The Schmitt Foundation

The Kilian J. and Caroline F. Schmitt Foundation, in cooperation with the University of Rochester, supports a new research program for investigators interested in the nervous system and its disorders. The Program, now in its third year, is specifically targeted toward interdisciplinary research that crosses traditional boundaries. The Schmitt Program on Integrative Brain Research (SPIBR) supports new research projects, postdoctoral fellows, visiting scientists, and colloquium professors that fall within three areas of focus:

1. Learning, Plasticity, and Memory
2. The Senses and Behavior
3. The Neurobiology of Aging and Disease

Each of these topics is well represented across the neuroscience community. However, departmental, institutional, and disciplinary boundaries often prevent investigators studying the same topic at different levels of inquiry from developing collaborative or integrative research programs. The Schmitt Program is intended to catalyze and promote new directions of neuroscience research within the three target areas, and to encourage interdisciplinary and collaborative research, spanning cognitive through systems to cellular and molecular approaches.

The SPIBR is directed by an *Executive Committee* comprised of Drs. Gary Paige (Chair), Howard Federoff, and Elissa Newport in collaboration with the Board of the Schmitt Foundation. A *Review Committee*, comprised of Drs. Ernest Nordeen (Chair), William O'Neill, and Harris Gelbard, representing the three areas of focus, govern the selection process for the support mechanisms described above. The Program is administered through the Department of Neurobiology and Anatomy.

Symposium Schedule

All Lectures in the Adolph Auditorium – 1-7619

8:00 – 8:50 a.m.	Continental Breakfast (LeChase Assembly)
8:50 – 9:00	Welcome address
9:00 – 9:45	Berislav Zlokovic, M.D., Ph.D.
10:00 – 10:45	Etty Benveniste, Ph.D.
11:00 – 11:20	Break
11:30 – 12:15	William Hickey, M.D.
12:30 – 1:20 p.m.	Lunch (LeChase Assembly)
1:30 – 2:15	Richard Ransohoff, M.D.
2:30 – 3:15	Benjamin Segal, M.D.
3:30 – 3:50	Break
4:00 – 4:45	Joan Goverman, Ph.D.
5:00 – 5:30	Discussion
5:30 – 6:00	Closing Remarks
6:00 PM	Reception and Dinner at the Meliora Club

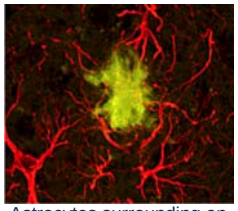
Schmitt Program on Integrative Brain Research

Symposium

Immune and Inflammatory Responses in the Central Nervous System

April 23, 2004

The contribution of inflammation-related processes to neurological diseases has been increasingly recognized in recent years. Studies of primary neuroimmunological diseases such as Multiple Sclerosis as well as neurodegenerative disorders with an inflammatory component, including Alzheimer's Disease and Parkinson's Disease, have received particular attention in basic research and clinical arenas. Inflammatory aspects of CNS trauma, toxin exposure and psychological disorders are also currently under investigation. Furthermore, the immunological/inflammatory consequence of gene therapy in the CNS is a timely and important issue. This symposium will address the roles of innate and adaptive immunity in response to CNS insults and various disease processes. Specific topics include the immune functions of glial cells, factors controlling blood brain barrier integrity, leukocyte trafficking to the CNS, CNS cytokine/chemokine production, animal models of neuroinflammatory/neuroimmunological diseases and clinical application of basic research findings.



Astrocytes surrounding an Aβ plaque.

Visiting Faculty

Etty Benveniste, Ph.D. University of Alabama-Birmingham

Dr. Benveniste's research is directed toward understanding how the immune system and central nervous system (CNS) communicate with each other via cytokine/chemokine networks. Specifically, her laboratory examines the mechanisms by which cytokines modulate class II major histocompatibility complex (MHC) class II transactivator (CIITA), intercellular adhesion molecule-1 (ICAM-1), and CD40 expression in CNS-resident cells, and the transcription factors involved in their respective gene expression. Other investigations include the ability of glial cells to secrete immunoregulatory molecules (tumor necrosis factor, interleukin-6, interleukin-10, chemokines), the intracellular signaling events involved in the response and the effects of HIV gene products on glial function.

