

BRACCO FELLOWSHIPS EDUCATION IN RESEARCH ENROLMENT FORM

Name of Institution_ Medical University of Vienna, Department of Biomedical Imaging and Image-guided Therapy, Division of Gender and Molecular Imaging, Vienna/AUSTRIA

City and Country of Institution: VIENNA AUSTRIA

RESEARCH GROUP

Brief description of the research group and of its mission:

The main fields of research interest are clinical and experimental investigations on a cellular and sub-cellular level to diagnose cancer non-invasively and to monitor responsiveness to treatment. We focus on a more accurate cancer characterization through the synthesis of anatomical, functional, and molecular imaging information derived by different biomedical imaging methods. The working group of Prof. Helbich developed and optimized several imaging methods on the basis of MRI / PET, different molecular imaging tools, as well as minimal invasive diagnostic techniques particular in breast and prostate cancer.

TITLE OF PROPOSED RESEARCH PROJECT

Multiparametric 18F-FDG PET/MRI coupled with Radiomics Analysis and Machine Learning for Prediction and Assessment of Response to Neoadjuvant Therapy in Patients with Breast Cancer

HYPOTHESIS:

- a) We hypothesize that machine learning (ML) of 18F-FDG PET /MRI can predict NAC.
- b) Implementation in a multiparametric imaging concept: We hypothesize that machine learning of 18F-FDG PET can be implemented in a multiparametric PET/MRI imaging concept and improves NAC prediction.

OBJECTIVES:

- To evaluate whether ML with 18F-FDG PET can predict NAC and compare it to SUV metrics, metabolic tumor volume and total lesion glycolysis

- To compare the diagnostic accuracy for NAC prediction of multiparametric 18F-FDG PET/MRI using DCE, DWI and ML to single parametric DCE-MRI and mpMRI with DCE MRI and DWI

APPLICANT'S DUTIES:

- Attend regular research meetings and journal clubs. Get familiar with the current literature
- Data processing, data storage and analyses of several already acquired multiparametric PET/MRI studies. Run statistic tests under
- Presentation of results, manuscript preparation and submission to a research journal. Supervision will provided in all steps of the project by the PI and co-authors

APPLICANT'S BENEFITS:

- Understand the principle of multiparametric breast PET/MRI
- Use multiparametric breast PET /MRI in clinical practice
- This fellowship will educate participants in state-of-the-art breast imaging and further advance the implementation of mpPET/MRI of the breast in clinical.
- Participation on scientific outcomes of the project i.e. presentations to congresses or publications of papers

Project Leader: Prof. T. Helbich

Members: Prof. M. Hacker, Prof. P. Clauser, Prof. P. Baltzer, Dr. N. Poetsch, Prof. G. Langs