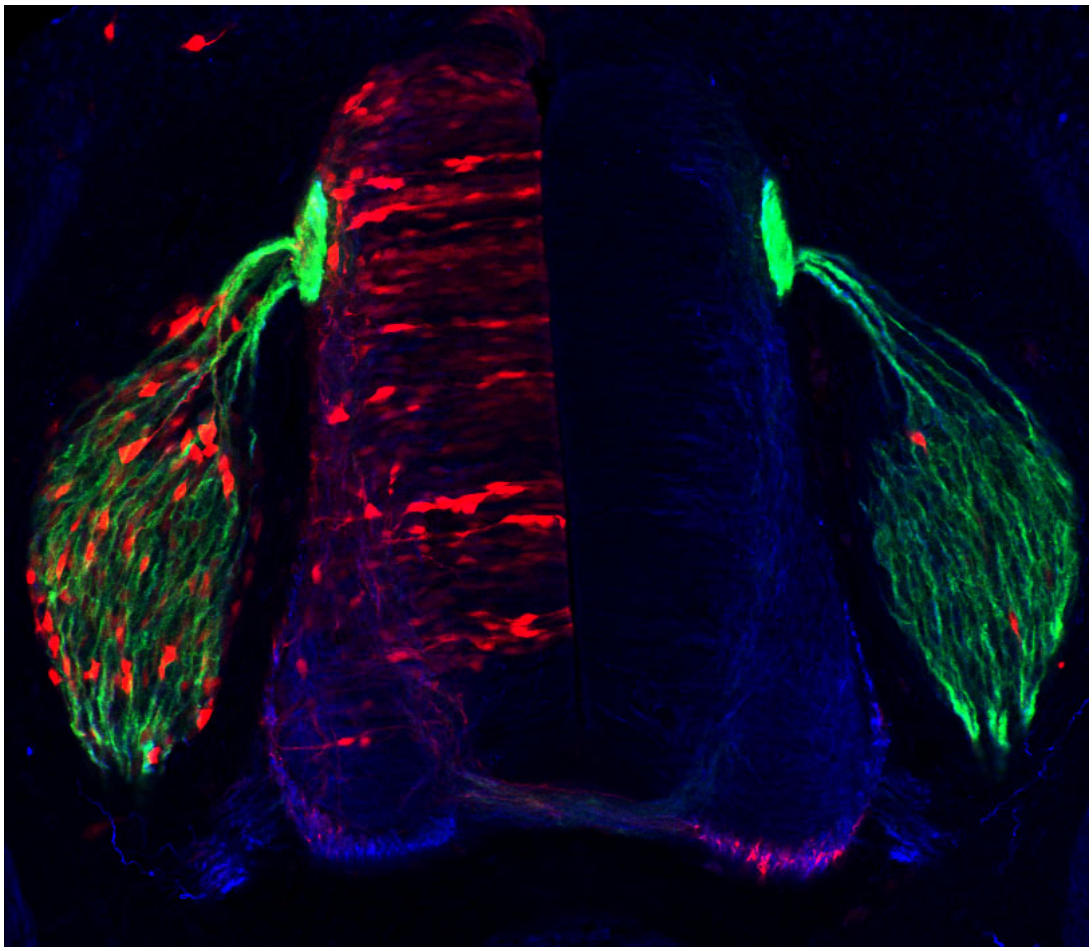
THE
NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

Neuroscience Center of Excellence



Annual Report to the

Tennessee Higher Education Commission

Fiscal year 2008-2009

TABLE OF CONTENTS

I. ADMINISTRATIVE STRUCTURE

Director: Professor William E. Armstrong, Ph.D.
Department of Anatomy and Neurobiology

Co-Director: Professor Tony Reiner, Ph.D.
Department of Anatomy and Neurobiology

Administrative Specialist: Michele May

IT Specialist/

Business Manager: Brandy Fleming

Neuroscience Executive Committee:

Matthew Ennis, Ph.D., Professor and Chair, Department of Anatmy and Neurobiology

Eldon Geisert, Ph.D., Professor and Director, Center for Vision Research, Department of Ophthalmology

Mark LeDoux, M.D., Ph.D., Professor, Department of Neurology

Charles Leffler, Ph.D., Professor, Department of Physiology

William A. Pulsinelli, M.D., Ph.D., Semmes-Murphey Professor and Chair, Department of Neurology

Tony Reiner, Ph.D., Professor and NI Co-Director, Department of Anatomy and Neurobiology

Susan E. Senogles, Ph.D., Associate Professor, Department of Molecular Sciences

Burt Sharp, M.D., Van Vleet Professor and Chair, Department of Pharmacology

Jim Wheless, M.D., Professor, Chief of Pediatric Neurology and LeBonheur Chair, Le Bonheur Hospital/UTHSC

Center Address:

University of Tennessee Health Science Center
875 Monroe Ave., Suite 422, Wittenborg Building
Memphis TN 38163
(901) 448-5956
http://www.utmem.edu/neuroscience

Organizational Structure:

The Neuroscience Center of Excellence comprises the administrative core and financial engine of the University of Tennessee Health Science Center's (UTHSC) Neuroscience Institute (NI), which is located within UTHSC's College of Medicine in Memphis, TN. Prof. William E. Armstrong is the Director, and Prof. Tony Reiner is the Co-Director. The Director answers to the Executive Dean of the College of Medicine, Steven J. Schwab, M.D. , who also serves as the Dean of the College of Medicine at UTHSC. Physically the NI is housed within twelve different departments in the College of Medicine and some other UT departments, with an administrative suite in 422 Wittenborg Building at UTHSC. Affiliated members reside at UT Knoxville, Oak Ridge National Laboratory, St. Jude Children's Hospital, Christian Brothers University, and at the University of Memphis.

II. BUDGET (see Schedule 7, page 6)

A. 2008-09. The FY 2008-09 appropriated budget for the UTNI was $643,500. We carried forward $410,363 from the previous year for a total budget of $1,053,863. This substantial carryover reflected that UTHSC College of Graduate Health Sciences picked up the majority of all graduate student stipends, some of which would have been picked up previously by NI. This carryover was used primarily to fund Pilot Research projects that commenced in Feb. of 2008 and which will be continued in 2009-2010.

This past FY, we expended $500,319 in total personnel costs, including administrative supplements (w/fringe) for the NI Director (who also directs the Imaging Center) and NI Co-Director, the Director of Confocal Microscopy, a full-time IT specialist/Business Manager, a ¾ time Administrative Specialist, full time Technical Director of Imaging Facility, 1 full graduate student stipend, matching support for 6 additional student stipends, and 1 matching postdoctoral fellowship. In addition, NI continues to partner with COM and the Department of Neurology by supporting Dr. Mike MacDonald, hired in 2007. NI will pay ~25% of Dr. MacDonald's salary/fringe over another 2 years. Finally, it is important to note that this amount also includes the personnel employed under the many pilot projects NI currently funds.

Neuroscience Imaging Center: In order to keep user fees low and assist NI scientists, we supplement our cost-recovery program in the Imaging Center to help pay the service contracts on our JEOL 2000 Electron Microscope, our BioRad Confocal Microscope, and the Neurolucida workstation. This year our cost-recovery program took in $32,718, against $49,217 in service contracts and maintenance. In order to bring this NI supplement closer to our target goal of ~20% of these costs, we raised user fees in the Imaging Facility this year for the first time in 10 years. In addition, during FY 2010 we will seek a new contract with a third party to provide service for the JEOL 2000 in FY 2011, with substantial savings.

Start-up funds: Four new tenure-track neuroscientists recruited into the Department of A & N in 2002-2003, and a total of $500,000 was used toward startup funds for these investigators. This past year the final

$46,624 was expended.

Seminars and Symposia: Additional funds went to support travel ($13,550) and honoraria ($3,800) for Neuroscience Seminar series, the Brain Awareness Symposium in collaboration with the Urban Child Institute, a Learning and Memory Neuroscience Symposia, and a Translational Neuroscience Series on Autism. For the latter series, NI partnered with LeBonheur hospital, the Department of Neurology, Boling Center for Developmental Disabilities, and the Clinical Translational Science Institute at UTHSC **(see Appendix 4).**

Pilot Projects: NI spent $192,171 in Pilot Research projects in 2008-2009, and in support of the Neurotrauma Center at UTHSC. Clinical pilot projects received additional matching funds from the College of Medicine. These are detailed under **Goal 3** under Item **X** below.

B. 2009-2010. We will carryover $429,134 to the coming fiscal year, and have been appropriated $636,800 (a cut from $643,500 in 08-09), for a total of $1,065,934. The majority of the carryover is committed to Pilot Research projects and personnel. Here is a breakdown of the major anticipated projects:

Students: For the coming year, we have awarded matching funds for nine graduate stipends to PIs with graduate students on a competitive basis. We have reserved $100,000 for graduate stipends.

Seminar Series and Community Outreach: We will continue to fund the weekly Neuroscience Seminar series and will also sponsor more Neuroscience Symposia in the course of the academic year. We will continue to work with the Urban Child Institute to fund community outreach activities such as Brain Awareness Week. We will also continue to fund the summer Undergraduate Neuroscience Merit Fellowships to Rhodes and Christian Brothers University students who are doing research projects in Neuroscience towards fulfilling their degree requirements.

Neuroscience Imaging Center: We have submitted an application for a new spectral scanning, confocal microscope (Zeiss LSM 710) from NIH (National Center for Research Resources), for $468,446. The PI was NI Director Willam Armstrong, with 5 additional major users, and 7 minor users spanning departments of Anatomy and Neurobiology, Neurology, Pharmacology. This grant will be reviewed in Oct. of 2009 for a funding date of April 1, 2010. We also intend to invest ~$30,000 in an offline workstation for analyzing confocal images. This is something we wanted to do last year, but we waited because we were unsure as to what the budget cut would be, and whether or not we would receive Economic Recovery funds. We did receive these funds (see below). We also recently hired an assistant to our Technical Director for the Imaging Center. The assistant will cut sections for light and electron microscopy, increasing throughput. The assistant will be paid through cost recovery for her time.

NI Faculty: In addition to the administrative supplements provided to Drs. Armstrong, Reiner, and Elberger, we will commit another 2 years of partial salary support to Dr. Mike McDonald ($90,000 over 4 years) in the Department of Neurology. Dr. McDonald is a behavioral Neuroscientist, specializing in genetic models of Alzheimer's disease. His presence is critical to the further development of translational neuroscience

at UTHSC. He has finished his second year of NI support. Dr. McDonald was promoted to Associate Professor this year, and also has recently received two R01s from NIH.

Pilot Projects: The NI will commit $319,760 to support pilot research projects aimed at developing research grant applications during the next FY. Pilot project grants have been awarded largely during the fiscal year, and this amount reflects carryover from funds committed during FY 2009 to be spent during FY 2010, as well as new commitments to be awarded during FY 2010. The $9,900 carryover for FY 2011 reflects the salary support for the Neurotrauma Center during their third and final year. The projects represent collaborative efforts among NI members across disciplines and departments. The details of these projects can be found under **Goal 3, item X below.**

Schedule 7

CENTERS OF EXCELLENCE/CENTERS OF EMPHASIS
ACTUAL, PROPOSED, AND REQUESTED BUDGET

Institution UT Health Science Center **Center** Neuroscience

	FY 2008-09 Actual			FY 2009-10 Proposed			FY 2010-11 Requested		
	Matching	Appropr.	Total	Matching	Appropr.	Total	Matching	Appropr.	Total
Expenditures	0	0	**0**			**0**			**0**
Salaries									
Faculty	545,544	77,906	**623,450**	500,050	85,000	**585,050**	500,050	89,250	**589,300**
Other Professional	21,110	176,067	**197,177**	32,691	142,693	**175,384**	0	115,500	**115,500**
Clerical/ Supporting	22,109	46,906	**69,015**	30,228	62,131	**92,359**	34,097	30,532	**64,629**
Assistantships	71,743	94,031	**165,774**	137,636	127,750	**265,386**	118,136	105,000	**223,136**
Total Salaries	**660,506**	**394,910**	**1,055,416**	**700,605**	**417,574**	**1,118,179**	**652,283**	**340,282**	**992,565**
Longevity	801	4,333	**5,134**	850	4,650	**5,500**	1,454	3,780	**5,234**
Fringe Benefits	199,981	101,076	**301,057**	189,197	102,590	**291,787**	174,361	77,700	**252,061**
Total Personnel	**861,288**	**500,319**	**1,361,607**	**890,652**	**524,814**	**1,415,466**	**828,098**	**421,762**	**1,249,860**
Non-Personnel									
Travel	0	13,550	**13,550**	0	25,412	**25,412**	0	26,250	**26,250**
Software	191	192	**383**	0	30,000	**30,000**	0	0	**0**
Books & Journals	0	0	**0**	0	0	**0**	0	0	**0**
Other Supplies	12,267	92,349	**104,616**	42,867	149,808	**192,675**	0	208,478	**208,478**
Equipment	1,049	6,045	**7,094**	35,000	135,000	**170,000**	0	0	**0**
Maintenance	863	28,803	**29,666**	0	40,000	**40,000**	0	42,000	**42,000**
Scholarships	0	12,389	**12,389**	0	12,000	**12,000**	0	12,600	**12,600**
Consultants	0	3,800	**3,800**	0	4,000	**4,000**	0	4,200	**4,200**
Renovation	0	0	**0**	0	0	**0**	0	0	**0**
Other - Cost Recovery	0	(32,718)	**(32,718)**	0	(35,000)	**(35,000)**	0	(36,750)	**(36,750)**
Pilot Grants Encumbered			**0**			**0**	0	0	**0**
New Pilot Grants	0	0	**0**	0	160,000	**160,000**	0	0	**0**
WIFI	0	0	**0**	0	10,000	**10,000**	0	0	**0**
Total Non-Personnel	**14,370**	**124,410**	**138,780**	**77,867**	**531,220**	**609,087**	**0**	**256,778**	**256,778**
GRAND TOTAL	**875,658**	**624,729**	**1,500,387**	**968,519**	**1,056,034**	**2,024,553**	**828,098**	**678,540**	**1,506,638**
Revenue									
New State Appropriation		643,500	**643,500**		636,800	**636,800**		668,640	**668,640**
Carryover State Appropriation	19,554	410,363	**429,917**	88,726	429,134	**517,860**	9,900	9,900	**19,800**
New Matching Funds	944,830		**944,830**	889,693		**889,693**	818,198		**818,198**
Carryover from Previous Matching Funds			**0**			**0**			**0**
Total Revenue	**964,384**	**1,053,863**	**2,018,247**	**978,419**	**1,065,934**	**2,044,353**	**828,098**	**678,540**	**1,506,638**

FY 2008-2009 Carryover State Appropriation amount of $422,142 was reduced to $410,363 (difference of $11,779) because of residual balance in previous year's account.

III. EXTRAMURAL FUNDING OF NEUROSCIENCE FACULTY

The UT Neuroscience Institute remains one of the largest concentrated Neuroscience programs in the country and has achieved an international reputation as a preeminent center for Neuroscience in the United States. For FY08, the core department, Anatomy and Neurobiology, was ranked ***12th in the nation among all Neuroscience departments*** and ***7th in the nation among public medical schools***. As an Anatomy and Cell Biology department, A & N was ranked ***22nd overall*** (of 84) and **11th** among public medical schools. Other participating NI departments are also highly ranked by funding, including Physiology (6 funded NI members), which was ranked ***4th in the nation*** in 2009 by the Association of Chairs in Physiology (41 departments), and ***22nd overall*** (of 98).

The total annual grant dollars (direct costs) currently held by faculty associated with the UTNI at UTHSC (i.e., excluding affiliates) is $23,704,735. ***Given an investment by the State of Tennessee of ~$14.3 million over the past 24 years, Neuroscience faculty have generated approximately $281,928 million in external grant funds (direct costs only, largely from NIH). The additional indirect costs add significantly to that amount.***

The research grants (annual direct costs) currently held by individual faculty of the UTNI are listed by Principal Investigator in **Appendix 1**.

IV. HISTORY OF THE NEUROSCIENCE INSTITUTE

The State of Tennessee established the Neuroscience Center of Excellence at UTHSC in 1985, which was later designated as an Accomplished Center of Excellence by the Tennessee Higher Education Commission in 1988. In 1998, Chancellor William R. Rice designated the Neuroscience Center of Excellence as the University of Tennessee Neuroscience Institute, with dedicated space in the Wittenborg, Link and Johnson buildings. The Neuroscience Center of Excellence award provides funds to support graduate and postdoctoral education, to recruit and provide initial support to new neuroscience faculty, to renovate laboratory facilities, to purchase research equipment, to host symposia, a weekly seminar series, and for community outreach programs such those associated with Brain Awareness Week. The Director from inception until June of 2002 was Dr. Steven T. Kitai.

The program currently brings together over ninety neuroscience faculty members holding appointments in the Departments of Anatomy and Neurobiology, Medicine, Molecular Sciences, Neurology, Neurosurgery, Ophthalmology, Pathology, Pediatrics, Pharmaceutical Sciences, Pharmacology, Physiology, Psychiatry, and Surgery, and in the Department of Biochemistry and Cellular and Molecular Biology at the University of Tennessee, Knoxville. Strong affiliations are present with Methodist University Hospital, Le Bonheur Children's Hospital, St. Jude's Children Hospital, the University of Memphis, Rhodes College and Christian

Brother's University. The interdepartmental nature of the program and the collaborations fostered through the program provide the cross-disciplinary environment necessary for high quality neuroscience research, training and patient care.

In June of 2002, Dr. David V. Smith was recruited from the University of Maryland to serve as Chairman of the Department of Anatomy and Neurobiology and Director of UTNI. Dr. Smith appointed a new Executive Committee to help direct UTNI activities in 2002 and named Dr. William Armstrong as Co-Director. In Dec. of 2005, Dr. Smith became ill with a brain tumor, and NI Co-Director, Dr. William Armstrong, became acting Director. Dr. Armstrong has been permanent Director of NI since Dr. Smith's death in September of 2006.

