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2015 Audrey Steinman Gilden Lectureship Tom Lane

Authored by Donald Gilden



Dr. Tom Lane completed his Ph.D. in the Department of Microbiology and Immunology at the UCLA School of Medicine, followed by a postdoctoral fellowship in the laboratory of Dr. Michael Buchmeier at the Scripps Research Institute in La Jolla, CA (1993-1997). Dr. Lane joined the Department of Molecular Biology & Biochemistry at University of California, Irvine, in 1998 as an Assistant Professor and was appointed Professor in 2004. At UC Irvine, he was Director of the Biotechnology Program (2004-2007), Associate Director of the Institute of Immunology (2009-2011), and received the distinction of Chancellor’s Fellow in 2008. Dr. Lane was also the founding Director of the Multiple Sclerosis (MS) Research Center (2011-2013). In 2013, Dr. Lane became Professor in the Department of Pathology at the University of Utah School of Medicine. Dr. Lane’s research focuses on employing viral models of demyelination to interrogate molecular and cellular mechanisms governing neuroinflammation and demyelination, as well as the therapeutic potential of neural progenitor cells (NPCs) in promoting remyelination.

At UCLA, Dr. Lane developed an interest in how cytokine signaling tailors immune responses after microbial infection. At Scripps, he extended this work and focused on chemokines and their role in regulating neuroinflammation in response to central nervous system (CNS) infection with neuro-adapted strains of mouse hepatitis virus (MHV). MHV infection of the CNS produces an acute viral-induced encephalomyelitis followed by chronic immune-mediated demyelinating disease that shares clinical and histologic features with MS. Dr. Lane is identifying the functional roles of chemokines and chemokine receptors in linking innate and adaptive immune responses as well as attracting activated lymphocytes and macrophages into the CNS that either participate in host defense and/or contribute to demyelination. Collaboration with Medarex, Inc., has led to the development of a human monoclonal antibody specific for the chemokine CXCL10 that is currently being tested in human inflammatory disease.

For the past 10 years, his laboratory has also been studying the therapeutic potential of NPCs in mediating both clinical recovery and neuroinflammation in MHV-infected mice with established immune-mediated demyelination. Given the likelihood that viral infection initiates demyelination in humans and the fact that numerous neurotropic viruses

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persist in the brain, it is imperative to evaluate the therapeutic potential of NPCs in the presence of a persistent viral infection that correlates with chronic neuroinflammation and demyelination. Dr. Lane's laboratory was the first to demonstrate that surgical engraftment of mouse NPCs into the spinal cords of virally-infected mice resulted in remyelination and extensive axonal sparing, with most transplanted cells differentiating into oligodendroglia. Subsequent studies revealed that: (1) the transcription factor Olig1 was required for specification and/or maintenance of oligodendroglial identity by transplanted NPCs, (2) engrafted NPCs utilize CXCR4 to selectively congregate in areas of demyelination by responding to the chemokine ligand CXCL12, and (3) NPC-derived oligodendroglia are protected from cytokine-mediated apoptosis via CXCR2 signaling pathways.

Dr. Lane will present current collaborative work with Dr. Michael Cahalan (UC Irvine) and Dr. Jeanne Loring (Scripps Research Institute) that employs 2-photon microscopy to visualize axonal damage after MHV infection of the CNS, demonstrating that NPCs physically engage demyelinated axons and initiate remyelination, and shows the beneficial effects of spinal cord engraftment of human NPCs into MHV-infected mice.

Audrey Steinman Gilden Lectureship



The Audrey Steinman Gilden Lectureship recognizes investigators whose cutting-edge research achievements have made important contributions to understanding the molecular pathogenesis of neurotropic virus infection. The lectureship was established by Dr. Don Gilden, who has contributed significantly to the disciplines of neuroscience and neurovirology through his groundbreaking work on lymphocytic choriomeningitis virus, varicella zoster virus, and multiple sclerosis. A 2007 recipient of the ISNV Pioneer in NeuroVirology award, Dr. Gilden established this lectureship in honor of his wife, Audrey.



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