Multiple sclerosis (MS) is a demyelinating disease which damages the brain and spinal cord through inflammation. It is one of the most common causes of disability in young adults and there is currently no cure. We use the retina, the back of the eye, to monitor and research this condition. Blood flow to the brain is known to be affected in MS but we are not sure why. Improving blood flow to the brain could be an effective way to reduce the rate of disease progression in people with this condition.

The smallest blood vessels of the brain are difficult to image. We can instead use the retina which is much more accessible and has the same vascular properties as the brain. Imaging the smallest blood cells of the retina is often hindered by the optics of our eyes. Adaptive Optics (AO) is a technique from astronomy which allows us to look at the smallest cells in real time.

Is retinal blood flow affected in MS?

Retinal blood flow is affected in MS. We are using the above techniques in a clinical trial of MS patients using simvastatin, a drug with the potential to improve quality and speed of blood flow.

What does this mean for the future of MS?

Our study highlights the potential importance of blood flow in MS, and supports the idea that microvascular function is significant in the development of disease. It also shows how useful the retina can be in researching brain disease. We could use adaptive optics in the future to study other brain diseases with a vascular component e.g. stroke, dementia which have huge social and economic consequences.