



ESR 9 Information Sheet

Project title: Multimodal endo-microscopy for improved in-vivo colorectal cancer diagnosis.

Host institution/company: Albert-Ludwigs Universität Freiburg (Germany)

Supervisors

- *Academic:* Prof. Hans Zappe, Gisela and Erwin Sick Chair of Micro-optics, Department of Microsystems Engineering, University of Freiburg.
- *Industrial:* Dr. Bernhard Messerschmidt, Grintech GmbH.

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

Brief description of the project: We are looking for a talented and motivated doctoral candidate to work in the field of multi-modal endoscopic imaging systems. The project aims to address the need for improved colorectal cancer (CRC) diagnosis through an innovative photonics based multimodal imaging platform for cost-effective, label-free, non-ionizing optical imaging and endoscopically combined spectroscopic technologies (OCT/OCT angiography / Raman spectroscopy). The complementary morpho-molecular information provided by the multiple modalities will be the key for higher sensitivity and specificity in the identification of lesions, compared to the standard endoscopic inspection procedures. Each of the imaging modalities proposed for the project are, alone and in combination, highly innovative in technology and in application to CRC diagnosis. Once the imaging system is developed, the student will also take part in imaging experiments on biological tissue samples. In addition to the research activities, the prospective student is also expected to assist in the teaching activities of the laboratory and supervise MSc and HiWi students.

Planned secondments at **Grintech GmbH** (Germany), **INNOLUME GmbH** (Germany), **Leibniz Institute of Photonic Technology** (Germany), and **Medical University Vienna** (Austria).

Qualifications

Essential

An MSc degree (or equivalent) in electrical or microsystems engineering; alternatively physics, biomedical engineering or mechanical engineering with a background in optics.

Knowledge and Experience

Essential

- A basic knowledge of optic and photonics.

Desirable

- An understanding of basic light-tissue interactions; spectroscopy; knowledge of mechanical design and FEA analysis; experience with microfabrication processes.

Skills and Competencies

Essential

- Non-native English speakers are kindly asked to provide evidence of competency in English. Proficiency in German is a strong plus.
- Evidence of interest, aptitude and research experience in the above disciplines.

Further information

For any informal queries, please contact Prof. Hans Zappe at zappe@imtek.uni-freiburg.de.