William Hickey, M.D. Dartmouth University

Dr. Hickey is currently the Chairman of Pathology at Dartmouth Medical School. His laboratory effort focuses on the mechanisms for the initiation of inflammation in the central nervous system and regulation of blood brain barrier (BBB) integrity. Specifically, this work includes animal research with experimental autoimmune models, the kinetics and principles of lymphocyte and myeloid cell trafficking to the CNS and molecular changes in the CNS during inflammatory responses.

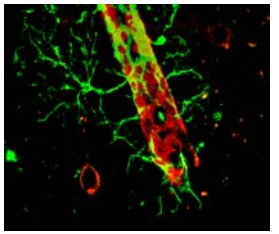
Joan Goverman, Ph.D. University of Washington

Dr. Goverman's research centers on investigating mechanisms of tolerance and autoimmunity and employs an animal model for autoimmunity, experimental allergic encephalomyelitis (EAE). EAE is triggered by generating T cell-mediated immunity to myelin antigens. Dr. Goverman's work has shown that portions of some myelin proteins induce T cell tolerance, while T cells specific for other regions of these proteins escape tolerance and mediate disease. T cell receptor transgenic models have been developed to investigate how tolerance to myelin antigens is established, maintained and broken. These transgenic models have allowed investigation into triggers of spontaneous central nervous system autoimmune disease and as well as active and passive mechanisms that function to prevent disease. Recently, her laboratory has demonstrated that, in addition to CD4+ T cells, myelin-specific cytotoxic CD8+ T cells can mediate EAE. This work extends the potential of animal models to define the full range of effector cells that may contribute to multiple sclerosis.

Richard Ransohoff, M.D. Cleveland Clinic

The core hypothesis of Dr. Ransohoff's research is that chemokines and their receptors are significantly involved in leukocyte invasion, differentiation, activation, tissue destruction and repair in the CNS. Furthermore, resident neural cells respond to locally produced chemokines. To address this hypothesis and identify molecular targets for therapy, his laboratory examines chemokine production and function. These studies comprise tissue culture systems, disease models and material from patients with neurological disease. They make extensive use of transgenic and knockout mice to clarify how chemokines exert remarkably specific effects in vivo, in the face of apparent functional redundancy in vitro.

URMC Faculty



Upregulation of COX-2 (red) and GFAP (green) following CNS Radiation Injury

Berislav Zlokovic, M.D., Ph.D.

Dr. Zlokovic's research links intravascular Alzheimer's amyloid-β (Aβ) to Aβ deposition in brain, transport across the blood-brain barrier (BBB) and neuroinflammation as a primary mechanism in Alzheimer's disease pathogenesis. Faulty clearance due to dysregulated transport of Aβ is shown to potentiate neuroinflammation and cerebral β-amyloidosis associated with reduced cerebral blood flow (CBF), triggering "silent strokes" in models of Alzheimer's disease. From the therapeutic prospective, his investigations show that new peripheral Aβ binding agents protect brain from Aβ/amyloid accumulation, neuroinflammation and suppression of CBF. In addition, his work on activated protein C (APC) in the CNS demonstrates that APC prevents leukocyte trafficking across the BBB and protects brain from injury and/or apoptosis.

Benjamin Segal, M.D.

Dr. Segal's research focuses on a mouse model of multiple sclerosis (MS), experimental allergic encephalomyelitis (EAE), mediated by CD4+ T cells specific for myelin peptides. His studies on cytokine networks demonstrated that production of the pro-inflammatory cytokine, IL-12, promotes development of EAE, whereas production of the immunosuppressive cytokine, IL-10, is protective. Using the EAE model, his laboratory also investigates the role of chemokines in leukocyte trafficking to the CNS, the function of adhesion molecules in lymphocyte migration across the BBB and mechanisms of tolerance to self-antigens. One of the goals of his lab is to devise new strategies for the treatment of autoimmune diseases such as MS.

Symposium Organizers:

Irah King, Neuroscience Graduate Student
M. Kerry O'Banion, M.D., Ph.D.
John Olschowka, Ph.D.
Benjamin Segal, M.D.

Please visit our website for registration and further program information:
http://www.urmc.rochester.edu/smd/nanat/schmitt_main.html

We are grateful to Mihail Chemiakin for allowing the use of his artwork