

## **MR-VIPRO - MR-Visible Plastics in Radiation Oncology**

### **PhD-Student position**

#### **Background information**

The Department of Radiation Oncology and the Center for Medical Physics and Biomedical Engineering at the Medical University of Vienna received funding for the development of plastic materials which are visible in magnetic resonance (MR) imaging for applications in radiation oncology. MR imaging gained importance in radiation oncology as it provides a superior soft tissue contrast compared to computed tomography (CT) imaging. The integration of MR imaging has progressed to the point where MR-only workflows, eliminating the reliance on CT images, have become feasible. However, a critical challenge in this approach lies in the accurate transfer of positional information from imaging to treatment. Conventional fiducial markers and immobilization devices, typically composed of materials invisible on MR images, compromise the geometric accuracy.

The Medical University of Vienna holds a patent on a light-curable resin capable of producing a MR imaging signal. This patent serves as core technology for this project, aiming to explore the application of this MR-visible compound as markers or immobilization devices in MR driven radiation oncology workflows.

#### **What We Offer**

- A highly interdisciplinary and collaborative work environment
- Access to state-of-the-art facilities and technologies
- Enrolment in the Doctoral PhD program N094 at the Medical University of Vienna
- Funding that covers all research costs, work-related travel expenses, salary and health insurance for 3 years at a 30 h per week basis

#### **What We Expect**

- Master's degree (incl BSc equivalent to 300 ECTS) in Physics or Biomedical Engineering
- Interest in material development and magnetic resonance imaging
- Strong analytical skills and ability to work independently on a project basis
- Background knowledge in material development and 3D- printing is an asset
- Skills in magnetic resonance imaging, image analysis and processing are an asset
- Basic knowledge in radiation oncology and radiology recommended
- Good written and verbal communication skills
- Fluent in English (oral and written)



## Key Responsibilities

- Further development of the MRI visible polymer material compound including optimization for the envisioned applications
- Comprehensive material testing of imaging, mechanical, radiological/dosimetric, and chemical properties
- Crafting a material compound optimized for envisioned applications
- Optimization of MR acquisition parameters for these materials in the context of radiation oncology
- Design, creation and testing of initial prototypes of MR-visible markers and immobilization devices

## General project and contact information

Start of project: 01.09.2024

Place of work: Department of Radiation Oncology, Medical University of Vienna, Vienna

Closing date for application: 31.08.2024

Please submit your application including a CV and motivation letter to Wolfgang Lechner ([wolfgang.lechner@meduniwien.ac.at](mailto:wolfgang.lechner@meduniwien.ac.at)).

The employer does not discriminate on the grounds of race, color, religion, sex, sexual orientation, including transgender status and gender expression, national origin, citizenship status, age or disability. Disabled candidates are preferentially considered in case of equal qualification. Applications from women are encouraged.

For more information visit the homepage of [Department of Radiation Oncology | MedUni Vienna \(meduniwien.ac.at\)](https://www.meduniwien.ac.at/departments/radiation-oncology) and the [Center for Medical Physics and Biomedical Engineering | MedUni Vienna \(meduniwien.ac.at\)](https://www.meduniwien.ac.at/center-for-medical-physics-and-biomedical-engineering).