In spring of 2006 the NI Executive Committee expanded to include more clinical neuroscientists like Drs. Mark LeDoux and Jim Wheless, and Professor of Physiology Charles Leffler. Dr. Tony Reiner, a professor in A & N, was named NI Co-Director in 2007, shortly after joining the Executive Committee. The latest member of the Executive Committee is Dr. Matthew Ennis, Chair of Anatomy and Neurobiology, who joined in 2008. In 2006, the faculty-organized research groups expanded to include 3 new Translational Neuroscience Focus Groups (described below). The NI participates in graduate education postdoctoral training, providing student stipends for the Neuroscience Track of the Integrated Program in Biomedical Sciences, and matching funds for postdocs and research associates on a competitive basis. NI faculty from diverse departments participate in the Neuroscience block of the Systems Biology introductory course, and NI members serve as course instructors for 4 core Neuroscience Track graduate courses: Functional Neuroanatomy, Cellular Neuroscience, Developmental Neuroscience, and Behavioral Neuroscience. This fiscal year, NI lost seven faculty members to attrition/relocation, and added three new members (see below).

V. FACULTY OF THE NEUROSCIENCE INSTITUTE

The Neuroscience Institute is currently comprised of 95 faculty members in several different departments on the UTHSC campus, including those with primary appointments at St. Jude Children's Research Hospital and at the University of Memphis and Christian Brothers University, and one faculty member at UT Knoxville. Faculty are listed with each department; those with primary appointments outside UTHSC or UTK are so indicated. Faculty shown in ***bold italics*** were recruited to the Institute in FY 2008-09.

Department of Anatomy and Neurobiology

William E. Armstrong, Ph.D., Professor and Director
John D. Boughter, Jr., Ph.D. Associate Professor
Joseph C. Callaway, Ph.D., Associate Professor
Angela Cantrell, Ph.D., Assistant Professor

Elissa Chesler, Ph.D., Assistant Professor (Affiliate, Oak Ridge National Labs)

Alessandra d'Azzo, Ph.D., Affiliated Professor (St. Jude)

Hong Wei Dong, Ph.D., Assistant Professor

Michael A. Dyer, Ph.D., Affiliated Assistant Professor (St. Jude)

Andrea J. Elberger, Ph.D., Professor

Matthew Ennis, Ph.D., Professor

Malinda E. C. Fitzgerald, Ph.D., Adjunct Professor (Christian Brothers Univ.)

Robert C. Foehring, Ph.D., Professor

Kristin Hamre, Ph.D., Assistant Professor

Detlef Heck, Ph.D., Associate Professor

Paul Herron, Ph.D., Associate Professor

Marcia G. Honig, Ph.D., Professor

Eldridge F. Johnson, Ph.D., Professor

Hitoshi Kita, Ph.D., Professor

Cheng-Xiang Li, M.D., Assistant Professor

Lu Lu, Ph.D., Assistant Professor

Peter J. McKinnon, Ph.D., Affiliated Associate Professor (St. Jude)

Guy Mittleman, Ph.D., Adjunct Associate Professor (Univ. Memphis)

James I. Morgan, Ph.D., Affiliated Professor (St. Jude)

Randall J. Nelson, Ph.D., Professor

Guillermo Oliver, Ph.D., Affiliated Associate Professor (St. Jude)

Melburn R. Park, Ph.D., Associate Professor

Anton J. Reiner, Ph.D., Professor and NI Co-Director

Reese S. Scroggs, Ph.D., Associate Professor

Richard J. Smeyne, Ph.D., Affiliated Associate Professor (St. Jude)

Douglas J. Swanson, Ph.D., Assistant Professor

Ryoichi Teruyama, Ph.D., Assistant Professor

Yiai Tong, Ph.D., Assistant Professor

Robert S. Waters, Ph.D., Professor

Robert W. Williams, Ph.D., Dunavent Professor

Yi-Hong Zhang, Ph.D., Assistant Professor

Jian Zuo, Ph.D., Affiliated Associate Professor (St. Jude)

Department of Biochemistry and Cellular and Molecular Biology, UT Knoxville

Rebecca A. Prosser, Ph.D., Associate Professor

Department of Medicine

Tai-June Yoo, M.D., Ph.D., Professor

Department of Molecular Sciences

Susan E. Senogles, Ph.D., Professor

Department of Neurology

Dominic M. Desiderio, Ph.D., Professor
Michael Jacewicz, M.D., Professor
Mark S. LeDoux, M.D., Ph.D., Associate Professor
Michael C. Levin, M.D., Associate Professor
Michael McDonald, Ph.D., Associate Professor
Thaddeus S. Nowak, Ph.D., Professor
Ronald F. Pfeiffer, M.D., Professor
William A. Pulsinelli, M.D., Ph.D., Semmes-Murphey Professor and Chairman
Lawrence T. Reiter, Ph.D., Assistant Professor

Department of Neurosurgery

Frederick Boop, M.D., Associate Professor
Christopher Duntsch, M.D., Ph.D., Instructor
James T. Robertson, M.D., Professor
Jon H. Robertson, M.D., Robertson Professor and Chairman
Alan Sills, M.D., Associate Professor
Jeff Sorenson, M.D., Assistant Professor
Shelly Timmons, M.D., Associate Professor
Zixiu Xiang, Ph.D., Assistant Professor
Qihong Zhou, M.D., Ph.D., Instructor

Department of Ophthalmology

Edward Chaum, M.D., Ph.D., Plough Foundation Associate Professor

Eldon E. Geisert, Ph.D., Professor

Allesandro Iannoccone, M.D., Assistant Professor

Monica M. Jablonski, Ph.D., Associate Professor

Tonia S. Rex, Ph.D., Assistant Professor

Jena Steinle, Ph.D., Associate Professor

Dianna A. Johnson, Ph.D., Hiatt Professor

Department of Pathology

F. Curtis Dohan, Jr., M.D., Associate Professor

Department of Pediatrics, Pediatric Neurology and LeBonheur Children's Hospital

Vicki Brewer, Ph.D., Assistant Professor, Pediatric Neurology, Le Bonheur

Dave Clark, M.D., Assistant Professor, Pediatric Neurology, Le Bonheur

Masanori Igarashi, M.D., Associate Professor, Pediatric Neurology, Le Bonheur

Kathryn McVicar, M.D., Assistant Professor, Pediatric Neurology

Amy McGregor, M.D., Assistant Professor, Pediatric Neurology, Le Bonheur

Freedom F. Perkins, Jr., M.D., Assistant Professor, Pediatric Neurology, Le Bonheur

Massroor Pourcyrous, M.D., Professor, Pediatrics

James W. Wheless, M.D., Professor and Chief of Pediatric Neurology, Le Bonheur

Department of Pharmaceutical Sciences

Duane D. Miller, Ph.D., Van Vleet Professor and Chairman

Department of Pharmacy

Collin Hovinga, Pharm.D., Assistant Professor

Department of Pharmacology

Suleiman W. Bahouth, Ph.D., Associate Professor

Alex M. Dopico, M.D., Ph.D., Professor

Kafait U. Malik, Ph.D., Professor

Kazuko Sakata, Ph.D., Assistant Professor

Shannon G. Matta, Ph.D., Professor

Burt Sharp, M.D., Van Vleet Professor and Chairman

Jeffery Steketee, Ph.D., Professor

Steven J. Tavalin, Ph.D., Associate Professor

Fu-Ming Zhou, M.D., Ph.D., Associate Professor

Department of Physiology

Ioannis Dragatsis, Ph.D., Associate Professor

Jonathan Jaggar, Professor

Charles W. Leffler, Ph.D., Professor

Kristen M.S. O'Connell, Ph.D., Assistant Professor

Helena Parfevona, Ph.D., Professor

Mitchell A. Watsky, Ph.D., Professor

Department of Psychiatry

Kenneth Sakauye, M.D., Professor and Vice Chair

Department of Surgery

Syamal Bhattacharya, Ph.D., Professor

University of Memphis

Ramin Homayouni, Ph.D., Associate Professor

Guy Mittleman, Ph.D., Professor

St. Jude Children's Hospital

Michael Dyer, Ph.D., Associate Professor

Alessandra D'Azzo, Professor

Peter McKinnon, Ph.D., Associate Professor

James Morgan, Ph.D., Professor
Guillermo Oliver, Ph.D., Associate Professor
Richard Smeyne, Ph.D., Associate Professor
Stanislav Zakharenko, Ph.D., Assistant Professor
Jian Zuo, Ph.D., Associate Professor

VI. AREAS OF NEUROSCIENCE RESEARCH

The research programs of the faculty of NI are diverse, representing most areas of modern neuroscience research. Within the program are several strong areas of research focus, where in many instances basic scientists and clinical investigators interact to investigate the mechanisms of diseases of the nervous system. In 2002 participating faculty organized into eight research focus groups, within which there is considerable intellectual interaction and collaborative research. In spring of 2006, 3 of these focus groups were expanded to include a Translational component emphasizing interaction between clinical and basic research groups.

Neurological and Neurodegenerative Disorders

Neurological diseases include disorders of the nervous system arising from nervous system malfunction or degeneration. Among these are the movement disorders (which include Parkinson's disease, essential tremor, Huntington's disease, dystonia, myoclonus, Tourettes's syndrome, paroxysmal dyskinesias, drug-induced dyskinesias, restless legs syndrome, spinocerebellar ataxias, spasticity, multiple system atrophy, and progressive supranuclear palsy), dementing diseases (notably Alzheimer's), primary motor diseases (such as amyotrophic lateral sclerosis and multiple sclerosis), and diseases of neurotransmission abnormality (such as epilepsy). The integration of genetic, cellular, and physiological information will be required to unravel the pathophysiology of each disorder and improve therapeutics. Due to aging of our population, movement disorders and dementing diseases will place an enormous and increasing financial burden on society. Investigations by this group will play an important role in the breakthroughs needed to understand and treat these diseases. Current areas of focus include: cellular and network physiology of basal ganglia in the context of Parkinson's disease, neurobiology of neuronal dysfunction and death in Huntington's disease, and molecular biology of synaptogenesis in dystonia. Faculty also study the potential protective effects of hypothermia on cerebral ischemic insults, Alzheimer's disease, and molecular mimicry in immune-mediated neurological disease.

Faculty:

M. LeDoux (head) *Neurology* R. Nelson *Anatomy & Neurobiology*

A. Cantrell	*Anatomy & Neurobiology*	T. Nowak	*Neurology*
I. Dragatsis	*Physiology*	R. Pfeiffer	*Neurology*
E. Geisert	*Ophthalmology*	W. Pulsinelli	*Neurology*
D. Goldowitz	*Anatomy & Neurobiology*	A. Reiner	*Anatomy & Neurobiology*
R. Homayouni	*Neurology/U of Memphis*	L. Reiter	*Neurology*
M. Jacewicz	*Neurology*	R. Smeyne	*Anatomy & Neurobiology/St. Jude*
H. Kita	*Anatomy & Neurobiology*	R. Waters	*Anatomy & Neurobiology*
M. Levin	*Neurology*	J. Wheless	*Pediatric Neurology/Le Bonheur*

Neuro-oncology

Primary brain tumors and tumors metastatic to the central nervous system are relatively common and associated with tremendous morbidity and mortality. The most prevalent form of adult primary central nervous system tumors is collectively referred to as glioma, and the most common and devastating glioma is glioblastoma multiforme. Despite dramatic improvements in neural imaging and neurosurgical techniques, the prognosis for high-grade gliomas has not improved significantly over the last 40 years. Clearly new therapies are needed to overcome the obstacles to treating brain tumors. The focus of the adult neuro-oncology group is to combine large-scale gene expression analysis of patients with brain tumors with cell and molecular studies of cell lines, tissues, and animal models of brain cancer. Research is directed towards the identification of genes associated with central nervous system tumors, understanding the mechanism by which genes affect intra- and extracellular tumor behavior, and the development of therapies that target these genes.

Faculty:

Jon Robertson (head)	*Neurosurgery*	A. Sills	*Neurosurgery*
F. Boop	*Neurosurgery*	J. Sorenson	*Neurosurgery*
C. Duntsch	*Neurosurgery*	Z. Xiang	*Neurosurgery*
Q. Zhou	*Neurosurgery*	***Shelly Timmons***	*Neurosurgery*

Excitable Properties of Neurons

Behavior, mentation and physiological homeostasis are all a function of neuronal activity in the nervous system. This activity can be encoded by membrane polarity or in the rates and patterns of neuronal action potentials. Information is passed among neurons through synaptic transmission. Whether a neuron fires at any given moment is determined by the interaction of intrinsic membrane properties with synaptic inputs. Research in this group focuses on these properties from several viewpoints. At the molecular level, studies determine the genetic capacity for producing proteins related to specific ion channels and neurotransmitter receptors.

Expression patterns of the proteins in classes of neurons impart a unique signature of ion channels and receptors. Electrophysiological recordings can reveal the properties of ionic currents underlying particular patterns of firing, the modulation of these currents by neurotransmitters, the precise properties of synaptic input, and the plasticity of neuronal activity. At a more global level, neuronal activity can be studied within an intact neuronal network and correlated with behavior. The common goal of this group is to understand how and why neuronal activity occurs in both normal tissue and in neurological disorders.

Faculty:

R. Foehring (head)	*Anatomy & Neurobiology*	P. Herron	*Anatomy & Neurobiology*
J. Callaway	*Anatomy & Neurobiology*	R. Nelson	*Anatomy & Neurobiology*
A. Cantrell	*Anatomy & Neurobiology*	R. Scroggs	*Anatomy & Neurobiology*
A. Dopico	*Pharmacology*	S. Tavalin	*Pharmacology*
W. Armstrong	*Anatomy & Neurobiology*	R. Waters	*Anatomy & Neurobiology*
M. Ennis	*Anatomy & Neurobiology*	R. Teruyama	*Anatomy & Neurobiology*
D. Heck	*Anatomy & Neurobiology*	S. Zakharenko	*Anatomy & Neurobiology/St. Jude*
H. Kita	*Anatomy & Neurobiology*		

Sensory Information Processing

Sensory systems extract information from the environment and provide the nervous system an interface with the outside world. Understanding the way in which this information is represented in neuronal activity is the focus of this research group. To understand sensory processing, we need to address the genetic basis of sensory function, the coding of information by individual sensory neurons at several levels of the nervous system, from peripheral receptors to cerebral cortex, and the role of the environment in shaping the responsiveness of these neurons through mechanisms of neuronal plasticity. Interactions between somatosensory and motor cortices, the effects of early alcohol exposure on sensory and motor processing, the control over gustatory information processing by descending influences from limbic forebrain, the genetics of taste processing, the processing of nociceptive (pain) information, and synaptic processing in the olfactory bulb are all areas of research addressed by this group.

Faculty:

M. Ennis (head)	*Anatomy & Neurobiology*	R. Scroggs	*Anatomy & Neurobiology*
J. Boughter	*Anatomy & Neurobiology*	R. Waters	*Anatomy & Neurobiology*
P. Herron	*Anatomy & Neurobiology*	Y.-H. Zhang	*Anatomy & Neurobiology*

E. Johnson	*Anatomy & Neurobiology*	R. Nelson	*Anatomy & Neurobiology*
C.-X. Li	*Anatomy & Neurobiology*		

Vision and Retina

We rely primarily on our sight to guide us through the world. Our eyes provide the major sensory input to the brain, accounting for one-third of the sensory axons entering the human nervous system. Understanding the normal function of the eye and the way this process is affected by disease is the primary interest of this group. Researchers are addressing the normal development of the eye as well as the genetic basis of function and disease. The current program reflects a comprehensive and synergistic approach to important fundamental questions of eye genetics and development and the application of this new strategy to the treatment of disease. These investigators seek to understand normal and abnormal ocular development and how genes control these events. There is an active program in the application of molecular techniques to the modulation of retinal cell growth and cellular responses to injury using gene therapy. Current areas of focus include prevention and treatment of eye diseases and disorders, eye genetics in development and childhood diseases, retinal degenerative diseases, anterior segment disorders, response of the retina and optic nerve to injury, and genetic control of eye development. The primary goal of the vision and retina research group is to provide a framework for effective communications between research laboratories effecting eventually the translation of basic research to clinical applications.

Faculty:

E. Geisert (head)	*Ophthalmology*	D. Johnson	*Ophthalmology*
E. Chaum	*Ophthalmology*	A. Reiner	*Anatomy & Neurobiology*
M. Dyer	*Anatomy & Neurobiology/St. Jude*	M. Watsky	*Physiology*
M. Fitzgerald	*Anat./ Neurobiology/Christian Bros.*	J. Zuo	*Anatomy & Neurobiology/St. Jude*
R. Williams	*Anatomy & Neurobiology*	T. Rex	*Ophthalmology*
A. Iannaccone	*Ophthalmology*	J. Steinle	*Ophthalmology*
M. Jablonski	*Ophthalmology*		

Neurogenetics, Development and Evolution

This group is interested in gaining a deeper understanding of the origins of the impressive structural and functional complexity, diversity, and plasticity of the nervous system. Experimental and technical expertise of this group is broad, ranging from genetic and molecular analysis of the early stages of central and peripheral

nervous system development to sophisticated functional assays of neuronal plasticity in response to environmental manipulations. The group is highly collaborative and includes a significant contingent of neuroscientists from St. Jude Children's Research Hospital (primarily the Departments of Developmental Neurobiology and Genetics). Current research tends to rely heavily on genetically defined lines of rodents. Topics of research interest include: control of cell cycling and cell death in the brain, control of axon outgrowth and neurotrophic interactions during neural development, the formation, elimination and stabilization of synapses, functional maturation and environmental/drug sensitivity of the developing nervous system, genetics of disease vulnerability and outcome, and mechanisms of cell migration in the developing brain.

