

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

<b>Host Institution</b>	University of Antwerp, Belgium
<b>PhD enrolment</b>	University of Antwerp, Belgium
<b>Primary Supervisor</b>	Prof. Dr. Marleen Verhoye, Bio-Imaging Lab
<b>Subject area</b>	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.

### How to apply

All applications must be submitted via the **IQ-BRAIN job platform**:  
<https://www.uantwerpen.be/en/projects/iq-brain/jobopenings/apply/>.

**Deadline for applications: 1 December, 23:59.** More information about the application procedure is available in the [general information document](#) for IQ-BRAIN positions.

### More information

For additional information about the research project, contact:

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or

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