Developing a clinical workflow for improved tissue characterization based on MPI in oncology

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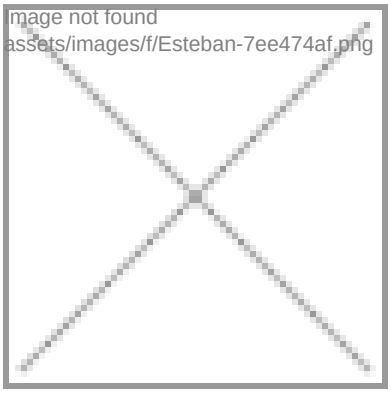
The Technical University of Munich is one of Europe's top universities. It is committed to excellence in research and teaching, interdisciplinary education and the active promotion of promising young scientists. The university also forges strong links with companies and scientific institutions across the world. TUM's Medical School is a center of excellence with 33 individual departments and 4,500 employees from more than 60 different nationalities. The hospital's researchers and scientists are closely networked with their international colleagues and generate 200 doctoral degrees and 40 post-doctoral degrees per year. The department of nuclear medicine is a world renowned institution selecting and integrating a wide range of information from multimodal and multiparametric imaging procedures in order to create workflows which are both time and cost efficient in the diagnosis and quantitative evaluation of treatment in cardiology, neurology and oncology. The department uses the spectrum from conventional SPECT to PET/CT and PET/MRI with well validated as well as innovative tracers, from morphological imaging to multiparametric MRI including C-13 hyperpolariziation in hybrid devices. Both in the preclinical and the clinical imaging domain, optimal workflows are evaluated, validated and implemented for routine use. This requires the interdisciplinary understanding of the underlying physiology, physics, and information technology which is achieved by close interactions with partners within TUM as well as national and international cooperations.



DESCRIPTION OF THE PROJECT (ESR11 - Esteban Lucas Solari)

Based on existing prostate cancer studies with 68Ga-PSMA over the last 5 years the ESR will develop, validate and implement a data analysis tool for multi-parametric, multi-modality co-registration, voxel-wise correlation, segmentation and serial analysis. The test bed for validation will be serial examinations of patients with prostate cancer prior and after therapeutic interventions. An important element will be the creation of tumour probability and therapy response maps that can be integrated into clinically meaningful image-based reports. In order to improve the efficacy of the software development, the ESR is exposed to the image generation methods, the demands of clinical environment and the processes of commercial development. Thus, we aim to create a "best of worlds" approach: academic creativity, clinical understanding and the robustness of industrial development. Within the course of this project, secondments to a clinical and industrial research organization at the universities of Copenhagen (Denmark), Groningen (Netherlands) and Siemens (Erlangen, Germany) are planned.