Faculty:

R. Williams (head)	*Anatomy & Neurobiology/Pediatrics*	P. McKinnon	*Anatomy & Neurobiology/St. Jude*
J. Boughter	*Anatomy & Neurobiology*	G. Mittleman	*Anat./ Neurobiology/Univ. Memphis*
E. Chesler	*Oak Ridge National Labs*	G. Oliver	*Anatomy & Neurobiology/St. Jude*
A. d'Azzo	*Anatomy & Neurobiology/St. Jude*	M. Park	*Anatomy & Neurobiology*
I. Dragatsis	*Physiology*	A. Reiner	*Anatomy & Neurobiology*
A. Elberger	*Anatomy & Neurobiology*	L. Reiter	*Neurology*
K. Hamre	*Anatomy & Neurobiology*	B. Sharp	*Pharmacology*
M. Honig	*Anatomy & Neurobiology*	R. Smeyne	*Anatomy & Neurobiology/St. Jude*
R. Homanyouni	*University of Memphis*	D. Swanson*	*Anatomy & Neurobiology*
L. Lu	*Anatomy & Neurobiology*	Y. Tong	*Anatomy & Neurobiology*
J. Morgan	*Anatomy & Neurobiology/St. Jude*	R. Waters	*Anatomy & Neurobiology*

Mental and Addictive Disorders

Mental and addictive disorders are due to changes in normal brain function. This research group collaboratively explores changes in brain function that might explain mental disorders, such as depression and addiction, and drug-induced changes in brain function that may be responsible for relieving mental disorders or producing addiction. Research is currently being conducted using both *in vivo* and *in vitro* models. Molecular, cellular, neuroanatomical, neurophysiological, neurochemical, morphological and behavioral approaches are all being used to study the neuroscience of mental and addictive disorders. Research efforts are currently focused on depression and antidepressants and drugs of abuse, including cocaine, amphetamine, nicotine, ethanol and toluene. Several collaborative efforts currently exist within the group, including studies on drug effects on ion

channels, drug-receptor adaptations, developmental neuroplasticity and interactions between stress and drugs.

Faculty:

B. Sharp (head)	*Pharmacology*	J. Steketee	*Pharmacology*
A. Dopico	*Pharmacology*	S. Tavalin	*Pharmacology*
A. Elberger	*Anatomy & Neurobiology*	F. Zhou	*Pharmacology*
S. Matta	*Pharmacology*	K. Hamre	*Anatomy and Neurobiology*

Neural Cell Signaling

The function, growth and survival of neural cells are regulated by extracellular and intracellular signals. One example is the release of neurotransmitter from a presynaptic neuron, which is sensed by the postsynaptic neuron via receptors that recognize specific neurotransmitter molecules. This information is relayed to the cell's interior by a series of elaborate and interdependent signaling intermediates and results in a change in the cell in response to its environment. This diverse group of researchers is investigating those processes that are collectively referred to as signal transduction using neural or neural-derived cell systems. Indeed, most drugs that are currently used in the management of neurological disorders, such as ADHD, depression, schizophrenia, Parkinson's disease and others, exert their effects on signaling components. The goal of this group is to understand the involvement of signal transduction in both the normal functioning of neural cells and those pathological changes that are manifested in neurological disorders. Current areas of emphasis include: G-protein-coupled receptor signaling and regulation, growth factor receptor signaling, apoptosis, cellular migration, and mechanisms of neuronal injury and repair.

Faculty:

S. Senogles (head)	*Molecular Sciences*	M. LeDoux	*Neurology*
S. Bahouth	*Pharmacology*	K. Malik	*Pharmacology*
E. Chaum	*Ophthalmology*	J. Sorenson	*Neurosurgery*
C. Duntsch	*Neurosurgery*	S. Tavalin	*Pharmacology*
R. Foehring	*Anatomy & Neurobiology*	R. Waters	*Anatomy & Neurobiology*
T. Yoo	*Medicine*	D. Johnson	*Ophthalmology*
J. Jaggers	*Physiology*	M. Jablonski	*Ophthalmology*

Translational Neuroscience

The NI continues to promote **Translational Neuroscience**. Below is a description of three **Translational Focus Groups** and the outlines of their respective projects.

To maximize these efforts in the NI, three areas of emphasis have been identified: **Neurodegenerative Diseases, Developmental Neurobiology, and Drug Abuse (Brain, Mind and Behavior)**. These areas have been picked among others because of the existing core of NI scientists and, more importantly, because each problem has widespread visibility throughout Tennessee, demanding our attention and help.

Focus 1: Neurodegenerative Diseases (Leader, M. LeDoux, M.D., Ph.D., Neurology, UTHSC)

Human thought and behavior are a function of nervous system activity. Neurodegenerative diseases attack both, often simultaneously, and in the worst cases lead to years of debilitation and death, with the aged especially vulnerable. The substantial burden on the family as well as the health care system is obvious. Dissection of specific human neurological diseases in order to identify therapeutic targets and implement disease-modifying therapies requires expert clinical neurologists and neuroscientists with skill sets that cover the gamut from neurophysiology and neuropharmacology, to molecular neurobiology and neurogenetics. The NI contains several strong areas of disease-specific research, where basic scientists and clinical investigators interact to investigate the mechanisms of relatively common sensory-motor disorders like Parkinson's disease. Concomitantly, clinical neuroscience research related to many of the movement disorders is robust. Thus, the framework is in place at UTHSC for a vigorous program of translational Neuroscience research in the area of neurodegenerative diseases.

Neurodegenerative disease impacts a significant percentage of the U.S. population, and in many disorders the occurrence increases with age. For example, Parkinson's disease currently affects ~1.5 million people in the U.S., but 1 in 100 people over the age of 65 are afflicted, with the average age of onset being 60 years (National Parkinson's Foundation; CDC). Similarly, although the national prevalence of Alzheimer's disease is ~1.5% (afflicting some 4 million people), the frequency increases to 3% for men and women between ages 65-74, and it is estimated that 50% of those reaching 85 may have the disease (CDC; NIMH)! Multiple sclerosis currently afflicts some 400,000 U.S. citizens, but Tennessee has a rate higher than the national average. Neuropathy (a.k.a., neuritis), a peripheral nervous system inflammation producing pain, loss of sensation, and/or loss of muscular control, may be the most common single nervous system disorder, as it also accompanies many diseases of non-neuronal primary origin. Most notably, neuropathy accompanies 80% of the cases of type II diabetes, a disease found in some 8 million Americans and in a disproportionately high percentage of Tennesseans.

Translational Research Areas:

Support will focus on neurological disorders with expertise in the NI, and considered ripe for translational efforts. The primary effort of the NI will be on Parkinson's disease, Alzheimer's disease and multiple sclerosis. Presently there are clinical trials covering Parkinson's, Huntington's disease, dystonia, restless legs syndrome, neuropathy and multiple sclerosis in the UT Dept. of Neurology. An Alzheimer's specialist has recently been hired into this department as well. In support of this clinical research, many basic scientists in the NI are studying the related brain areas, including neuroanatomists, neurophysiologists and neurogeneticists. Statewide, the Division of Neurology at the UT Knoxville Department of Medicine has faculty with Alzheimer's expertise, and this campus also has two strong basic scientists studying the disease. Translational research initially will focus on the genetic basis of disease and its susceptibility to treatment. Disease-associated DNA polymorphisms and their gene products will represent a strategic target for the group.

Focus 2: Brain, Mind and Behavior (Leader, Burt Sharp, M.D, Chair, Pharmacology, UTHSC.)

The central nervous system is the target of the drugs that are abused by individuals at all ages. It is the reinforcing properties of these drugs that initially lead to abuse. Subsequently, long-term changes in brain chemistry and morphology take place, resulting in drug craving and severe disruption of normal behavior and social functioning. A translational approach to drug abuse research will foster interactions between basic and clinical investigators that engender a more powerful understanding of the impact of drugs of abuse on brain and behavior. Routine cooperation and collaboration between basic and clinical scientists will also result in the identification risk factors for abuse within subpopulations of Tennesseans, along with novel therapies that target high risk groups.

Memphis is no exception to the national trend in drug abuse and its co-morbid disorders (e.g., depression). Compared to 5 of its 8 neighboring states, Tennessee has higher rates of illicit drug use by its entire population (National Household Survey on Drug Abuse, 1999 and 2000). The association between depression and drug abuse is shown based on national figures. The high level of drug abuse amongst Tennesseans 12 years of age or older involves a large number of individuals: 286,000 persons per month used various illicit drugs (e.g., cocaine, marijuana), of which 48,000 were teens between 12 and 17 years of age. In addition, one million three hundred thirteen thousand (1,313,000) Tennesseans, age 12 or older, used tobacco – a known gateway to the use of illicit drugs. Of these, 78,000 teens used tobacco products. On a national scale, the interaction between illicit drug abuse and depression is demonstrated by the markedly increased prevalence of substance abuse among all individuals aged 12 or older who suffered a major

depressive episode during 2004: 28.8% of those who suffered a major depressive episode used illicit drugs compared to 13.8% of those who did not experience a major depressive episode. Moreover, the prevalence of heavy alcohol use or cigarette smoking was higher in those who suffered a major depressive episode (alcoholism 9.2% vs. 6.9%; cigarette smoking 25.5% vs. 15.1%).

Translational Research Areas:

- Drug abuse and co-morbid disorders

A major goal of this focus is the development of new definitions for clinical subtypes that depend on specific neurochemical, genetic and brain imaging patterns in patients, along with accurate behavioral profiling of antecedent history and response to intervention utilizing specific agents in clinical trials. These studies will entail reciprocal interactions between basic and clinical investigators, along with critical support from core facilities for genotyping (i.e. ID of single nucleotide polymorphisms, repeats, inversions, translocations, etc.) of probands and multigenerational families. fMRI imaging facilities will be critical in order to gain insight into brain dysfunction and its response to drug trials. Basic scientists will apply molecular, electrophysiological, neurochemical, behavioral and fMRI imaging technologies in animal models to understand fundamental aspects of the interaction between drugs of abuse and co-morbid disorders. Many of these interactions are based on known clinical observations, although novel clinical data, which further refine the hypotheses of basic neuroscientists, will undoubtedly derive from meticulous, high resolution, multi-parameter clinical studies. Our existing electrophysiological, neurochemical and behavioral equipment, facilities and faculty expertise in these areas are strengths of UTHSC. Existing genetic models along with novel knock-ins of homologous human mutations in mice will be powerful arrows in the quiver of basic scientists. This will require molecular expertise for the development of suitable genetic constructs and reliable, committed core expertise to generate, breed, validate and house recombinant mice. Adolescents are especially vulnerable to dependence on drugs of abuse, and this dependence is often a lifelong struggle. Therefore, initially, these studies will focus on adolescents in both human populations and animal models.

- Vulnerability to, and developmental effects of drug abuse

Vulnerability to drug abuse is little understood, but certainly varies with age, as do the effects of drugs of abuse on brain function. Both vulnerability to abuse and drug effects may in turn reflect age-dependent alterations in neuronal connectivity and neuron function within the brain regions and circuits that subserve the associative learning and reinforcing properties of drugs and the response to environmental stressors and co-stimuli associated with drug seeking behavior.

Thus, basic and clinical collaborations will identify biological markers of vulnerability to drug abuse in human populations and animal models of drug exposure initiated within the following time periods: gestation, adolescence, young adult, and geriatric. These studies will utilize the core fMRI imaging and genotyping technologies, along with the range of approaches mentioned in the foregoing paragraph. **This past year, we committed $40,000 in research funds to this area for pilot research in support of their attempts to achieve a Center great in the Developmental Effects of Drug Abuse from NIDA.**

Focus 3: Brain Development (Leader, Rob Williams, Ph.D.)

Understanding brain development is key to understanding adult cognition and behavior. Developmental dysfunctions can occur through inheritance, through pre- and perinatal trauma or toxicity, or even from the lack of meaningful social interaction during early life. The study of brain development is a major strength in the NI. Disorders with a strong clinical base (e.g., LeBonheur, Boling Center) include autism, learning disabilities, attention deficit disorders and epilepsy. Basic research ranges from genetic and molecular analysis of the early stages of central and peripheral nervous system development, to sophisticated functional assays of neuronal plasticity in response to environmental manipulations. We also anticipate considerable overlap with the Drug Abuse focus group as relates to brain development (see above). The group is highly collaborative and includes a significant contingent of neuroscientists from St. Jude Children's Research Hospital (primarily the Departments of Developmental Neurobiology and Genetics) and the University of Memphis. The genetics aspect in particular has received worldwide recognition in providing the Mouse Brain Library as well as other shared, web-based data sources. Last but not least, both clinicians and researchers in this area have strong ties to the Urban Child Institute to lead us out of the parochial realm of a medical school to be engaged and enriched by multidisciplinary approaches that focus on children aged 9 months to 3 years.

Translational Research Areas:

- Perinatal hypoxic ischemia

Hypoxic ischemia (HI) during perinatal life has a major, detrimental impact on the development of the nervous system, yet currently there is no effective neuroprotective therapy. Annually, it is estimated that neonatal stroke occurs in 4-5/1000 live births with an additional 20:1000 full-term births experiencing severe asphyxia. At least 25% of neonates suffering HI will develop some form of long-term debilitation, including mental retardation, a learning disability, epilepsy (also see below) and/or paralysis (NIH-NINDS)-this statistic may be an underestimate

since the symptoms of HI may go unrecognized until later childhood. While there can be multiple causes of HI, prime among these and over represented in the Memphis area is pre-eclampsia (maternal hypertension). Whereas improved perinatal care has increased survival rates for both term and preterm infants suffering HI, and there are effective treatments (e.g., magnesium sulfate) to control the maternal seizures that result from pre-eclampsia, the decrease in infant mortality has not been correlated with improved neurological outcomes, further stressing the need of therapeutic intervention during pregnancy. Furthermore, some treatments for the mother's condition may have untoward effects on fetal nervous system development. Additional risk factors that could potentiate the ill effects of HI are various sorts of maternal drug abuse (e.g., cocaine, heroin, alcohol), and even cigarette smoking.

Neonatology and the Boling Center are currently developing an expanded follow-up program for high-risk neonates that will be critical to the systematic measurement of outcome in these children. The governor's and mayors' special initiatives on reducing high levels of infant mortality in Tennessee, Memphis especially, highlights the importance of these areas. Model systems are being developed at the research end that include hypoxia chamber and the mouse ligation model, female self administration of nicotine prior to pregnancy, and cell culture hypoxia, that are seen to be the preclinical tools for validation of interventions and testing of causation. Significant interaction between this effort and that of drug abuse (see above) would be expected.

- Autism

Autism and associated autism spectrum disorders (ASDs) have received a major focus from funding agencies and represent an exciting window into understanding higher brain function. ASDs are brain development disorders that characterized by abnormal social interactions, communication abilities, patterns of interests, and patterns of behavior. Whereas NIH lists frank autism prevalence at about 0.1%, according to the National Autism Association, 1 in 150 children have an ASD. To date, researchers have found several genes associated with ASDs. Fortunately for UT, the study of ASDs has a strong clinical component at the Boling Center and UT Pediatrics. There is a core of basic scientists within the NI interested in ASDs, covering behavioral, genetic and neuronal developmental aspects of animal models. We have the potential to develop strong collaborations with the Univ. of Memphis and Vanderbilt University. **This past year, we co-sponsored an Autism research group and seminar series, with the Boling Center, LeBonheur Children's Hospital, and the Clinical Translational Science Institute. We will support this series in this FY. We funded one clinical Pilot Project (Dr. Kathryn MacVicar) in Pediatric Neurology, Le Bonheur Hospital/UTHSC, on serum protein analysis of autistic children. This project will run through 2011.**

- Pediatric Epilepsy

Epilepsy is a relatively common disorder affecting ~1% of the U.S. populace (Epilepsy Foundation; Center for Disease Control). More striking is that some10% of the population will suffer a seizure during their lifetime. Characterized by uncontrolled brain seizure activity, epilepsy can have with multiple origins (genetic, trauma) and a spectrum of seizure types. For children, the first year of life carries the highest risk, where seizures can be damaging and life threatening. Childhood epilepsy (~ ½ of the epilepsy cases nationwide) is more likely to be associated with genetic origins compared to adults, where stroke and accidents play greater roles). Epilepsy also targets minorities and those of lower socio-economic status with greater frequency. While in many cases seizures are well controlled with medication, a significant number of children are resistant to medical treatment, and other treatments carry significant side effects. "Designer drugs" for epilepsy provide increased hope of a better quality of life for many young patients with epilepsy.

Neurologists at Le Bonheur are investigating anti-seizure medications not yet on the market, and will be using state of the art magnetoencephalography to assess drug actions on human brain activity. This work could benefit from translational interactions as basic researchers discover the mechanisms of actions of anti-epileptic drugs and help refine compounds to more precisely target seizure activity while avoiding debilitating side effects. Additional neurophysiological investigation of excised, epileptic tissue would help uncover the mechanisms underlying epileptic foci. **We have funded a clinical Pilot Project to Dr. David Clarke in Pediatric Neurology, Le Bonheur Hospital/UTHSC, to study brain activity (high density EEG) in sickle cell patients. This project will run through 2011.**

VII. FACULTY PUBLICATIONS

The Neuroscience faculty at UT is consistently productive, both in terms of peer-reviewed publications and participation in the national neuroscience community. **Their competitiveness for extramural funding is the strongest possible measure of the faculty's excellence**, as it reflects not only the quality of their research and publications, but also their national and international reputations. Lists of 1) peer-reviewed journal publications during the last academic year, as cited in PubMed, and 2) presentations at the 2008 meeting of the Society for Neuroscience in Washington, DC, are presented in **Appendix 2**. These PubMed-cited publications do not include the many chapters, reviews and other articles written by UTNI faculty. Faculty members of UTNI are indicated in **bold** in **Appendix 2**.

VIII. GRADUATE AND POSTDOCTORAL TRAINING

The Graduate education at UTHSC has moved away from department-based graduate programs to a single Integrated Program in Biomedical Sciences (IPBS) for students in the health sciences. Students matriculate into this integrated program, which in its first year requires broad interdisciplinary training in cell and molecular biology and in systems biology. Within the IPBS, each student chooses one of a number of tracks, of which Neuroscience is one. Students who enter the graduate program are eligible for predoctoral stipends and a waiver of tuition. The Neuroscience Institute has switched from funding stipends for the first two years for students in the Neuroscience Track, to competitively awarding matching funds to students after they are placed in a mentor's lab. UT has agreed to pay all IPBS stipends prior to placement in labs.

Students in the Neuroscience track take a sequence of several graduate courses. In the first year, students enroll in Cell and Molecular Biology, Neuroscience Seminar, Systems Biology (which includes the nervous system), and Neuroscience Student Symposium. In future years, each student continues with Neuroscience Seminar and Neuroscience Student Symposium and must take Functional Neuroanatomy. In addition, the student chooses two elective courses from among Cellular Neuroscience, Behavioral Neuroscience or Developmental and Molecular Neurobiology. A wide variety of additional courses are available to Neuroscience graduate students on the UTHSC campus, including courses in biochemistry, physiology, pharmacology, histology, and genetics.

