Doctoral Candidate 11 - Multiparametric MRI with quantification of the brain clearance and iron content in the diseased brain

Host Institution	University of Antwerp, Belgium
PhD enrolment	University of Antwerp, Belgium
Primary Supervisor	Prof. Dr. Marleen Verhoye, Bio-Imaging Lab
Subject area	Preclinical MRI, MR Physics, animal models of neurodegeneration

About this doctoral project and your tasks

First in collaboration, with UAntwerp imec-Vision Lab, you will develop and implement **super-resolution reconstruction for quantitative susceptibility mapping (QSM) mapping** to study regional iron content. Second, in collaboration with Bruker and imec-Vision Lab, you will implement **intra-scan modulated multi-shot EPI based diffusion MRI sequences** to enable fast and flexible diffusion MR to study brain microstructure. Finally, you will develop an end-to-end AI-based method to automatically **segment the rodent brain in aging and diseased state** from the multi-parametric (diffusion and QSM) MRI images. You will validate the new developed methodologies, in **animal models of neurodegeneration** (Alzheimer's disease, Huntington's disease or multiple sclerosis).

You tasks will include:

- You will work actively on the preparation and defense of a **PhD thesis** in the field of magnetic resonance imaging.
- You will write several high-quality **scientific articles** related to the research project and publish them in peer-reviewed journals.
- You will carry out a limited number of teaching and research support tasks for the Bio-Imaging Lab of the Department of Biomedical Sciences.

Foreseen secondments

For this project, we foresee secondments to:

- Dr. Sascha Koehler (4 months) at **Bruker BioSpin** (Germany)
- Dr. Ana-Maria Oros-Peusquens (3 months) at **Forschungszentrum Jülich** (Germany)

About the host institution and research group

The **University of Antwerp** is a dynamic, forward-thinking university in the second largest city in Belgium. We offer an innovative academic education to more than 20000 students, conduct pioneering scientific research and play an important service-providing role in society. With more than 6000 employees from 100 different countries, we are helping to build tomorrow's world every day.

The core R&D activity of the **Bio-Imaging Lab** is concentrated on high resolution **in vivo Magnetic Resonance Imaging (MRI) of small laboratory animals** to study the central nervous system structure and function in health and pathology using **different MRI modalities** (anatomical MRI, diffusion MRI, functional MRI, resting state fMRI, perfusion MRI, Manganese Enhanced MRI, MR relaxometry, …). This research is performed on **rat and mouse models for different neuropathologies**. Using these MRI techniques the focus of the research lies on early detection and understanding of the mechanisms underlying neurodegeneration, neuro-developmental and mood disorders including Multiple sclerosis, Huntington's disease, Alzheimer's disease and Spinal Cord Injury.

About the offer

- The selected candidate will be employed by University of Antwerp for **36 months** on the MSCA-DN project. In line with university regulations and following a positive evaluation by the doctoral committee, University of Antwerp may provide additional funding for a maximum of 12 months to complete the doctoral degree.
- Doctoral candidates are offered a **competitive remuneration** based on the MSCA allowances and the regulations of the host institution. The gross monthly amount at University of Antwerp corresponds to the [amount for doctoral scholarship holders](#). Moreover, funding is available for technical and personal skills training and participation in international research events.
- **Expected start date**: between April and September 2025. We encourage last-year master students who will graduate by this time to already apply.

More information is available in the [general information document](#) for IQ-BRAIN positions.

Specific profile and requirements

- Your profile aligns with the **[general requirements and eligibility criteria](#)** of the IQ-BRAIN project.
- You have a **master's degree in physics, computer science, mathematics, Bio(medical) engineering, or related field** (or will have by the time of your appointment).
- Background in **scientific computing**, and experience with **science-related coding platforms** will be highly valued.
- Hands-on training/experience with *in vivo* **experimental neuroscience, neuroimaging** is appreciated.
- You are able to **balance bench and data analysis work** independently, creatively, and efficiently.
- You are willing to handle and work with laboratory rodents. You have a **FELASA B/C certificate** for animal research or are willing to obtain one.

More information

For additional information about the research project, contact:

Prof. dr. Marleen Verhoye
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or

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