ESR 10 Information Sheet

Project title: Multimodal intraoperative handheld forward imaging probe

Host institution/company: Medical University Vienna (Austria)

Supervisors
- *Academic:* Prof. Dr. Rainer Leitgeb, PI in the Biophotonics Group, head of Christian Doppler Laboratory OPTRAMED at the Center for Medical Physics and Biomedical Engineering at the Medical University of Vienna
- *Industrial:* Dr. Christoph Hauger (Carl Zeiss Meditec AG, Oberkochen, Germany)

Type of contract: 36-months full-time research grant within the PHAST-ETN project.

Brief description of the project: The biomedical imaging group of the Center for Medial Physics and Biomedical Engineering at the Medical University of Vienna focuses on multimodal biomedical imaging and spectroscopy for clinical diagnostics and therapy. The ESR project will work on the combination of high-speed three-dimensional OCT, label-free OCT angiography (OCTA) and non-linear optical microscopy (NLOM) for enhanced detection and surgical guidance in brain tumors. The ESR addresses enhanced wide-field morphologic pre-screening (OCT) and label-free molecular-functional detection (NLOM, OCTA) with enhanced depth of focus (computational AO) of brain lesions and tumor borders. Furthermore, the design and development of innovative fibre optical probes for multimodal endoscopy allowing for the simultaneous implementation of several spectroscopic modalities will be a further objective of the ESR. Achieving these objectives will provide the basis for using multimodal imaging as intraoperative approach to detect tumour surgical margins lable-free and with high sensitivity.
Planned secondments at **INNO**, **CZM**, **GRIN**, and **ALU-FR.**

Qualifications
Essential
- Applicants should hold or expect to attain, as a minimum an MSc in Physics, Chemistry, Optics/Photonics or related area.

Knowledge and Experience
Essential
- A demonstrated knowledge of at least two of the following: optical spectroscopy / microscopy and their application in biomedicine, photonics / optics, laser physics, optical design, nonlinear optics, electronics, technical programming language (Labview, MatLab or Python), image analysis.

Desirable
- Research project carried out in at least one of the above disciplines.

Skills and Competencies
Essential
- Applicants whose first language is not English must submit evidence of competency in English,
- Evidence of interest, aptitude and research experience in the above disciplines.

Further information
For any informal queries, please contact Prof. Rainer Leitgeb by email at rainer.leitgeb@meduniwien.ac.at