In addition to their coursework, graduate students register for four laboratory rotations during the first year of graduate study in order to help them choose a research mentor. They typically enter a laboratory during their second year and begin to acquire the specialized training they will need to complete their doctoral dissertations. The Ph.D. degree is granted through the College of Graduate Health Sciences. The degree requires a minimum of six semesters of graduate work and normally requires from three to five years to complete.

During the past academic year, the NI supported one minoriry graduate student fully and awarded matching stipends to 6 others. In addition one postdoctoral fellow was supported with matching funds; all the rest were supported by individual research grants to the NI faculty. Two graduate students previously supported by the NI were awarded the Ph.D., both within the Department of Anatomy and Neurobiology. NI has taken a more active role in the national recruitment efforts for the graduate program (see Goals below and **Appendix 4**).

IX. NEUROSCIENCE SEMINARS

During the 2008-2009 academic year, the UTNI sponsored the weekly Neuroscience Seminar Series, hosting 22 seminars. Of these, 17 neuroscientists from outside and 5 within the NI presented their recent research findings to UT faculty and students. the NI seminar series serves as the basis for a graduate course, Neuroscience Seminar (ANAT 821), which is attended by all neuroscience track IPBS graduate students and

within which they read papers by and meet with the visiting scientists. This seminar program is vital to the Neuroscience Track of the Graduate Program and to the entire UT neuroscience community, serving to keep our faculty and students abreast of recent developments and, perhaps even more important, to showcase our strengths to national and international leaders in neuroscience research visiting our campus. NI also assists in the Student Seminar course (course director William Armstrong), where students give seminars and receive critical feedback from their colleagues. A complete list of FY 2008-2009 seminar speakers and their topics is provided in **Appendix 3**. In addition, the NI sponsored a Learning and Memory Symposium with internationally renowned speakers Dan Johnston and Wendy Suzuki. Dr. Robert Foehring of NI organized the symposium and mediated the proceeding. NI member Randy Nelson also presented his research. NI also co-sponsored a Translational Neuroscience Series on autism with 8 speakers. Flyers for the symposium and the autism series can be viewed in **Appendix 4**, as can the flyer for a symposium during Brain Awareness Week, co-sponsored with the Urban Child Institute, on "Food For Thought: What to Eat for a Better Brain". This symposium had almost 200 attendees and was well advertised through several news articles in the Commercial Appeal (**Appendix 4**).

X. GOALS OF THE INSTITUTE AND RECENT ACCOMPLISHMENTS

Four long-range goals of the UT Neuroscience Institute were established in 1985. These were set to promote excellence in Neuroscience research, education and patient care and to facilitate public awareness of Neuroscience efforts at UT. While these goals are generally current, we have pursued fostering the development of clinical Neuroscience research this past year, and will do so more in the coming year. The details are provided under

Goal 1. Augment our already strong research efforts in Neuroscience by a) recruitment of new faculty, b) renovation of facilities, c) acquisition of equipment, d) developing major programmatic activities, and e) creating a focal point to promote the exchange of information among our research faculty.

1a. Faculty recruitment. During the past academic year, 3 new faculty members became affiliated with the UTNI:

1b. Renovations. With the exception of the Imaging Center, NI is not assigned space as such. Renovations of participating membe's space were completed in 2002, with the completion of level 3 Wittenborg building. NI participating departments primarily occupy ~64,000 sq. ft of modern lab and office space in the adjacent Wittenborg (all floors), Link (two floors) and Johnson (1 floor) buildings, which house the Anatomy and Neurobiology, Neurology, and Neurosurgery departments. Additional NI members occupy substantial

laboratory space within their respective departments. Of particular note are several members of the NI in the Pharmacology department, housed in the Crowe building on the same quad as the three aforementioned buildings. However, the Crowe and Nash buildings housing Pharmacology and Physiology are in dire need of renovation. Plans for a new research building currently underway may satisfy those requirements instead.

1c. Acquisition of equipment/Imaging Center During the past year, NI continued startup funds for faculty initially recruited in 2002-2003, which went for primarily supplies and equipment in their laboratorie. This phase of startup funds is now complete, and NI will assist with new Neuroscience recruits in the future. In the past, NI has contributed matching funds for multi-user equipment grants, including those obtained from NIH for an electron microscope, for two confocal microscopes, for a computerized light microscope for three-dimensional neuronal reconstructions, and a high resolution digital camera attachment for the electron microscope, all are located in the Neuroscience Imaging Core and are maintained and supervised by a dedicated Technical Director (Kathy Troughton) provided by the NI. The web site for the Imaging Center is constantly refreshed: (http://www.utmem.edu/neuroscience/imaging-center/index.php?doc=m_content.inc). We now have on line scheduling this year. Our Bio-Rad confocal microscope is no longer covered by a service contract, and as mentioned previously, we have applied for a modern spectral scanning laser confocal scanning microscope this year to replace the BioRad.

1d. Developing major programmatic activities. Several areas of research focus exist within the NI and are consolidated into eight research groups. These areas include: 1) Neurological and Neurodegenerative Disorders, 2) Neuro-oncology, 3) Vision and Retina, 4) Neurogenetics, Development and Evolution, 5) Sensory Information Processing, 6) Excitable Properties of Neurons, 7) Mental and Addictive Disorders and 8) Neural Cell Signaling. These areas of focus provide for interaction among faculty in different departments and promote collaborative research activities, focused journal clubs, and other programmatic interactions conducive to interdisciplinary neuroscience research and training. The details of this organization are provided above.

In the Spring of 2006, we expanded three of these areas to include Translational Focus Groups: Neurodegenerative Diseases, Developmental Neurobiology, and Drug Abuse (Brain, Mind and Behavior). The goals and relationship of these focus areas to the other groups and the NI are detailed in Future Goals below. These areas have been picked among others because of the existing core of NI scientists and, more importantly, because each problem has widespread visibility throughout Tennessee, demanding our attention and help.

In the past two years, the NI has embarked on a mission to support the acquisition of large scale, programmatic grants by supporting Pilot Research grants, and to further clinical neuroscience research on campus. Current funded examples of the types of projects we seek are Dr. R. Williams Human Brain project, which established an informatics center for mouse neurogenetics. Dr. Williams was recently named to a Tennessee Governor's Chair in Computational Genomics through Partnership between Oak Ridge National

Laboratory. Other programmatic, large scale funding stems from a Vision Core grant to Dianna Johnson from the National Eye Institute, and several multi-investigator projects funded through NIAAA. Recently, NI has supported with the pilot research program the Program Project Grant of Dr. Burt Sharp in Pharmacology on neonatal effects of drug abuse. This project received very good reviews and a good score, but will probably have to be resubmitted for funding one more time.

UTNI projects that may be of particular value to **Tennessee industry, government or culture** are:

- Basic science projects address the underlying causes of the devastating neurodegenerative disorders, Alzheimer's disease, Huntington's disease, and Parkinson's disease. A significant fraction of the Tennessee population will be affected by these disorders, either as a victim or a caregiver. Any progress made toward understanding the mechanisms of these diseases or developing therapeutic options will have a positive impact on the citizenry through increasing health and longevity and decreasing the economic burdens imposed by these disorders.
- Basic science research on fetal alcohol effects on brain development. There is a relatively high incidence of prenatal effects from substance abuse among the Tennessee population. Projects also address the interaction of alcoholism, stress and genetics to determine if there are preventable combinations. Absences, injury and lack of productivity due to substance abuse in adults is a significant problem in Tennessee.
- Ongoing efforts to develop drugs to treat brain cancers, especially glioblastomas.
- Investigation of the cellular mechanisms of adult brain tumors, especially glioblastomas, in an effort to understand and control cell proliferation in patients with these tumors.
- Research to determine whether remediation of functions (such as basic forms of learning and memory) can be obtained with endogenous trophic proteins in a rat model that mimics some aspect of Alzheimer's disease.
- Research on the basis of neurodegenerative diseases of the eye and brain, which helps to provide insight into therapies to combat such diseases. The goal is to learn how to keep eyes and brains healthier for longer in Tennesseans and all other people.
- Ongoing research on the behavioral biology of addiction, including nicotine and alcohol addiction, depression, and stress.
- The NI faculty participate heavily in a number of educational programs for minority students, as delineated below.

1e. Creating a focal point to promote the exchange of information among our research faculty. The organization of the UTNI into research focus groups is a primary means of promoting interactions among NI faculty and students. In addition, there are several other avenues for the exchange of information:

1) Over one thousand posters describing the interdisciplinary Graduate and Postdoctoral Program in Neuroscience are distributed yearly to undergraduate institutions in Tennessee and nearby states.

2) The UTNI Neuroscience Seminar series is a major mechanism for interaction among neuroscience faculty and students and brings outstanding neuroscientists from around the world to the UTHSC campus. During the past year, there were 33 seminars: 28 by visiting neuroscientists and 5 by UTNI faculty. Announcements are mailed to all participating faculty and students and are posted at various points throughout the UTHSC campus.

3) Two web servers are housed in the UTNI. One provides information on the NI and is a recruitment tool to attract first-rate neuroscience students and faculty. This site, at http://www.utmem.edu/neuroscience, has been expanded and now includes all of the services offered by the Neuroscience Imaging Core, the efforts behind our Translational Neuroscience Research and Pilot Program initiatives, Neuroscience Undergraduate Scholars, Neuroscience Track students, among other items. The other server, is run by Prof. Rob Williams and offers Neuroscience faculty worldwide an avenue to present their research findings and search neurogenetic data, and is used daily by more than 100 scientists throughout the world. The servers may be found at: http://www.nervenet.org/main/databases.html and include the Mouse Brain Library, Complex Trait Analysis, Virtual Microscopy, Web QTL Project, among others.

Goal 2. Promote education and research training in Neuroscience at the predoctoral (including undergraduate and graduate students, dental, medical and other professional students and minority students) and postdoctoral (including Ph.D.s, interns and residents) levels of students at UT and other Tennessee institutions.

2a. In conjunction with the ***NIH Medical Student Research Fellowship Program*** in the College of Medicine, NI faculty offered summer laboratory experiences to the following medical students:

University of Tennessee College of Medicine
NIH Medical Student Research Fellowship Program
2009 Summer Research Fellows

Student	**NI Preceptor, Department**	**Project Title**
Clement, Parker W.	Jonathan Jaggar, Ph.D. Professor, Physiology	Identification of the $Ca_v1.2$ a $_1$ N-terminal sequence within human smooth muscle cells and its effects on cardiovascular disease
Desai, Siddharth	Tonia Rex, Ph.D. Assistant Professor, Eldon Geisert, Professor,	Regulation and quantification of retinal transgene products *in vivo* cell carcinoma by targeting the NF-κB pathway

	Ophthalmology	
Mehta, Neal	Michael Dyer, Ph.D. Affiliated Associate Professor, Anatomy and Neurobiology	Development of an ocular formulation of nutlin-3a for retinoblastoma
Roberts, Michele	Michael Levin M.D. Professor, Neurology	Molecular mimicry in immune mediated neurologic disease: identification of core epitopes of a neuronal auto-antigen in patients with multiple sclerosis
Trussel, John	S. Bhattacharya, Ph.D. Professor, Surgery	Pretreatment with amlodipine to prevent myocardial $Ca^{2=}$ Overloading in rats with isoproterenol-induced cardiac failur
S. Bhattacharya	S. Bhattacharya, Ph.D. Professor, Surgery	Cardioprotective effects of $ZnSo_4$ treatment in rats with isoproterenol-induced myocardial injury
Vantrease, Allen	Monica Jablonski, Ph.D.. Associate Professor, Ophthalomology	NA3 as a pre-clinical model for age-related macular degeneration

2b. Training for underprivileged students continues to be active and supported by NI neuroscientists and their laboratories through funds from the state of Tennessee, the college of Pharmacy, and Rust College. Currently, NI involvement is housed under the **Prescience Program** (part of a Summer Research Scholars Program administered by UTHSC graduate college), which provides financial support for summer research internships, and is administered by NI member Prof. E. J. Johnson. The **Prescience Program** provides basic science career exposure (research laboratory apprentice-preceptorship) and basic science skills reinforcement activity for scholarly oriented high school and college minority students. Students are paired with an undergraduate apprentice with a Ph.D. or M.D. biomedical scientist preceptor in a one-to-one relationship. This association and environment are designed to inform the student of the undergraduate prerequisites and essential course work that are required to pursue doctoral studies and to inform them of the demands and relevance of communications skills, mathematics, and science to the conduct of biomedical research.

2c. This year marks the fourth year for awarding ***Undergraduate Neuroscience Scholarships*** to outstanding undergraduates at Rhodes College and Christian Brothers University. These scholars are picked by the respective institutions for their interest in Neuroscience and their academic performance, and placed in NI labs at UTHSC for two summers. The scholars work on independent projects for their undergraduate thesis. The new scholars for 2009 are Cameron Kasmai from Christain Brother Univ. (Dr. Detlef Heck) and Leslie Baker of Rhodes College (Dr. Fu-Ming Zhou). One of last year's scholars, Michael Antone, presented a poster at the Christian Brothers Research Day (**Appendix 4**).

2d. In 200-2009 NI also supported ***recruitment of graduate students into the Neuroscience Track of Interdisciplinary Program for Biomedical Sciences by creating and circulating a flyer to 200 different undergraduate biology, psychology, and neuroscience programs nationwide.*** A copy of the flyer can be

found in **Appendix 4.** An updated flyer will be distributed in September, 2008. This past year NI provided full support to Ms. Jeri Bryant, a minority student. In addition, NI provided matching travel funds for all students presenting their work at national meetings. Our intention for the coming FY is to provide matching funds for stipends to NI faculty on a competitive basis, in support of neuroscience track graduate students in the IPBS graduate program. We recently pledged matching funds for 5 Neuroscience Track students for FY 2008-09.

Goal 3: Hasten the application of the latest and most promising scientific information to the clinical treatment of neurological diseases (*e.g.*, Parkinson's disease, Alzheimer's disease, stroke, spinal cord injury, neurotrauma, brain tumors, and multiple sclerosis) by integrating educational and research programs.

3a. The Neuroscience Seminar series, conferences and workshops encourage participation by the faculty, and collaborative research activities, especially those between basic scientists and clinical faculty. Several of the research focus areas of the NI are devoted primarily to study of the basic biology of human disease, including the groups for Neurological and Neurodegenerative Disorders, Neuro-oncology, Vision and Retina, and Mental and Addictive Disorders. This aim was addressed by the Autism seminar series held at Le Bonheur Hospital discussed above (**Appendix 4**). This series focused on the genetics of autism, and featured clinical and basic scientists, attempting to determine the genetic components of this complex disorder.The NI will continue to support clinical, patient based and translational Neuroscience at UTHSC by helping to equip the Neuroscience Imaging Core with cutting edge neurobiological imaging tools, and by pilot translational grants. We have partnered with the Department of Neurology in the hiring of Michael McDonald, a mouse behaviorist specializing in genetic models of neurological disease. The NI pays a part of Dr. McDonald's salary for 4 years, and provides his office space. We also expect to work closely with the Clinical Translational Science Institute. The Neuroscience Imaging Core is partnering with the CTSI, and Dr. Armstrong serves as Director of Imaging in the Research Technical Unit, for the CTSA application currently in revision.

3b. Pilot Research and Other Projects funded by NI. During 2008-2009 the NI and its Executive Committee continued programmatic support of Neuroscience Research on campus. This included continued funding of two separate pilot project lines, one open to clinical and basic neuroscience research, one only for patient-based research**.** We spent $192,171 this past year, and we have committed $319,760 for FY 2009-2010. The clinical projects are matched by COM.

-**Basic Science**. In 2008-2009 the NI continued support for neuroscience research projects aimed at developing large-scale NIH grants. Two $40,000 grants were awarded for a second year after merit review: Burt Sharp, M.D., Professor and Chair of Pharmacology; and Tonia Rex, Ph.D., assistant professor in Ophthalmology **(please see announcements in Appendix 5**). The projects were initially awarded Feb. 1, 2008-

Jan. 31, 2009, and were renewed Feb. 1, 2009 for 1 year. Dr. Sharp's project led to his submission of a Program Project Grant from NIDA. This project was approved for funding but will probably not be funded this year due to the NIH payline. Dr. Sharp will resubmit a revised grant in Fall of 2009. Projects under Tonia Rex's project led to the approval and probable funding of a grant by Dr. Mike McDonald, who was a co-I with Dr. Rex on the pilot project.

-**Clinical Research.** The NI approved five Clinical Neuroscience research pilot projects aimed at developing clinical scientists and facilitating their ability to achieve NIH grant (**please see announcements in Appendix 5**). Of these, Dr. Mark LeDoux, M.D., Professor of Neurology ($80,000) has begun his second year of funding. Drs. Massroor Poucyrous, M.D., Professor of Pediatrics ($50,000, Dave Clarke, Assistant Professor of Pediatrics ($50,000), and Kathyrn MacVicar, Assistant Professor of Pediatrics ($50,000) have begun their first year of funding in 2008-2009 and will be eligible for a second year in 2010. Dr. Alex Auchus, M.D., Professor of Neurology ($50,000), completed a year of study, and will not renew since he has left UTHSC effective Aug. 1, 2009. The amounts reflect the total support, which includes 50% matching from the College of Medicine.

-**Neurotrauma Center**. The NI continued is co-sponsorship with the College of Medicine to support a Neurotrauma Center where ongoing clinical trials on head injury are being carried out. The NI supports the research coordinator of this Center, which is directed by NI member Shelly Timmons, MD (Neurosurgery). This in 2008-2009 Dr. Timmons received ~$30,000 from NI, an amount matched by the COM. The NI commitment for FY 2009-2010 is $19,800 NI + $19,800 from COM.

-**Postdoctoral Research Awards.** The NI approved matching funds on a competitive basis for 5 postdoctoral fellows or research associates for FY 2009-2010. These awards are $15,000 each. The call for applications can be found in **Appendix 5.** However, these funds are not shown on the Schedule 7 as they are being paid from economic stimulus funds passed from the federal government to the state under the AARA. We have been awarded stimulus funds for 2010-2011, so we hope to continue this support a second year.

