Doctoral Candidate 4 - Acquisition and joint reconstruction of dynamically weighted and undersampled MR-datasets

Host Institution	Bruker BioSpin, Germany
PhD enrolment	University of Antwerp, Belgium
Primary Supervisor	Dr. Sascha Koehler, Bruker BioSpin Preclinical Imaging Method development
Subject area	Preclinical MRI, MR sequence development, Data acquisition, Image reconstruction, Machine learning

About this doctoral project and your tasks

You will develop an **MR-sequence offering full flexibility** regarding orientation, timing, (diffusion-) weighting strategies, and sampling trajectories. Thus, you will acquire a thorough understanding of MRI and its numerous contrast mechanisms.

Since MRI is inherently slow, efficient acquisition techniques like compressed sensing and parallel imaging became increasingly popular in the recent years. Requiring dedicated reconstruction techniques, implementing these methods will allow you to familiarize with **mathematical algorithms** like iterative linear solvers and machine-learning based reconstruction.

The **modular design of the reconstruction framework** will allow for an easy transition between image reconstruction and the generation of quantitative maps. In collaboration with the scientific partners of the consortium, you will learn about DL models enabling direct mapping of undersampled data to quantitative information of the brain.

Foreseen secondments

For this project, we foresee secondments to:

- Prof. Aleksandra Pizurica (4 months) at **University of Ghent** (Belgium)
- Prof. Marleen Verhoye (3 months) at **University of Antwerp** (Belgium)