

OxTBI Group – Project

Please complete the form below and return to: OxTBI@ndcn.ox.ac.uk

Project Title:

Physics-based, multimodal white matter damage assessment associated with aging

Supervisor(s) / PIs Name, email

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Department

Department of Engineering Science
Podium Institute of Sports Medicine and Technology

Prospective project level (Short project / Master's / DPhil / Postdoc)

Short project, Master's, DPhil

Funding status (Funded / Non-funded)

If funded, please indicate how much is covered, and the duration of funding.

Non-funded

Project Summary / Outline

Brain aging is associated with progressive cognitive and functional decline. Unfortunately, however, despite a myriad of research, the interplay between underlying neurodegenerative mechanisms is still poorly understood. The Swedish BioFinder-2 study provides a comprehensive multimodal imaging dataset that provides a unique opportunity to investigate cross-sectional and longitudinal changes linked to tissue damage mechanisms. In this project we will focus on white matter and build on our multiphysics modelling expertise, to combine structural and functional imaging and infer the biomechanical mechanisms associated with white matter lesions. We will integrate T1-weighted anatomical images, DTI, FLAIR, SWI, and PET to characterize the extent of white matter damage and use our models to predict long-term aging. This project includes medical image analysis and modelling and will allow to infer prevalent tissue damage mechanisms.

Required skills / experience

Medical image analysis, data processing, neurobiology of aging, coding

Any other information

Please don't hesitate to inquire about more information or to discuss alternative project ideas.