Goal 4: Interact with the faculty of other UT campuses and neighboring undergraduate institutions

Some UTNI faculty are involved in some large multi-institutional grant programs, involving a number of universities (listed above). There is considerable collaboration between UTNI faculty on the UTHSC campus and investigators at St. Jude Children's Research Hospital and at the University of Memphis.

In addition to research collaborations, we continue to sponsor the Neuroscience Seminar Series on the UTHSC campus, which is often attended by faculty and students from other Memphis institutions, and our faculty are involved in workshops and seminars at other institutions and at national meetings. Our Translational Neuroscience Symposia bring together clinical and basic research scientists from our various local sites and outside speakers.

The UTNI continue their community interaction with the First Year's Institute and the Urban Child Institute

with a **community forum** during **Brain Awareness Week** at the Urban Child Institute. This program, entitled **"Food for Thought: What to Eat for a Better Brain",** was directed toward parents, teachers, and other professionals involved in the care and early instruction of children. The program was organized by NI member Dr. Paul Herron, and was hosted by NI Director William E. Armstrong. Two talks on were featured. Dr. Fernando Gomez-Pinilla (UCLS) spoke on how food groups such as Omega-3 fatty acids affect learning and memrory, and recovery from brain injurty. Dr. Patricia Wainwright of the University of Waterloo (Canada) spoke on genral dietary supplements and their potential roles in improving brain function . Nearly 200 parents and healthcare professionals attended this event, which generated considerable discussion among the participants. The flyer on this Brain Awareness Week event is provided in **Appendix 4**, as several articles from the Commercial Appeal highlighting this event.

APPENDIX 1

External Funding of Neuroscience Institute Faculty

FY 2008-2009

P.I.	*Project Name*	*Agency*	*Project Period*	*Direct Costs FY 2008-2009*
Armstrong, W.	Electrophysiological Correlates of Vasopression Release	NIH	12/01/08 11/30/09	$203,695
Auchus, A.	EISAI-Pfizer Study	Clinical Trial	09/24/07 06/30/11	$72,374
	Elan Pharm (301 Study)	Clinical Trial	05/21/08 12/31/10	$281,511
	Elan Pharm (302 Study)	Clinical Trial	05/21/08 12/31/10	$209,783
Bahouth, S.	PKA-targeting: A novel mechanism for GPCR resensitization	NIH	12/16/08 11/30/09	$250,000
Boughter, J.	Genetic Dissection of a Motor Central Pattern Generator	NIH	01/01/08 12/31/09	$162,340
	Sensory Coding in Taste	NIH	08/01/08 07/31/10	$248,308
	Central Pathways for Amino Acid Taste and Preference in mice	Ajinomoto Co Agmt-Boughter	04/01/09 03/31/10	$98,578
Cantrell, A.	Ion Channel Dysfunction in Huntington's Disease	NIH	09/01/07 08/31/09	$180,154
Chaum, E.	Automated Screening for Diabetic Retinopathy by Content-based Image Retrieval	NEI/NIH, UT/ORNL	09/30/00 08/31/12	$86,132
	Age-Related Eye Disease Study II (AREDS II Clinical Center Award	NEI	06/01/06 12/31/12	$7,213
	Plough Professorship in Vitroretinal Disease	Plough Foundation	11/30/99 Indefinite	$83,383
	Electrochemical Quantification of Serum Propofol Levels for Target-Controlled Infusion Anesthesia-Army Cont	US Army TATRC	05/25/05 01/19/10	$156,614
	Molecular Responses to Oxidative Stress in the Retinal Pigment Epithelium Validation of Anti-Oxidant Effects on RPE Gene Expression	Private Industry	06/16/08 01/21/10	$97,386
	Training, Access, Education and Management for a Life that's Sugar Free	Private Industry	09/01/07 08/31/09	$56,789

Desiderio, D.	Chiesi Farmaceutici	Contract	03/30/07 03/29/10	$619,844
	Cornell Subcont	Contract	09/01/07 08/31/08	$94,113
Dohan, F.C.	Support Fund	Gift	Permanent	$50,000
Dong, H.W.	Activity-Dependent Plasticity of Sensory Synapses in the Olfactory Bulb	NIH	07/01/08 06/30/09	$50,000
Dopico, A.	Nongenomic Bile Acid on Smooth Muscle BK Channels	NIH	05/01/07 04/30/09	$118,523
	Ethanol Actions on slow Channels from Arteries vs. Brain	NIH	04/01/08 07/09/10	$193,340
Dragatsis, I.	Need for huntingtin in the mature CNS	CHDI Foundation, Inc	5/1/2008 04/30/10	$124,750
	Role of NGF in Familial Dysautonomia	NIH	04/01/08 03/31/12	$218,750
Elberger, A.	Mechanisms of Effects of Lead Candidate Cannabinoid Analogs of Glioblastoma Multiforme and Lung Cancers	Endece LL Supplement 3-Elberger	07/01/08 06/30/09	$150,230
Ennis, M.	Computational Experimental Analysis of Noradrenergic Function in Early Sensory Processing	Cornell Univ Subcont	07/01/08 06/30/09	$86,350
	Metabotropic glutamate Receptors in the Olfactory Bulb	NIH	01/01/09 12/31/09	$209,738
Foehring, R.	The Role of GABAergic Inhibitory Interneurons Circuitry in Fragile X Syndrome	NIH	07/01/08 06/30/09	$218,750
Geisert, E.	Modulators of Retinal Injury	NEI	09/01/07 08/31/11	$304,829
Goldowitz, D./ Hamre, K.	Pleiades Promoter Project	University of British Columbia	01/01/06 12/31/09	$395,828
Hamre, K.	SBIR (Phase II) Mouse Transciptomic fingerprints as biomarkers for chronic alcohol	Genome Explorations Subcont	09/01/07 08/31/09	$102,643

	Mapping Cerebellar Development in Time and Space	NIH	07/01/08 06/30/09	$555,336
	SBIR (Phase I) Development of NIAA Correlational Database	Genome Explorations Subcont	09/30/07 02/28/09	$26,150
	Gene to Phenotype networks for Alcohol and Drug Addiction "NINIA Mouse Resources Core"	University of British Columbia	07/01/08 06/30/09	$77,165
	Analysis of surviving math1-nul hair cells in the inner ear of chimeric mice	NIH	12/01/08 11/30/09	$125,000
	Mouse Research Core	University of British Columbia	02/01/09 01/31/10	$65,260
Heck, D.	Use of Dynamic Photostimulation to investigate synaptic Integration in Vivo	NIH	07/01/08 06/30/10	$90,000
	Role of DAb21Pin Brain Development	Univ Memphis Subcont	08/01/08 07/31/09	$27,658
	Coordination of respiratory and oralfacial movements	NIH	03/01/09 02/28/10	$218,750
	The role of Inhibition in shaping Neocortical Activity in Normal and Fmr1 Knock Out Mice	NIH	03/01/09 02/28/10	$45,000
	Cerebellar Modulation of Frontal Cortical Function	Univ Memphis Subcont	03/01/09 02/28/10	$74,457
Homayouni, R.	Role of Dab2IP in Brain Development	NIH	08/01/06 07/31/10	$215,430
Honig, M.	Sensory Axon Pathfinding	NIH	07/01/08 06/30/09	$174,780
Iannaccone, A.	Epidemiology of Carotenoids Inflammation, and Genetic Markers in Age-Related Macular Degeneration	International Retinal Research Foundation	04/01/02 12/31/09	$175,074
	Career Development Award	Research to Prevent Blindness	01/01/03 12/31/09	$200,000
	Retinal Degeneration Research Fund	Private Donor	04/08/09 04/07/10	$10,000

Jablonski, M.	Macular Degeneration Research Fund	Private Donor	05/22/00 08/21/10	$27,850
	Molecular Basis of Late-Onset Retinal Degeneration	UC	06/01/08 05/31/09	$19,456
Jaggar, J.	Mitochondrial regulation of calcium signaling	NIH	03/11/05 02/28/10	$130,781
	Calcium Signaling in Cerebral Arteries	NIH	04/01/09 03/31/13	$273,862
Johnson, D.	Core Grant for Vision Research	NEI	04/01/05 03/31/10	$347,309
Kita, H.	Physiology and Anatomy of the Basal Ganglia	NIH	12/01/05 11/30/09	$452,811
	Rhythmicity and Synchrony in the Basal Ganglia	Northwestern Subcont	08/01/08 07/31/09	$144,262
	Synaptic Transmission in the Basal Ganglia	NIH	04/01/09 03/31/10	$175,000
LeDoux, M.	Mutant Gene Ident in the Dystonic Rat	NIH	02/01/08 01/31/10	$192,759
	Boehringer Ingelheim	Clinical Trial	02/13/09 08/13/10	$28,058
	Univ South Florida	Subcontract	03/25/09 11/30/10	$13,935
	Univ Rochester-NeuroSearch	Contract	08/15/08 03/31/10	$83,751
	Univ Rochester SubAmarin	Contract	04/01/05 07/31/08	$48,228
	Univ Rochester HP Therap	Clinical Trial	07/01/05 06/30/09	$91,400
	Xenoport-XP053	Clinical Trial	09/01/06 08/09/09	$190,862
	Xenoport-XP055	Clinical Trial	01/10/07 10/31/08	$101,800
	Wolfe Neuropathy Grant	Grant	12/29/06 12/31/08	$100,000
	INC MERZ 60201-0433	Clinical Trial	02/09/07 02/05/12	$79,690
	INC MERZ 60201-0408	Clinical Trial	02/09/07 02/05/12	$89,250
	Dystonia Medical Res	Grant	04/15/08 04/04/09	$40,000
	Mass Gen Hospital	Contract	12/01/07 11/30/08	$170,000

Leffler, C.	Control of neonatal circulation	NIH	04/01/11 03/31/12	$250,000
	Carbon monoxide in newborn cerebral circulation	NIH	08/16/11 07/31/10	$237,045
Levin, M.	Comm Fdn MS Res	Grant	08/31/06 08/30/10	$300,000
Lu, L.	Genetic Analysis of ethanol-Mediated Stress Reduction	NIH	06/01/08 05/31/10	$313,138
Malik, K.	Ecosanoids-Induced Vascular Growth During Injury	NIH	01/01/09 12/31/09	$237,045
	Angiotensins, Prostaglandins-Adrenergic Interactions	NIH	04/01/09 03/31/10	$427,832
Matta, S.	Gestational Drug and Nictotine Self-Administration	NIH	04/01/07 03/31/10	$213,340
McDonald, M.	Michael J. Fox Fdn	Grant	10/31/07 10/30/08	$75,000
	Am Health Asst Fdn	Grant	04/01/07 03/31/09	$73,764
	Am Health Asst Fdn	Grant	04/01/08 03/31/09	$75,000
	USPHS Grant NS-065063-01	NIH	02/15/09 01/31/10	$322,474
Miller, D.	Treatment with KZ-41 and OTP Promotes Wound Healing in A Radiation Combined Injury	NIH	08/01/08 07/31/10	$114,602
	Discovery of Novel Cytotoxic Agents for Advanced Melanoma	NIH	03/05/08 02/28/10	$150,000
	Targeted Delivery of TFOs for Treatment of Liver Fibrosis	NIH	03/01/07 12/31/10	$157,500
	Novel Biosynthetic Pathway for Secosteroids and the Skin	NIH	07/01/06 06/30/11	$293,459
	Ligand Recognition by Phospholipid Growth Factor Receptors	NIH/NCI	08/01/06 07/31/11	$231,723
Nelson, R.	Modulation of Primate Somatosensory Cortical Responses	NIH	04/01/09 03/31/10	$196,875

O'Connell, K	Cell Biology of Cardiac Kv Channels	NIH	02/17/09 01/31/12	$181,567
Parfenova, H.	Heme oxygenase and cerebral vascular injury	NIH	04/01/08 03/31/10	$15,607
Pfeiffer, R.	Univ Rochester NS37167	Contract	09/01/99 11/30/09	$26,200
	Univ Rochester NS050095	Contract	09/01/05 12/31/08	$31,200
	Univ Rochester NS0046487	Contract	05/01/06 04/30/09	$92,580
	Novartis Pharm ELC200	Clinical Trial	12/01/04 04/30/09	$110,108
	Boehringer Ingel 248-538	Clinical Trial	02/17/05 12/31/10	$490,900
	Boehringer Ingel 248-595	Clinical Trial	10/10/06 11/09/08	$107,469
	PharmaNet 6002US025	Clinical Trial	01/11/06 12/31/10	$62,738
	EISAI Quintiles E2007-303	Clinical Trial	07/26/07 09/30/09	$109,136
	EISAI Quintiles E2007-302	Clinical Trial	12/01/06 12/31/08	$103,062
	Schwarz Biosciences	Clinical Trial	10/18/07 12/31/10	$130,710
	I3 Res-Ingenix Pharm	Clincial Trial	03/18/08 12/31/10	$171,373
Pourcyrous, M.	Yale University Subcoon.		06/01/08 05/31/09	$7,259
Reiner, A.	Neural Control of Choroidal Blood Flow in the Eye	NIH	12/01/06 11/30/09	$747,241
	Behavioral and Histological Assessment in R/2 mice of the Efficacy of the Group 2 Metabotropic Glutamate Receptor agonist LY379268 for treating Huntington's Disease	High Q Fdn Agmt-Reiner	06/30/08 03/31/09	$225,000
	Role of Striatal Parvalbuminergic Neurons in Dystonia in Huntington's Disease	Hereditary Disease Fdn Gr-Reiner	06/01/07 05/31/10	$50,000
	Neuropathology and pathogenesis of Huntington's Disease	NIH	09/01/08 08/31/09	$218,750

	Organization of the Cortical Projection to the Basal Ganglia	NIH	03/01/09 02/28/10	$218,750
Reiter, L.	Cure Autism Now	Grant	02/11/07 08/10/08	$60,000
	Autism Speaks	Grant	12/15/07 12/15/08	$60,000
	USPHS Grant NS-059902-01	NIH	09/01/08 08/31/09	$313,338
	Angelman Syndrome	Grant	12/01/08 11/30/09	$77,866
Rex, T.	Analysis of EPO Processing in Mouse Tissue – Implicatons for Gene Therapy of Retinal Degeneration	Roche Fdn	07/01/07 06/30/10	$65,011
Senogles, S.	D2 dopamine receptor activation leads to anti-proliferation in a small cell lung cancer cell model	Philip Morris	06/01/07 05/31/10	$80,523
Sharp, B.	Opiate Receptor-Mediated Effects of Stress on Immunity	NIH	07/01/08 06/30/10	$287,047
	Interaction Between Nicotine and Stress	NIH	01/01/09 12/31/09	$292,787
Steinle, J.	Effects of Loss of Sympathetic Nerve Activity in Ocular Aging	NIH/NIA	01/01/07 08/31/09	$92,586
	Role of Beta-Adrenergic Receptor Agonists in Therapies for Retinopathy	Juvenile Diabetes Research Foundation	01/01/06 12/31/11	$158,502
	Pre-Clinical Testing of Isopropereal Eye Drops for NPDR Fdn	JDRF	09/01/08 08/31/10	$181,248
	Greve Special Scholar Award	Research to Prevent Blindness	07/01/08 06/30/09	$60,000
Steketee, J.	Cortical Mechanisms of Cocaine Sensitization	NIH	06/01/09 05/31/10	$200,000
Tavalin, S.	Regulation of Ionotropic Glutamate Receptors	NIH	06/01/08 05/31/10	$153,487
Teruyama, R.	Epithelial Sodium Channels in the Supraoptic Vasopressin and Oxytocin Neurons	NIH	08/01/08 07/31/09	$150,000

Timmons, S.	Traumatic Brain Injury	NIH	07/01/07 06/30/09	$365,990
	Univ Pittsburg Subcont	Contract	05/15/07 04/30/09	$66,000
	VCU Subcont –Solvay	Clinical Trial	06/30/08 12/31/09	$29,800
Waters, R.	Fetal alcohol Exposure and Sensorimotor Cortex Function	NIH	08/01/06 10/31/09	$240,909
	Brainstem Gustatory Processing	NIH	07/01/07 06/30/10	$327,171
	mechanisms of large-scale reorganization in rat forepaw barrel subfield cortex	NIH	05/01/09 04/30/10	$175,000
Watsky, M.	Development of an artificial innervated cornea for safety and efficacy testing	Univ. of Ottawa	05/01/07 06/30/10	$37,235
	Vitamin D in the Cornea and Anterior Segment of the Eye	NIH	01/01/09 12/31/10	$150,000
Wheless, J.	Pediatric Epilepsy Research Center		06/03/05 06/02/10	$190,000
	Children's Hospital Subcon. NS045911		11/01/05 10/31/08	$63,465
Williams, R.	Informatics Center for Mouse Neurogenetics	NIH	07/01/08 06/30/09	$818,610
	Center for Integrated and Translational Genomics	Genome Research (Managed by T. Mark-Major)	07/01/08 06/30/09	$1,000,000
	Systems Genetics of the HPA	NIH	07/20/08 06/30/09	$156,708
	Integrative genetics of cancer susceptibility	University of North Carolina Subcontract	05/13/08 03/31/09	$77,559
	Dispersion patterns for Retinal Neuroblasts	Univ Calif Subcont EY01087 (Santa Barbara)	09/01/07 08/31/08	$33,029
	N/A Mice Brain Micrcoarrays	CTR Reg Therapies Dresden Svcs Cont	12/01/08 11/30/09	$21,675

	INIA: Robust systems genetics of Alcohol and Stress	NIH	02/25/09 01/31/10	$244,373
	Dispersion patterns for Retinal Neuroblasts	Univ Calif Subcont EY01087 (Santa Barbara)	09/01/08 08/31/09	$32,521
	Mouse BIRN 442171760	Univ Calif Subcont RR021760 (UCLA)	05/01/09 04/30/10	$162,519
Yoo, T.J.	USPHS Grant DC-005010 No Cost Extension	NIH		$19161.26
Zhang, Y.H.	Elucidating the Neural substrate of taste analgesia	NIH	01/01/09 12/31/09	$47,471
Zhou, F.M.	Regulation of Basal Ganglia Output Neurons	NIH	09/01/08 08/31/09	$185,625
	Non-Transporter Cocaine Mechanisms in Dopamine System	NIH	07/01/08 06/30/09	$196,000
	An Ultra-Short Dopamine Pathway: Implications for Parkinson's Disease	American Parkinson Disease Assoc.	09/01/08 08/31/09	$50,000
			TOTAL	**$23,704,735**

APPENDIX 2

Faculty Publications and Society for Neuroscience Presentations

FY 2008-2009

1) Peer-reviewed publications for 2008-2009 (cited in PubMed):

(Abdeltawab, Aziz et al. 2008)
Abdeltawab, N. F., Aziz, R. K., Kansal, R., Rowe, S. L., Su, Y., Gardner, L., Brannen, C., Nooh, M. M., Attia, R. R., Abdelsamed, H. A., Taylor, W. L., **Lu, L.**, **Williams, R. W.** and Kotb, M. (2008). "An unbiased systems genetics approach to mapping genetic loci modulating susceptibility to severe streptococcal sepsis." PLoS Pathog **4**(4): e1000042.

