

**Project title:** Improved MRI techniques for diagnosis of brain vascular dysfunction

**Supervisors:** Joanna Wardlaw, Ian Marshall, Michael Thrippleton  
**Centre for Clinical Brain Sciences (CCBS)**

This project to study vascular dysfunction in the brain is an MRC PhD Studentship in the University of Edinburgh UK Dementia Research Institute Centre. The PhD will be for 3.5 years starting in September 2017.

Alzheimer's and vascular dementia affect over 45 million people worldwide and cost over £26 billion per year in the UK alone. Currently, there are no disease modifying treatments, and the number of people with the disease is rapidly increasing as our population ages. A clearer understanding of the pathophysiology is needed to guide the development of effective therapeutics.

Vascular dysfunction in dementia includes impaired blood-brain barrier (BBB), vasoreactivity (CVR) and interstitial fluid (ISF) drainage. The contribution of each and the sequence of pathology is unknown. The project will test the hypothesis that BBB leakage predates impaired CVR and leads to ISF stagnation. Multiparametric MRI methods will be developed (in collaboration with healthcare technologist Siemens) to identify and map BBB function, CVR, and ISF drainage onto detailed structural brain images to map tissue damage and lesion development. The student will train in novel MRI acquisition techniques, the handling of large data sets, and computational image analysis.

In addition to working on an important problem with cutting edge techniques, the student will be part of the newly formed UK Dementia Research Institute Centre at the University of Edinburgh. This is part of a 250 million pound investment in dementia research across 6 centres in the UK and the student will be part of a vibrant local and national research community. CCBS also has extensive international collaborations through EU Horizon 2020 and Leducq Foundation funding.

Interested students should in the first instance contact the supervisor(s) to discuss the project (Joanna.Wardlaw@ed.ac.uk or Ian.Marshall@ed.ac.uk). Shortlisted candidates will be called for interview around mid-July.

Application details

- Normally the scholarships cover UK/EU tuition fees only.
- Applicants should download and complete the application form from our EdNeuro.PhD portal ([www.edinburghneuroscience.ed.ac.uk/applying](http://www.edinburghneuroscience.ed.ac.uk/applying)).
- Completed application forms should be emailed to [EdNeuro.PhD@ed.ac.uk](mailto:EdNeuro.PhD@ed.ac.uk)

• **Application deadline**

**5pm, Friday 23<sup>rd</sup> June 2017**

We expect to hold interviews mid-July, and PhD programmes will start in September 2017.