Medical Faculty Mannheim, Heidelberg University,
Theodor-Kutzer-Ufer 1-3, 68167 Mannheim, Germany
Tel.: +49 621 383 5121
E-Mail: Lothar.Schad@MedMa.Uni-Heidelberg.de
Web: <http://www.ma.uni-heidelberg.de/inst/cbtm/ckm/>