Adebiyi, A., McNally, E. M. and **Jaggar, J. H.** (2008). "Sulfonylurea receptor-dependent and -independent pathways mediate vasodilation induced by ATP-sensitive K+ channel openers." Mol Pharmacol **74**(3): 736-43.

Ajioka, I. and **Dyer, M. A.** (2008). "A new model of tumor susceptibility following tumor suppressor gene inactivation." Cell Cycle **7**(6): 735-40.

Amlie-Lefond, C., Chan, A. K., Kirton, A., deVeber, G., **Hovinga, C. A.**, Ichord, R., Stephens, D. and Zaidat, O. O. (2009). "Thrombolysis in acute childhood stroke: design and challenges of the thrombolysis in pediatric stroke clinical trial." Neuroepidemiology **32**(4): 279-86.

Amlie-Lefond, C., deVeber, G., Chan, A. K., Benedict, S., Bernard, T., Carpenter, J., Dowling, M. M., Fullerton, H., **Hovinga, C.**, Kirton, A., Lo, W., Zamel, K. and Ichord, R. (2009). "Use of alteplase in childhood arterial ischaemic stroke: a multicentre, observational, cohort study." Lancet Neurol **8**(6): 530-6.

Arzimanoglou, A., French, J., Blume, W. T., Cross, J. H., Ernst, J. P., Feucht, M., Genton, P., Guerrini, R., Kluger, G., Pellock, J. M., Perucca, E. and **Wheless, J. W.** (2009). "Lennox-Gastaut syndrome: a consensus approach on diagnosis, assessment, management, and trial methodology." Lancet Neurol **8**(1): 82-93.

Asato, M. R., Manjunath, R., Sheth, R. D., Phelps, S. J., **Wheless, J. W.**, **Hovinga, C. A.**, Pina-Garza, J. E., Haskins, L. S. and Zingaro, W. M. (2009). "Adolescent and caregiver experiences with epilepsy." J Child Neurol **24**(5): 562-71.

Baquet, Z. C., Williams, D., Brody, J. and **Smeyne, R. J.** (2009). "A comparison of model-based (2D) and design-based (3D) stereological methods for estimating cell number in the substantia nigra pars compacta (SNpc) of the C57BL/6J mouse." Neuroscience **161**(4): 1082-90.

Bari, R., **Zhang, Y. H.**, Zhang, F., Wang, N. X., Stipp, C. S., Zheng, J. J. and Zhang, X. A. (2009). "Transmembrane interactions are needed for KAI1/CD82-mediated suppression of cancer invasion and metastasis." Am J Pathol **174**(2): 647-60.

Barker, K. S., Park, H., Phan, Q. T., Xu, L., **Homayouni, R.**, Rogers, P. D. and Filler, S. G. (2008). "Transcriptome profile of the vascular endothelial cell response to Candida albicans." J Infect Dis **198**(2): 193-202.

Basuroy, S., Bhattacharya, S., **Leffler, C. W.** and **Parfenova, H.** (2009). "Nox4 NADPH oxidase mediates oxidative stress and apoptosis caused by TNF-alpha in cerebral vascular endothelial cells." Am J Physiol Cell Physiol **296**(3): C422-32.

Bennicelli, J., Wright, J. F., Komaromy, A., Jacobs, J. B., Hauck, B., Zelenaia, O., Mingozzi, F., Hui, D., Chung, D., **Rex, T. S.**, Wei, Z., Qu, G., Zhou, S., Zeiss, C., Arruda, V. R., Acland, G. M., Dell'Osso, L. F., High, K. A., Maguire, A. M. and Bennett, J. (2008). "Reversal of blindness in animal models of leber congenital amaurosis using optimized AAV2-mediated gene transfer." Mol Ther **16**(3): 458-65.

Beranova-Giorgianni, S., **Desiderio, D. M.** and Giorgianni, F. (2009). "Phosphoproteome analysis by in-gel isoelectric focusing and tandem mass spectrometry." Methods Mol Biol **519**: 383-96.

Berry, R. B., Werner, D. F., Wang, X., **Jablonski, M. M.**, Homanics, G. E., **Mittleman, G.** and Matthews, D. B. (2008). "Mice with targeted genetic reduction of GABA(A) receptor alpha1

subunits display performance differences in Morris water maze tasks." Neurobiol Learn Mem **90**(3): 580-3.

Bhattacharya, S., Ray, R. M. and Johnson, L. R. (2009). "Role of polyamines in p53-dependent apoptosis of intestinal epithelial cells." Cell Signal **21**(4): 509-22.

Bloomer, R. J., Schilling, B. K., Karlage, R. E., **LeDoux, M. S.**, **Pfeiffer, R. F.** and Callegari, J. (2008). "Effect of resistance training on blood oxidative stress in Parkinson disease." Med Sci Sports Exerc **40**(8): 1385-9.

Blundon, J. A. and **Zakharenko, S. S.** (2008). "Dissecting the components of long-term potentiation." Neuroscientist **14**(6): 598-608.

Boop, F. A. (2008). "Cumulative diagnostic radiation exposure in children with ventriculoperitoneal shunts." Childs Nerv Syst **24**(4): 499.

Boop, F. A. (2009). "Stereotactic radiosurgery for primitive neuroectodermal tumors." J Neurosurg Pediatr **3**(3): 203; discussion 204.

Brannon Morris, E., Li, C., Khan, R. B., Sanford, R. A., **Boop, F.**, Pinlac, R., Xiong, X. and Merchant, T. E. (2009). "Evolution of neurological impairment in pediatric infratentorial ependymoma patients." J Neurooncol.

Brown, R. O., Morgan, L. M., **Bhattacharya, S. K.**, Johnson, P. L., Minard, G. and Dickerson, R. N. (2008). "Potential aluminum exposure from parenteral nutrition in patients with acute kidney injury." Ann Pharmacother **42**(10): 1410-5.

Bryant, J. L., Roy, S. and **Heck, D.** H. (2009). "A technique for stereotaxic recordings of neuronal activity in awake, head-restrained mice." J Neurosci Methods **178**(1): 75-9.

Bukiya, A. N., McMillan, J., Parrill, A. L. and **Dopico, A. M.** (2008). "Structural determinants of monohydroxylated bile acids to activate beta 1 subunit-containing BK channels." J Lipid Res **49**(11): 2441-51.

Bukiya, A. N., Vaithianathan, T., Toro, L. and **Dopico, A. M.** (2008). "The second transmembrane domain of the large conductance, voltage- and calcium-gated potassium channel beta(1) subunit is a lithocholate sensor." FEBS Lett **582**(5): 673-8.

Cai, Q., Du, X., Zhou, B., Cai, C., Kermany, M. H. and **Yoo, T.** (2009). "Induction of Tolerance by Oral Administration of Beta-Tubulin in an Animal Model of Autoimmune Inner Ear Disease." ORL J Otorhinolaryngol Relat Spec **71**(3): 135-141.

Canale, D. J., Watridge, C. B., Fuehrer, T. S. and **Robertson, J. H.** (2009). "The history of neurosurgery in Memphis: the Semmes-Murphey Clinic and the Department of Neurosurgery at the University of Tennessee College of Medicine." J Neurosurg.

Carbone, L. D., Rosenberg, E. W., Tolley, E. A., Holick, M. F., Hughes, T. A., **Watsky, M. A.**, Barrow, K. D., Chen, T. C., Wilkin, N. K., **Bhattacharya, S. K.**, Dowdy, J. C., Sayre, R. M. and Weber, K. T. (2008). "25-Hydroxyvitamin D, cholesterol, and ultraviolet irradiation." Metabolism **57**(6): 741-8.

Carneiro, A. M., Airey, D. C., Thompson, B., Zhu, C. B., **Lu, L.**, **Chesler, E. J.**, Erikson, K. M. and Blakely, R. D. (2009). "Functional coding variation in recombinant inbred mouse lines reveals multiple serotonin transporter-associated phenotypes." Proc Natl Acad Sci U S A **106**(6): 2047-52.

Chaum, E., Karnowski, T. P., Govindasamy, V. P., Abdelrahman, M. and Tobin, K. W. (2008). "Automated diagnosis of retinopathy by content-based image retrieval." Retina **28**(10): 1463-77.

Chen, H., Fu, Y. and **Sharp, B. M.** (2008). "Chronic nicotine self-administration augments hypothalamic-pituitary-adrenal responses to mild acute stress." Neuropsychopharmacology **33**(4): 721-30.

Chen, J., Wang, Z., Lu, Y., Dalton, J. T., **Miller, D. D.** and Li, W. (2008). "Synthesis and antiproliferative activity of imidazole and imidazoline analogs for melanoma." Bioorg Med Chem Lett **18**(11): 3183-7.

Chen, P. C., Vargas, M. R., Pani, A. K., **Smeyne, R. J.**, **Johnson, D. A.**, Kan, Y. W. and Johnson, J. A. (2009). "Nrf2-mediated neuroprotection in the MPTP mouse model of Parkinson's disease: Critical role for the astrocyte." Proc Natl Acad Sci U S A **106**(8): 2933-8.

Cheng, X., Pachuau, J., Blaskova, E., Asuncion-Chin, M., Liu, J., **Dopico, A. M.** and **Jaggar, J. H.** (2009). "Alternative splicing of CaV1.2 channel exons in smooth muscle cells of resistance-size arteries generates currents with unique electrophysiological properties." Am J Physiol Heart Circ Physiol.

Chesler, E. J., **Miller, D.** R., Branstetter, L. R., Galloway, L. D., Jackson, B. L., Philip, V. M., Voy, B. H., Culiat, C. T., Threadgill, D. W., **Williams, R. W.**, Churchill, G. A., Johnson, D. K. and Manly, K. F. (2008). "The Collaborative Cross at Oak Ridge National Laboratory: developing a powerful resource for systems genetics." Mamm Genome **19**(6): 382-9.

Chintagumpala, M., Hassall, T., Palmer, S., Ashley, D., Wallace, D., Kasow, K., Merchant, T. E., Krasin, M. J., Dauser, R., **Boop, F.**, Krance, R., Woo, S., Cheuk, R., Lau, C., Gilbertson, R. and Gajjar, A. (2009). "A pilot study of risk-adapted radiotherapy and chemotherapy in patients with supratentorial PNET." Neuro Oncol **11**(1): 33-40.

Cicero, S. A., Johnson, D., Reyntjens, S., Frase, S., Connell, S., Chow, L. M., Baker, S. J., Sorrentino, B. P. and **Dyer, M. A.** (2009). "Cells previously identified as retinal stem cells are pigmented ciliary epithelial cells." Proc Natl Acad Sci U S A **106**(16): 6685-90.

Clarke, D. F., **Boop, F. A.**, **McGregor, A. L.**, **Perkins, F. F., Jr.**, Brewer, V. R. and **Wheless, J. W.** (2008). "Pediatric extratemporal epilepsy presenting with a complex auditory aura." Epileptic Disord **10**(2): 181-6.

Daley, M. L., Narayanan, N., **Leffler, C. W.** and Eide, P. K. (2008). "Stroke with subarachnoid hemorrhage: assessment of cerebrovascular pressure regulation and simulated cerebrovascular resistance." Acta Neurochir Suppl **102**: 321-5.

Danquah, M., Li, F., Duke, C. B., 3rd, **Miller, D. D.** and Mahato, R. I. (2009). "Micellar Delivery of Bicalutamide and Embelin for Treating Prostate Cancer." Pharm Res.

DeCuypere, M., Kalabokis, V. N., Hao, R., Schroeder, D., **Miller, D. D.** and **LeDoux, M. S.** (2008). "Localization of N-methyl-norsalsolinol within rodent and human brain." J Neurosci Res **86**(11): 2543-52.

DeCuypere, M., Lu, Y., **Miller, D. D.** and **LeDoux, M. S.** (2008). "Regional distribution of tetrahydroisoquinoline derivatives in rodent, human, and Parkinson's disease brain." J Neurochem **107**(5): 1398-413.

Desmots, F., Russell, H. R., Michel, D. and **McKinnon, P. J.** (2008). "Scythe regulates apoptosis-inducing factor stability during endoplasmic reticulum stress-induced apoptosis." J Biol Chem **283**(6): 3264-71.

Dewire, M. D., Ellison, D. W., Patay, Z., **McKinnon, P. J.**, Sanders, R. P. and Gajjar, A. (2009). "Fanconi anemia and biallelic BRCA2 mutation diagnosed in a young child with an embryonal CNS tumor." Pediatr Blood Cancer.

Dietrich, P., Shanmugasundaram, R., Shuyu, E. and **Dragatsis, I.** (2009). "Congenital hydrocephalus associated with abnormal subcommissural organ in mice lacking huntingtin in Wnt1 cell lineages." Hum Mol Genet **18**(1): 142-50.

Dijkstra, S., Kooij, G., Verbeek, R., van der Pol, S. M., Amor, S., **Geisert, E. E.**, Jr., Dijkstra, C. D., van Noort, J. M. and Vries, H. E. (2008). "Targeting the tetraspanin CD81 blocks monocyte transmigration and ameliorates EAE." Neurobiol Dis **31**(3): 413-21.

Dishmon, D. A., Dotson, J. L., Munir, A., Nelson, M. D., **Bhattacharya, S. K.**, IA, D. C., Davis, R. C. and Weber, K. T. (2009). "Hypovitaminosis D and valvular calcification in patients with dilated cardiomyopathy." Am J Med Sci **337**(5): 312-6.

Dopico, A. M. and Lovinger, D. M. (2009). "Acute alcohol action and desensitization of ligand-gated ion channels." Pharmacol Rev **61**(1): 98-114.

Doronkin, S. and **Reiter, L. T.** (2008). "Drosophila orthologues to human disease genes: an update on progress." Prog Nucleic Acid Res Mol Biol **82**: 1-32.

Dragatsis, I., Goldowitz, D., Del Mar, N., Deng, Y. P., Meade, C. A., Liu, L., Sun, Z., Dietrich, P., Yue, J. and **Reiner, A.** (2009). "CAG repeat lengths > or =335 attenuate the phenotype in the R6/2 Huntington's disease transgenic mouse." Neurobiol Dis **33**(3): 315-30.

Dunkel, N., Liu, T. T., Barker, K. S., **Homayouni, R.**, Morschhauser, J. and Rogers, P. D. (2008). "A gain-of-function mutation in the transcription factor Upc2p causes upregulation of ergosterol biosynthesis genes and increased fluconazole resistance in a clinical Candida albicans isolate." Eukaryot Cell **7**(7): 1180-90.

Dyer, M. A., Martins, R., da Silva Filho, M., Muniz, J. A., Silveira, L. C., Cepko, C. L. and Finlay, B. L. (2009). "Developmental sources of conservation and variation in the evolution of the primate eye." Proc Natl Acad Sci U S A **106**(22): 8963-8.

Elias, B. C., Suzuki, T., Seth, A., Giorgianni, F., Kale, G., Shen, L., Turner, J. R., Naren, A., **Desiderio, D. M.** and Rao, R. (2009). "Phosphorylation of Tyr-398 and Tyr-402 in occludin prevents its interaction with ZO-1 and destabilizes its assembly at the tight junctions." J Biol Chem **284**(3): 1559-69.

Evans, C. O., Moreno, C. S., Zhan, X., McCabe, M. T., Vertino, P. M., **Desiderio, D. M.** and Oyesiku, N. M. (2008). "Molecular pathogenesis of human prolactinomas identified by gene expression profiling, RT-qPCR, and proteomic analyses." Pituitary **11**(3): 231-45.

Fain, J. N., Buehrer, B., **Bahouth, S. W.**, Tichansky, D. S. and Madan, A. K. (2008). "Comparison of messenger RNA distribution for 60 proteins in fat cells vs the nonfat cells of human omental adipose tissue." Metabolism **57**(7): 1005-15.

Fain, J. N., Sacks, H. S., Buehrer, B., **Bahouth, S. W.**, Garrett, E., Wolf, R. Y., Carter, R. A., Tichansky, D. S. and Madan, A. K. (2008). "Identification of omentin mRNA in human epicardial adipose tissue: comparison to omentin in subcutaneous, internal mammary artery periadventitial and visceral abdominal depots." Int J Obes (Lond) **32**(5): 810-5.

Foehring, R. C. (2008). "Who needs A current? Functional remodelling in the Kv4.2-/- mouse." J Physiol **586**(6): 1461.

Frappart, P. O., Lee, Y., Russell, H. R., Chalhoub, N., Wang, Y. D., Orii, K. E., Zhao, J., Kondo, N., Baker, S. J. and **McKinnon, P. J.** (2009). "Recurrent genomic alterations characterize medulloblastoma arising from DNA double-strand break repair deficiency." Proc Natl Acad Sci U S A **106**(6): 1880-5.

Frappart, P. O. and **McKinnon, P. J.** (2008). "Mouse models of DNA double-strand break repair and neurological disease." DNA Repair (Amst) **7**(7): 1051-60.

Fraser, M. M., Bayazitov, I. T., **Zakharenko, S. S.** and Baker, S. J. (2008). "Phosphatase and tensin homolog, deleted on chromosome 10 deficiency in brain causes defects in synaptic structure, transmission and plasticity, and myelination abnormalities." Neuroscience **151**(2): 476-88.

Fulton, S. P., **Clarke, D. F.**, **Wheless, J. W.**, Ellison, D. W., Ogg, R. and **Boop, F. A.** (2009). "Angiocentric Glioma-Induced Seizures in a 2-Year-Old Child." J Child Neurol.

