**YEAR: 2014/15**

**SUPERVISOR: DR ROXANA CARARE**

**STUDENT: MR RICHARD CUMPSTY**

**INSTITUTION: SOUTHAMPTON UNIVERSITY
PROJECT TITLE: DEFINING THE CEREBRAL PERIVASCUlAR SPACES, SIGNIFICANT FOR THE LYMPHATIC DRAINAGE OF THE BRAIN**

**Brief Resume of your Project’s outcomes for the Society’s Website**: **(no more than 200-250 words)**.

*The title of your project and a brief 200-250 word description of the proposed/completed project. The description should include sufficient detail to be of general interest to a broad readership including scientists and non-specialists. Please also try to include 1-2 graphical images (minimum 75dpi). NB: Authors should NOT include sensitive material or data that they do not want disclosed at this time.*

The brain does not have conventional lymphatic vessels. Interstitial fluid is eliminated from the brain along basement membranes of capillaries and arteries, a pathway restricted to fluid and solutes, but restrictive for the drainage of cells. The perivascular lymphatic drainage pathway along basement membranes changes with ageing and with possession of Apolipoprotein E4 genotype, resulting in the accumulation of Amyloid in the walls of cortical arteries, dilatation of perivascular spaces in the white matter and in Alzheimer’s disease. Using electron microscopy, this project characterised the perivascular drainage pathways in the white matter and compare them to those in the cortical gray matter. This anatomical science knowledge is crucial for the understanding of the pathology of dilated perivascular spaces in Alzheimer’s disease and for the design of targeted therapies for the efficient removal of Amyloid from the Alzheimer brain. I have become competent in the methodology (transmission and scanning electron microscopy) and have identified arteries in white and grey matter. There appear to be two leptomeningeal sheets with a wide perivascular space in the white matter, compared to the grey matter. This is significant in the context of vascular amyloid deposits that are commonly associated with dilated perivascular spaces.

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