Curriculum Vitae

Name: John Greenwood

Current appointment: Davson Professor of Biomedical Research and Head of Department of Cell Biology

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Qualifications:

1977. BSc (Hons), Physiology and Biochemistry, University of Reading.
1983. PhD, Department of Neuropathology, Institute of Psychiatry, Faculty of Medicine, University of London.
1993. MRCPath.
2001. FRCPath

Honors, review boards and offices held

1989-1992. Literature Review Editor: Current Opinion in Neurology and Neurosurgery; 1990 to 1991. Academic Staff Liason member for the BPMF Scientific Database Committee; June 1990-1993. Awarded the Renee Hock Fellowship, Institute of Ophthalmology, University of London; 1991-1993. Literature Review Editor: Cerbrovascular and Brain Metabolism Reviews; June 1993. Selected to exhibit research work at the Royal Society Summer Exhibition, "New Frontiers in Science" (Royal Society, UK); 1995. Editor: "New concepts of a blood-brain barrier", Plenum Press; 1985 to 1996. Secretary and Founder of the UK Blood-Brain Barrier Club; 1987-1997. Founder and Convener of the Blood-Brain Barrier Special Interest Group of the Physiological Society, UK; 1996 to 2005. Member of the Institute Academic and Research Committee. Institute of Ophthalmology; 1999 to 2005. Member of the Strategy and Resources Management Group. Institute of Ophthalmology; 2003 to 2008. Head of Division of Cellular Therapy, Institute of Ophthalmology; 2004 to 2008. Founder and Committee member of the International Society for Ocular Cell Biology; 2008-present. Head of the Research Department of Cell Biology, Institute of Ophthalmology.

The Greenwood laboratory

The major focus of the laboratory is to understand the role the blood-tissue barrier sites of the central nervous system (the blood-retinal barrier and the blood-brain barrier) play in diseases of the eye and brain. In the eye we are interested in the role of retinal microvascular endothelial cells and retinal pigment epithelial (RPE) and how they contribute to the development of retinal diseases such as intraocular inflammation, diabetic retinopathy, idiopathic parafoveal telangiectasia (IPT) and age-related macular degeneration (AMD). In the brain our focus is on the role of the microvascular endothelial cell in orchestrating immune cell recruitment to the cerebral parenchyma in inflammatory conditions such as multiple sclerosis. My research staff occupy state-of-the-art laboratories in the Henry Wellcome Building for Translational Eye Research at the UCL Institute of Ophthalmology. This new building was the result a successful £9.2M application led by myself and funded by the Wellcome Trust and Fight for Sight. Grant income (as of March 2008) as Principle Investigator is currently in excess of £2.5 million and as co-applicant is £0.5 million.

Role of the vasculature in brain and retinal disease

Research into the role the vascular endothelium plays in the pathogenesis of brain and retinal inflammation is a core component of the laboratory; a substantial part of which is supported by Programme grant funding. Such work has been at the forefront of identifying and characterising novel endothelial cell mechanisms that facilitate the recruitment of leucocytes to the CNS, a critical step in the pathogenesis of diseases such as multiple sclerosis, posterior uveitis and possibly diabetic retinopathy. With this information we have been able to design novel therapeutic approaches to target these critical pathways in order to reduce leukocyte recruitment and attenuation the disease process (Greenwood et al., 2003; Gegg et al., 2005). Work from our laboratory has had a major influence on the decision to trial statin therapy for the treatment of inflammatory diseases of the brain and eye (Greenwood et al., 2006; Greenwood and Mason, 2007). Our understanding of these cellular mechanisms remains superficial and ongoing research continues to identify other biochemical pathways that can equally be targeted through pharmacological intervention.

More recently our vascular cell biology research has also developed to address the biology underpinning other retinal diseases such as diabetic retinopathy and idiopathic parafoveal telangiectasia (IPT or macular telangiectasia). We are endeavouring to understand the signalling pathways that lead to endothelial cell-cell junction permeability changes (Turowski et al., 2008). By understanding how junctions are regulated at the molecular level it is hoped that therapeutic strategies can be developed on the one hand to reduce vasogenic edema and on the other to enhance drug delivery. As part of a major international consortium (the MacTel Project; http://www.mactelresearch.org) we are also gaining a deeper understanding of the factors that control vascular remodelling in the retina. Not only will this shed light on the molecular mechanisms underlying vascular telangiectasia but may also offer insight into vascular problems associated with other diseases such as diabetic retinopathy.

Role of the RPE in retinal disease

Understanding the role of retinal pigment epithelial (RPE) cells in the development of retinal diseases such as age-related macular degeneration (AMD) and IPT constitutes the other major focus of the Greenwood laboratory. Developing immortalised RPE cell-based therapies for the treatment of AMD has been a major theme of research and ongoing studies aim to develop this work further prior to taking it into the clinic (Lund et al., 2001). This research has been highly successful and has benefited from a closely integrated interdisciplinary team in which various scientific and clinical disciplines are represented. More recently we have been investigating the ability of RPE cells to transdifferentiate towards a neuronal phenotype, to investigate the role of RPE in innate immunity and in the development of AMD (Coffey et al., 2007), and to understand at the molecular level the mechanism of phagocytosis.

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