Gandhi, M. S., Deshmukh, P. A., Kamalov, G., Zhao, T., Zhao, W., Whaley, J. T., Tichy, J. R., **Bhattacharya, S. K.**, Ahokas, R. A., Sun, Y., Gerling, I. C. and Weber, K. T. (2008). "Causes and consequences of zinc dyshomeostasis in rats with chronic aldosteronism." J Cardiovasc Pharmacol **52**(3): 245-52.

Geng, X. and **Oliver, G.** (2009). "Pathogenesis of holoprosencephaly." J Clin Invest **119**(6): 1403-13.

Geng, X., Speirs, C., Lagutin, O., Inbal, A., Liu, W., Solnica-Krezel, L., Jeong, Y., Epstein, D. J. and **Oliver, G.** (2008). "Haploinsufficiency of Six3 fails to activate Sonic hedgehog expression in the ventral forebrain and causes holoprosencephaly." Dev Cell **15**(2): 236-47.

Giancardo, L., Abramoff, M. D., **Chaum, E.**, Karnowski, T. P., Meriaudeau, F. and Tobin, K. W. (2008). "Elliptical local vessel density: a fast and robust quality metric for retinal images." Conf Proc IEEE Eng Med Biol Soc **2008**: 3534-7.

Glatt, A. R., Denton, K. and **Boughter, J. D., Jr.** (2009). "Variation in nicotine consumption in inbred mice is not linked to orosensory ability." Chem Senses **34**(1): 27-35.

Goldberg, J. A., Teagarden, M. A., **Foehring, R. C.** and Wilson, C. J. (2009). "Nonequilibrium calcium dynamics regulate the autonomous firing pattern of rat striatal cholinergic interneurons." J Neurosci **29**(26): 8396-407.

Green, D. R. and **McKinnon, P. J.** (2008). "A survivor hits the breaks." Mol Cell **29**(4): 411-2.

Harden, C. L., Hopp, J., Ting, T. Y., Pennell, P. B., French, J. A., Allen Hauser, W., Wiebe, S., Gronseth, G. S., Thurman, D., Meador, K. J., Koppel, B. S., Kaplan, P. W., Robinson, J. N., Gidal, B., **Hovinga, C. A.**, Wilner, A. N., Vazquez, B., Holmes, L., Krumholz, A., Finnell, R. and Le Guen, C. (2009). "Management issues for women with epilepsy-Focus on pregnancy (an evidence-based review): I. Obstetrical complications and change in seizure frequency: Report of the Quality Standards Subcommittee and Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology and the American Epilepsy Society." Epilepsia **50**(5): 1229-36.

Harden, C. L., Hopp, J., Ting, T. Y., Pennell, P. B., French, J. A., Hauser, W. A., Wiebe, S., Gronseth, G. S., Thurman, D., Meador, K. J., Koppel, B. S., Kaplan, P. W., Robinson, J. N., Gidal, B., **Hovinga, C. A.**, Wilner, A. N., Vazquez, B., Holmes, L., Krumholz, A., Finnell, R. and Le Guen, C. (2009). "Practice Parameter update: Management issues for women with epilepsy--focus on pregnancy (an evidence-based review): Obstetrical complications and change in seizure frequency. Report of the Quality Standards Subcommittee and Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology and American Epilepsy Society." Neurology.

Harden, C. L., Meador, K. J., Pennell, P. B., Hauser, W. A., Gronseth, G. S., French, J. A., Wiebe, S., Thurman, D., Koppel, B. S., Kaplan, P. W., Robinson, J. N., Hopp, J., Ting, T. Y., Gidal, B., **Hovinga, C. A.**, Wilner, A. N., Vazquez, B., Holmes, L., Krumholz, A., Finnell, R., Hirtz, D. and Le Guen, C. (2009). "Management issues for women with epilepsy-Focus on pregnancy (an evidence-based review): II. Teratogenesis and perinatal outcomes: Report of the Quality Standards Subcommittee and Therapeutics and Technology Subcommittee of the American Academy of Neurology and the American Epilepsy Society." Epilepsia **50**(5): 1237-46.

Harden, C. L., Meador, K. J., Pennell, P. B., Hauser, W. A., Gronseth, G. S., French, J. A., Wiebe, S., Thurman, D., Koppel, B. S., Kaplan, P. W., Robinson, J. N., Hopp, J., Ting, T. Y., Gidal, B., **Hovinga, C. A.**, Wilner, A. N., Vazquez, B., Holmes, L., Krumholz, A., Finnell, R., Hirtz, D. and Le Guen, C. (2009). "Practice Parameter update: Management issues for women with epilepsy--focus on pregnancy (an evidence-based review): Teratogenesis and perinatal outcomes. Report of the Quality Standards Subcommittee and Therapeutics and Technology Subcommittee of the American Academy of Neurology and American Epilepsy Society." Neurology.

Harden, C. L., Pennell, P. B., Koppel, B. S., **Hovinga, C. A.**, Gidal, B., Meador, K. J., Hopp, J., Ting, T. Y., Hauser, W. A., Thurman, D., Kaplan, P. W., Robinson, J. N., French, J. A., Wiebe, S., Wilner, A. N., Vazquez, B., Holmes, L., Krumholz, A., Finnell, R., Shafer, P. O. and Le Guen, C. (2009). "Practice Parameter update: Management issues for women with epilepsy--focus on

pregnancy (an evidence-based review): Vitamin K, folic acid, blood levels, and breastfeeding. Report of the Quality Standards Subcommittee and Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology and American Epilepsy Society." Neurology.

Harden, C. L., Pennell, P. B., Koppel, B. S., **Hovinga, C. A.**, Gidal, B., Meador, K. J., Hopp, J., Ting, T. Y., Hauser, W. A., Thurman, D., Kaplan, P. W., Robinson, J. N., French, J. A., Wiebe, S., Wilner, A. N., Vazquez, B., Holmes, L., Krumholz, A., Finnell, R., Shafer, P. O. and Le Guen, C. L. (2009). "Management issues for women with epilepsy--focus on pregnancy (an evidence-based review): III. Vitamin K, folic acid, blood levels, and breast-feeding: Report of the Quality Standards Subcommittee and Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology and the American Epilepsy Society." Epilepsia **50**(5): 1247-55.

Hashimoto, K. and **Kita, H.** (2008). "Serotonin activates presynaptic and postsynaptic receptors in rat globus pallidus." J Neurophysiol **99**(4): 1723-32.

Hashimoto, M., Zhao, L. and **Nowak, T. S.**, Jr. (2008). "Temporal thresholds for infarction and hypothermic protection in Long-Evans rats: factors affecting apparent 'reperfusion injury' after transient focal ischemia." Stroke **39**(2): 421-6.

Heck, D. H., Roy, S., Xie, N. and **Waters, R. S.** (2008). "Prenatal alcohol exposure delays acquisition and use of skilled reaching movements in juvenile rats." Physiol Behav **94**(4): 540-4.

Heck, D. H., Zhao, Y., Roy, S., **LeDoux, M. S.** and **Reiter, L. T.** (2008). "Analysis of cerebellar function in Ube3a-deficient mice reveals novel genotype-specific behaviors." Hum Mol Genet **17**(14): 2181-9.

Heinrich, K. E., Berry, M. W. and **Homayouni, R.** (2008). "Gene tree labeling using nonnegative matrix factorization on biomedical literature." Comput Intell Neurosci: 276535.

Helton, K. J., Weeks, J. K., Phillips, N. S., Zou, P., Kun, L. E., Khan, R. B., Gajjar, A., Fouladi, M., Broniscer, A., **Boop, F.**, Li, C. S. and Ogg, R. J. (2008). "Diffusion tensor imaging of brainstem tumors: axonal degeneration of motor and sensory tracts." J Neurosurg Pediatr **1**(4): 270-6.

Holst, J., Wang, H., Eder, K. D., Workman, C. J., Boyd, K. L., Baquet, Z., Singh, H., Forbes, K., Chruscinski, A., **Smeyne, R.**, van Oers, N. S., Utz, P. J. and Vignali, D. A. (2008). "Scalable signaling mediated by T cell antigen receptor-CD3 ITAMs ensures effective negative selection and prevents autoimmunity." Nat Immunol **9**(6): 658-66.

Hovinga, C. A., Asato, M. R., Manjunath, R., **Wheless, J. W.**, Phelps, S. J., Sheth, R. D., Pina-Garza, J. E., Zingaro, W. M. and Haskins, L. S. (2008). "Association of non-adherence to antiepileptic drugs and seizures, quality of life, and productivity: survey of patients with epilepsy and physicians." Epilepsy Behav **13**(2): 316-22.

Hovinga, C. A. and Pennell, P. B. (2008). "Antiepileptic drug therapy in pregnancy II: fetal and neonatal exposure." Int Rev Neurobiol **83**: 241-58.

Iannaccone, A., Fung, K. H., Eyestone, M. E. and Stone, E. M. (2009). "Treatment of adult-onset acute macular retinoschisis in enhanced s-cone syndrome with oral acetazolamide." Am J Ophthalmol **147**(2): 307-312 e2.

Iannaccone, A., Othman, M. I., **Cantrell, A.** D., Jennings, B. J., Branham, K. and Swaroop, A. (2008). "Retinal phenotype of an X-linked pseudo-Usher syndrome in association with the G173R mutation in the RPGR gene." Adv Exp Med Biol **613**: 221-7.

Jan, T. A., **Lu, L.**, **Li, C. X.**, **Williams, R. W.** and **Waters, R. S.** (2008). "Genetic analysis of posterior medial barrel subfield (PMBSF) size in somatosensory cortex (SI) in recombinant inbred strains of mice." BMC Neurosci **9**: 3.

Jang, H., Boltz, D. A., Webster, R. G. and **Smeyne, R. J.** (2009). "Viral parkinsonism." Biochim Biophys Acta **1792**(7): 714-21.

Johnson, N. C., Dillard, M. E., Baluk, P., McDonald, D. M., Harvey, N. L., Frase, S. L. and **Oliver, G.** (2008). "Lymphatic endothelial cell identity is reversible and its maintenance requires Prox1 activity." Genes Dev **22**(23): 3282-91.

Kamalov, G., Deshmukh, P. A., Baburyan, N. Y., Gandhi, M. S., Johnson, P. L., Ahokas, R. A., **Bhattacharya, S. K.**, Sun, Y., Gerling, I. C. and Weber, K. T. (2009). "Coupled calcium and zinc dyshomeostasis and oxidative stress in cardiac myocytes and mitochondria of rats with chronic aldosteronism." J Cardiovasc Pharmacol **53**(5): 414-23.

Kang, G. S., Wang, X. D., Mohler, M. L., Kirichenko, O. V., Patil, R., Orr, W. E., **Miller, D. D.** and **Geisert, E. E.** (2008). "Effects, in an in-vivo model system, of 1,2,3,4-tetrahydroisoquinoline on glioma." Anticancer Drugs **19**(9): 859-70.

Kanu, A. and **Leffler, C. W.** (2009). "Roles of glia limitans astrocytes and carbon monoxide in adenosine diphosphate-induced pial arteriolar dilation in newborn pigs." Stroke **40**(3): 930-5.

Karnowski, T. P., Govindasamy, V., Tobin, K. W., **Chaum, E.** and Abramoff, M. D. (2008). "Retina lesion and microaneurysm segmentation using morphological reconstruction methods with ground-truth data." Conf Proc IEEE Eng Med Biol Soc **2008**: 5433-6.

Katyal, S. and **McKinnon, P. J.** (2008). "DNA strand breaks, neurodegeneration and aging in the brain." Mech Ageing Dev **129**(7-8): 483-91.

Kossoff, E. H., Zupec-Kania, B. A., Amark, P. E., Ballaban-Gil, K. R., Christina Bergqvist, A. G., Blackford, R., Buchhalter, J. R., Caraballo, R. H., Helen Cross, J., Dahlin, M. G., Donner, E. J., Klepper, J., Jehle, R. S., Kim, H. D., Christiana Liu, Y. M., Nation, J., Nordli, D. R., Jr., Pfeifer, H. H., Rho, J. M., Stafstrom, C. E., Thiele, E. A., Turner, Z., Wirrell, E. C., **Wheless, J. W.**, Veggiotti, P. and Vining, E. P. (2009). "Optimal clinical management of children receiving the ketogenic diet: recommendations of the International Ketogenic Diet Study Group." Epilepsia **50**(2): 304-17.

Krishnamurthy, P., Schwab, M., Takenaka, K., Nachagari, D., **Morgan, J.**, Leslie, M., Du, W., Boyd, K., Cheok, M., Nakauchi, H., Marzolini, C., Kim, R. B., Poonkuzhali, B., Schuetz, E., Evans, W., Relling, M. and Schuetz, J. D. (2008). "Transporter-mediated protection against thiopurine-induced hematopoietic toxicity." Cancer Res **68**(13): 4983-9.

Lavado, A., Lagutin, O. V. and **Oliver, G.** (2008). "Six3 inactivation causes progressive caudalization and aberrant patterning of the mammalian diencephalon." Development **135**(3): 441-50.

Lavrentyev, E. N. and **Malik, K. U.** (2009). "High glucose-induced Nox1-derived superoxides downregulate PKC-betaII, which subsequently decreases ACE2 expression and ANG(1-7) formation in rat VSMCs." Am J Physiol Heart Circ Physiol **296**(1): H106-18.

Ledet, D. S., **Wheless, J. W.**, Rubnitz, J. E. and Brannon Morris, E. (2009). "Levetiracetam as monotherapy for seizures in a neonate with acute lymphoblastic leukemia." Eur J Paediatr Neurol.

LeDoux, M. S. (2009). "Meige syndrome: What's in a name?" Parkinsonism Relat Disord.

Lee, S. and **Levin, M. C.** (2008). "Molecular mimicry in neurological disease: what is the evidence?" Cell Mol Life Sci **65**(7-8): 1161-75.

Lee, S., Shin, Y., Marler, J. and **Levin, M. C.** (2008). "Post-translational glycosylation of target proteins implicate molecular mimicry in the pathogenesis of HTLV-1 associated neurological disease." J Neuroimmunol **204**(1-2): 140-8.

Li, A., Xi, Q., Umstot, E. S., Bellner, L., Schwartzman, M. L., **Jaggar, J. H.** and **Leffler, C. W.** (2008). "Astrocyte-derived CO is a diffusible messenger that mediates glutamate-induced cerebral arteriolar dilation by activating smooth muscle Cell KCa channels." Circ Res **102**(2): 234-41.

Li, S., Dou, W., Tang, Y., Goorha, S., Ballou, L. R. and **Blatteis, C. M.** (2008). "Acetaminophen: antipyretic or hypothermic in mice? In either case, PGHS-1b (COX-3) is irrelevant." Prostaglandins Other Lipid Mediat **85**(3-4): 89-99.

Li, W., Hwang, D. J., Cremer, D., Joo, H., Kraka, E., Kim, J., Ross, C. R., 2nd, Nguyen, V. Q., Dalton, J. T. and **Miller, D. D.** (2009). "Structure determination of chiral sulfoxide in diastereomeric bicalutamide derivatives." Chirality **21**(6): 578-83.

Liu, J., Vaithianathan, T., Manivannan, K., Parrill, A. and **Dopico, A. M.** (2008). "Ethanol modulates BKCa channels by acting as an adjuvant of calcium." Mol Pharmacol **74**(3): 628-40.

Liu, Y., Denton, J. M. and **Nelson, R. J.** (2008). "Monkey primary somatosensory cortical activity during the early reaction time period differs with cues that guide movements." Exp Brain Res **187**(3): 349-58.

Liu, Z. and **Zuo, J.** (2008). "Cell cycle regulation in hair cell development and regeneration in the mouse cochlea." Cell Cycle **7**(14): 2129-33.

Livy, D. J. and **Elberger, A. J.** (2008). "Alcohol exposure during the first two trimesters-equivalent alters the development of corpus callosum projection neurons in the rat." Alcohol **42**(4): 285-93.

Lu, L., Chen, S. S., Hassid, A. and Sun, Y. (2008). "Cardiac fibrogenesis following infarction in mice with deletion of inducible nitric oxide synthase." Am J Med Sci **335**(6): 431-8.

Lu, L., Wei, L., Peirce, J. L., Wang, X., Zhou, J., **Homayouni, R.**, **Williams, R. W.** and Airey, D. C. (2008). "Using gene expression databases for classical trait QTL candidate gene discovery in the BXD recombinant inbred genetic reference population: mouse forebrain weight." BMC Genomics **9**: 444.

Lu, Y., Li, C. M., Wang, Z., Ross, C. R., 2nd, Chen, J., Dalton, J. T., Li, W. and **Miller, D. D.** (2009). "Discovery of 4-substituted methoxybenzoyl-aryl-thiazole as novel anticancer agents: synthesis, biological evaluation, and structure-activity relationships." J Med Chem **52**(6): 1701-11.

Mandairon, N., Peace, S., Karnow, A., Kim, J., **Ennis, M.** and Linster, C. (2008). "Noradrenergic modulation in the olfactory bulb influences spontaneous and reward-motivated discrimination, but not the formation of habituation memory." Eur J Neurosci **27**(5): 1210-9.

Martins, R. A., Zindy, F., Donovan, S., Zhang, J., Pounds, S., Wey, A., Knoepfler, P. S., Eisenman, R. N., Roussel, M. F. and **Dyer, M. A.** (2008). "N-myc coordinates retinal growth with eye size during mouse development." Genes Dev **22**(2): 179-93.

Mastriani, K. S., Williams, V. C., Hulsey, T. C., **Wheless, J. W.** and Maria, B. L. (2008). "Evidence-based versus reported epilepsy management practices." J Child Neurol **23**(5): 507-14.

Matthews, D. B., **Chesler, E. J.**, Cook, M. N., Cockroft, J., Philip, V. M. and Goldowitz, D. (2008). "Genetic mapping of vocalization to a series of increasing acute footshocks using B6.A consomic and B6.D2 congenic mouse strains." Behav Genet **38**(4): 417-23.

Matthews, D. B., Morrow, A. L., O'Buckley, T., Flanigan, T. J., Berry, R. B., Cook, M. N., **Mittleman, G.**, Goldowitz, D., Tokunaga, S. and Silvers, J. M. (2008). "Acute mild footshock alters ethanol drinking and plasma corticosterone levels in C57BL/6J male mice, but not DBA/2J or A/J male mice." Alcohol **42**(6): 469-76.

