Stephen Crocker, Ph.D.

Associate Professor of Neuroscience and Associate Director of Neuroscience Graduate Program at University of Connecticut

Farmington, CT, US

Prof. Stephen Crocker is an expert on how the immune and nervous systems interact and how this balance is disrupted.

Biography

Prof. Stephen Crocker is an Associate Professor of Neuroscience and the Associate Director of the Neuroscience Graduate Program. His lab is interested in how the immune and nervous systems interact and how this balance is disrupted in diseases of the nervous system. The ultimate aim of his research program is to understand how the brain is injured during chronic inflammatory diseases of the nervous system, what regulates the ability of the brain to repair itself and how this knowledge might be used to promote brain regeneration and recovery. His current projects examine the role of the immune system in myelin pathology as it relates to diseases like Multiple Sclerosis (MS). In MS, the immune system mounts an inappropriate response against the coating of the nerve cells, called myelin. Myelin is critical for proper brain development and function. Hence, progressive myelin injury in MS can result in debilitation that can lead to permanent disability. The cause of MS is not known. The purpose of this research is to understand how the nervous system responds to myelin injury and repairs myelin damage. Toward this goal, we have found that during an inflammatory attack that causes myelin damage the nervous system produces a protein called Tissue Inhibitor of Metalloproteinases-1 (TIMP-1). A function of TIMP-1 is to block key enzymes, called metalloproteinases, immune cells use to move into the brain tissues and can breakdown myelin. Our studies indicate that during inflammatory models of myelin injury TIMP-1 may be important in the regulation of immune cells called macrophages and microglia. As well, we determined that following myelin injury mice that lack TIMP-1 are also less able to repair their myelin. Accordingly, we propose to study two primary functions we believe to be important roles for TIMP-1: the control of macrophages and microglia following myelin injury, and the stimulation of myelin repair through promoting endogenous cells to rebuild the injured myelin.

Areas of Expertise

Nervous System, Immune System, Neuroscience

Affiliations

American Association of Neuropathologists, American Society of Neurochemistry, Society for Neuroscience

Education

University of Ottawa
Ph.D.

University of King's College
B.Sc.

Accomplishments

National Multiple Sclerosis Society Career Transition Award
National Multiple Sclerosis Society Career Transition Award (2007-2011) - National Multiple Sclerosis Society

Dale McFarlin Travel Award
Dale McFarlin Travel Award - National Multiple Sclerosis Society

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