McGregor, A. (2008). "A case that is not for the faint of heart." Semin Pediatr Neurol **15**(4): 167-72; discussion 172-3.

McKinnon, P. J. (2009). "DNA repair deficiency and neurological disease." Nat Rev Neurosci **10**(2): 100-12.

Merchant, T. E., **Boop, F. A.**, Kun, L. E. and Sanford, R. A. (2008). "A retrospective study of surgery and reirradiation for recurrent ependymoma." Int J Radiat Oncol Biol Phys **71**(1): 87-97.

Merchant, T. E., Kun, L. E., Wu, S., Xiong, X., Sanford, R. A. and **Boop, F. A.** (2009). "Phase II Trial of Conformal Radiation Therapy for Pediatric Low-Grade Glioma." J Clin Oncol.

Merchant, T. E., Li, C., Xiong, X., Kun, L. E., **Boop, F. A.** and Sanford, R. A. (2009). "Conformal radiotherapy after surgery for paediatric ependymoma: a prospective study." Lancet Oncol **10**(3): 258-66.

Mittleman, G., Goldowitz, D., **Heck, D.** H. and Blaha, C. D. (2008). "Cerebellar modulation of frontal cortex dopamine efflux in mice: relevance to autism and schizophrenia." Synapse **62**(7): 544-50.

Miyake, N., Chilton, J., Psatha, M., Cheng, L., Andrews, C., Chan, W. M., Law, K., Crosier, M., Lindsay, S., Cheung, M., Allen, J., Gutowski, N. J., Ellard, S., Young, E., **Iannaccone, A.**, Appukuttan, B., Stout, J. T., Christiansen, S., Ciccarelli, M. L., Baldi, A., Campioni, M., Zenteno, J. C., Davenport, D., Mariani, L. E., Sahin, M., Guthrie, S. and Engle, E. C. (2008). "Human CHN1 mutations hyperactivate alpha2-chimaerin and cause Duane's retraction syndrome." Science **321**(5890): 839-43.

Mohler, M. L., Bohl, C. E., Jones, A., Coss, C. C., Narayanan, R., He, Y., Hwang, D. J., Dalton, J. T. and **Miller, D. D.** (2009). "Nonsteroidal selective androgen receptor modulators (SARMs): dissociating the anabolic and androgenic activities of the androgen receptor for therapeutic benefit." J Med Chem **52**(12): 3597-617.

Mohler, M. L., He, Y., Wu, Z., Hwang, D. J. and **Miller, D. D.** (2009). "Recent and emerging anti-diabetes targets." Med Res Rev **29**(1): 125-95.

Mozhui, K., Ciobanu, D. C., Schikorski, T., Wang, X., **Lu, L.** and **Williams, R. W.** (2008). "Dissection of a QTL hotspot on mouse distal chromosome 1 that modulates neurobehavioral phenotypes and gene expression." PLoS Genet **4**(11): e1000260.

Mulholland, P. J., Hopf, F. W., Bukiya, A. N., Martin, G. E., Liu, J., **Dopico, A. M.**, Bonci, A., Treistman, S. N. and Chandler, L. J. (2009). "Sizing up ethanol-induced plasticity: the role of small and large conductance calcium-activated potassium channels." Alcohol Clin Exp Res **33**(7): 1125-35.

Nai, Q., **Dong, H. W.**, Hayar, A., Linster, C. and **Ennis, M.** (2009). "Noradrenergic regulation of GABAergic inhibition of main olfactory bulb mitral cells varies as a function of concentration and receptor subtype." J Neurophysiol **101**(5): 2472-84.

Narasimhalu, K., Lee, J., **Auchus, A. P.** and Chen, C. P. (2008). "Improving detection of dementia in Asian patients with low education: combining the Mini-Mental State Examination and the Informant Questionnaire on Cognitive Decline in the Elderly." Dement Geriatr Cogn Disord **25**(1): 17-22.

Narayanan, N., **Leffler, C. W.**, Czosnyka, M. and Daley, M. L. (2008). "Assessment of cerebrovascular resistance with model of cerebrovascular pressure transmission." Acta Neurochir Suppl **102**: 37-41.

Narayanan, N., **Leffler, C. W.** and Daley, M. L. (2008). "Influence of hypercapnic vasodilation on cerebrovascular autoregulation and pial arteriolar bed resistance in piglets." J Appl Physiol **105**(1): 152-7.

Narayanan, N., **Leffler, C. W.** and Daley, M. L. (2009). "Assessment of cerebrovascular resistance with a model of cerebrovascular pressure transmission." Med Eng Phys **31**(2): 254-60.

Narayanan, R., Coss, C. C., Yepuru, M., Kearbey, J. D., **Miller, D. D.** and Dalton, J. T. (2008). "Steroidal androgens and nonsteroidal, tissue-selective androgen receptor modulator, S-22, regulate androgen receptor function through distinct genomic and nongenomic signaling pathways." Mol Endocrinol **22**(11): 2448-65.

Narayanan, R., Mohler, M. L., Bohl, C. E., **Miller, D. D.** and Dalton, J. T. (2008). "Selective androgen receptor modulators in preclinical and clinical development." Nucl Recept Signal **6**: e010.

Nelson, R. J. (2009). "Behavioral studies and the IACUC: challenges and opportunities." Ilar J **50**(1): 81-4.

New, J., Kendall, W., Huang, J. and **Chesler, E.** (2008). "Dynamic visualization of coexpression in systems genetics data." IEEE Trans Vis Comput Graph **14**(5): 1081-94.

Northcott, P. A., Nakahara, Y., Wu, X., Feuk, L., Ellison, D. W., Croul, S., Mack, S., Kongkham, P. N., Peacock, J., Dubuc, A., Ra, Y. S., Zilberberg, K., McLeod, J., Scherer, S. W., Sunil Rao, J., Eberhart, C. G., Grajkowska, W., Gillespie, Y., Lach, B., Grundy, R., Pollack, I. F., Hamilton, R. L., Van Meter, T., Carlotti, C. G., **Boop, F.**, Bigner, D., Gilbertson, R. J., Rutka, J. T. and Taylor, M. D. (2009). "Multiple recurrent genetic events converge on control of histone lysine methylation in medulloblastoma." Nat Genet **41**(4): 465-72.

Oliver, G. and Srinivasan, R. S. (2008). "Lymphatic vasculature development: current concepts." Ann N Y Acad Sci **1131**: 75-81.

Papanicolaou, A. C., Castillo, E., Pataraia, E., **Wheless, J.**, Breier, J. and Simos, P. (2008). "A response to the article of Lau et al. "A systematic review on MEG and its use in the presurgical evaluation of localization related epilepsy", Epilepsy Research 2008;79(May (2-3)):97-104." Epilepsy Res **82**(2-3): 237; author reply 240-1.

Pare, P. E., Chan, F. W., Bhattacharya, S. and Goel, V. K. (2009). "Surface slide track mapping of implants for total disc arthroplasty." J Biomech **42**(2): 131-9.

Parfenova, H. and **Leffler, C. W.** (2008). "Cerebroprotective functions of HO-2." Curr Pharm Des **14**(5): 443-53.

Patil, S., Bukiya, A. N., Li, W., **Dopico, A. M.** and **Miller, D.** (2008). "Design and synthesis of hydroxy-alkynoic acids and their methyl esters as novel activators of BK channels." Bioorg Med Chem Lett **18**(11): 3427-30.

Patil, S. A., Patil, R. and **Miller, D. D.** (2009). "Solid phase synthesis of biologically important indoles." Curr Med Chem **16**(20): 2531-65.

Pattarini, R., Rong, Y., Qu, C. and **Morgan, J. I.** (2008). "Distinct mechanisms of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyrimidine resistance revealed by transcriptome mapping in mouse striatum." Neuroscience **155**(4): 1174-94.

Pavicevic, Z., Leslie, C. C. and **Malik, K. U.** (2008). "cPLA2 phosphorylation at serine-515 and serine-505 is required for arachidonic acid release in vascular smooth muscle cells." J Lipid Res **49**(4): 724-37.

Peirce, J. L., Broman, K. W., **Lu, L.**, **Chesler, E. J.**, Zhou, G., Airey, D. C., Birmingham, A. E. and **Williams, R. W.** (2008). "Genome Reshuffling for Advanced Intercross Permutation (GRAIP): simulation and permutation for advanced intercross population analysis." PLoS One **3**(4): e1977.

Pennell, P. B. and **Hovinga, C. A.** (2008). "Antiepileptic drug therapy in pregnancy I: gestation-induced effects on AED pharmacokinetics." Int Rev Neurobiol **83**: 227-40.

Perkins, F. F., Jr., Breier, J., McManis, M. H., Castillo, E., **Wheless, J.**, **McGregor, A. L.**, Chacon, M. and **Clarke, D. F.** (2008). "Benign rolandic epilepsy -- perhaps not so benign: use of magnetic source imaging as a predictor of outcome." J Child Neurol **23**(4): 389-93.

Pounds, S. and **Dyer, M. A.** (2008). "Statistical analysis of data from retroviral clonal experiments in the developing retina." Brain Res **1192**: 178-85.

Prosser, R. A., Mangrum, C. A. and Glass, J. D. (2008). "Acute ethanol modulates glutamatergic and serotonergic phase shifts of the mouse circadian clock in vitro." Neuroscience **152**(3): 837-48.

Ramagiri, S., Gupte, R., Rakov, I., Yates, C. R. and **Miller, D. D.** (2008). "Quantitative chiral analysis of phthaloylglutamic acid and related analogs by a single ratio kinetic method using electrospray ionization and matrix-assisted laser desorption techniques." Rapid Commun Mass Spectrom **22**(5): 639-46.

Ramagiri, S., Ma, F., Kosanam, H., Wang, X., Patil, R., **Miller, D. D.**, **Geisert, E.** and Yates, C. R. (2009). "Fast and sensitive liquid chromatography/electrospray mass spectrometry method to study ocular penetration of EDL-155, a novel antitumor agent for retinoblastoma in rats." J Mass Spectrom **44**(5): 786-93.

Reiner, A. (2009). "Avian evolution: from Darwin's finches to a new way of thinking about avian forebrain organization and behavioural capabilities." Biol Lett **5**(1): 122-4.

Reiner, D. J., Jan, T. A., **Boughter, J. D., Jr.**, **Li, C. X.**, **Lu, L.**, **Williams, R. W.** and **Waters, R. S.** (2008). "Genetic analysis of tongue size and taste papillae number and size in recombinant inbred strains of mice." Chem Senses **33**(8): 693-707.

Rex, T. S., Wong, Y., Kodali, K. and Merry, S. (2009). "Neuroprotection of photoreceptors by direct delivery of erythropoietin to the retina of the retinal degeneration slow mouse." Exp Eye Res.

Richardson, R. J., Blundon, J. A., Bayazitov, I. T. and **Zakharenko, S. S.** (2009). "Connectivity patterns revealed by mapping of active inputs on dendrites of thalamorecipient neurons in the auditory cortex." J Neurosci **29**(20): 6406-17.

Rizk, E., Dias, M. S., Verbrugge, J. and **Boop, F. A.** (2009). "Intracardiac migration of a distal shunt catheter: an unusual complication of ventricular shunts. Report of 2 cases." J Neurosurg Pediatr **3**(6): 525-8.

Robertson, J. H. (2008). "Neurosurgery and industry." J Neurosurg **109**(6): 979-88.

Rodriguez-Galindo, C., Wilson, M. W., Chantada, G., Fu, L., Qaddoumi, I., Antoneli, C., Leal-Leal, C., Sharma, T., Barnoya, M., Epelman, S., Pizzarello, L., Kane, J. R., Barfield, R., Merchant, T. E., Robison, L. L., Murphree, A. L., Chevez-Barrios, P., **Dyer, M. A.**, O'Brien, J., Ribeiro, R. C., Hungerford, J., Helveston, E. M., Haik, B. G. and Wilimas, J. (2008). "Retinoblastoma: one world, one vision." Pediatrics **122**(3): e763-70.

Ruby, C. L., Brager, A. J., Depaul, M. A., **Prosser, R. A.** and Glass, J. D. (2009). "Chronic Ethanol Attenuates Circadian Photic Phase-Resetting and Alters Nocturnal Activity Patterns in the Hamster." Am J Physiol Regul Integr Comp Physiol.

Ruby, C. L., **Prosser, R. A.**, DePaul, M. A., Roberts, R. J. and Glass, J. D. (2009). "Acute ethanol impairs photic and nonphotic circadian phase resetting in the Syrian hamster." Am J Physiol Regul Integr Comp Physiol **296**(2): R411-8.

Saccone, S. F., Bierut, L. J., **Chesler, E. J.**, Kalivas, P. W., Lerman, C., Saccone, N. L., Uhl, G. R., Li, C. Y., Philip, V. M., Edenberg, H. J., Sherry, S. T., Feolo, M., Moyzis, R. K. and Rutter, J. L. (2009). "Supplementing high-density SNP microarrays for additional coverage of disease-related genes: addiction as a paradigm." PLoS One **4**(4): e5225.

Sacks, H. S., Fain, J. N., Holman, B., Cheema, P., Chary, A., Parks, F., Karas, J., Optican, R., **Bahouth, S. W.**, Garrett, E., Wolf, R. Y., Carter, R. A., Robbins, T., Wolford, D. and Samaha, J. (2009). "Uncoupling Protein-1 and related mRNAs in Human Epicardial and Other Adipose Tissues: Epicardial Fat functioning as Brown Fat." J Clin Endocrinol Metab.

Sanders, R. P., Onar, A., Boyett, J. M., Broniscer, A., Morris, E. B., Qaddoumi, I., Armstrong, G. T., **Boop, F. A.**, Sanford, R. A., Kun, L. E., Merchant, T. E. and Gajjar, A. (2008). "M1 Medulloblastoma: high risk at any age." J Neurooncol **90**(3): 351-5.

Sanford, R. A., Merchant, T. E., Zwienenberg-Lee, M., Kun, L. E. and **Boop, F. A.** (2009). "Advances in surgical techniques for resection of childhood cerebellopontine angle ependymomas are key to survival." Childs Nerv Syst.

Schilling, B. K., Karlage, R. E., **LeDoux, M. S.**, **Pfeiffer, R. F.**, Weiss, L. W. and Falvo, M. J. (2009). "Impaired leg extensor strength in individuals with Parkinson disease and relatedness to functional mobility." Parkinsonism Relat Disord.

Scroggs, R. S. (2008). "Evidence of a physiological role for use-dependent inactivation of NaV1.8 sodium channels." J Physiol **586**(4): 923.

Selektor, Y., Ahokas, R. A., **Bhattacharya, S. K.**, Sun, Y., Gerling, I. C. and Weber, K. T. (2008). "Cinacalcet and the prevention of secondary hyperparathyroidism in rats with aldosteronism." Am J Med Sci **335**(2): 105-10.

Selektor, Y., Parker, R. B., Sun, Y., Zhao, W., **Bhattacharya, S. K.** and Weber, K. T. (2008). "Tissue 65Zinc translocation in a rat model of chronic aldosteronism." J Cardiovasc Pharmacol **51**(4): 359-64.

Shahabi, N. A., McAllen, K. and **Sharp, B. M.** (2008). "Stromal cell-derived factor 1-alpha (SDF)-induced human T cell chemotaxis becomes phosphoinositide 3-kinase (PI3K)-independent: role of PKC-theta." J Leukoc Biol **83**(3): 663-71.

Sharma, R. K., Netland, P. A., Kedrov, M. A. and **Johnson, D. A.** (2009). "Preconditioning protects the retinal pigment epithelium cells from oxidative stress-induced cell death." Acta Ophthalmol **87**(1): 82-8.

Sharma, R. K., **Zhou, Q.** and Netland, P. A. (2008). "Effect of oxidative preconditioning on neural progenitor cells." Brain Res **1243**: 19-26.

Shih, C. S., Laurie, N., Holzmacher, J., Spence, Y., Nathwani, A. C., Davidoff, A. M. and **Dyer, M. A.** (2009). "AAV-mediated local delivery of interferon-beta for the treatment of retinoblastoma in preclinical models." Neuromolecular Med **11**(1): 43-52.

Shull, E. R., Lee, Y., Nakane, H., Stracker, T. H., Zhao, J., Russell, H. R., Petrini, J. H. and **McKinnon, P. J.** (2009). "Differential DNA damage signaling accounts for distinct neural apoptotic responses in ATLD and NBS." Genes Dev **23**(2): 171-80.

Song, M. J., Lewis, C. K., Lance, E. R., **Chesler, E. J.**, Yordanova, R. K., Langston, M. A., Lodowski, K. H. and Bergeson, S. E. (2009). "Reconstructing generalized logical networks of transcriptional regulation in mouse brain from temporal gene expression data." EURASIP J Bioinform Syst Biol: 545176.

Song, P., Ma, F., Wang, F., Wang, X., Patil, R., Ramagiri, S., Orr, W. E., **Miller, D. D.**, **Geisert, E.** and Yates, C. R. (2008). "Plasma and cerebrospinal fluid pharmacokinetics of the novel tetrahydroisoquinoline EDL-155 in rats." Cancer Chemother Pharmacol **61**(6): 1037-44.

St John, S. J. and **Boughter, J. D., Jr.** (2009). "Orosensory responsiveness to and preference for hydroxide-containing salts in mice." Chem Senses **34**(6): 487-98.

Steinle, J. J., Cappocia, F. C., Jr. and Jiang, Y. (2008). "Beta-adrenergic receptor regulation of growth factor protein levels in human choroidal endothelial cells." Growth Factors **26**(6): 325-30.

Steinle, J. J., Chin, V. C., Williams, K. P. and Panjala, S. R. (2008). "Beta-adrenergic receptor stimulation modulates iNOS protein levels through p38 and ERK1/2 signaling in human retinal endothelial cells." Exp Eye Res **87**(1): 30-4.

Steinle, J. J., Kern, T. S., Thomas, S. A., McFadyen-Ketchum, L. S. and Smith, C. P. (2009). "Increased basement membrane thickness, pericyte ghosts, and loss of retinal thickness and cells in dopamine beta hydroxylase knockout mice." Exp Eye Res **88**(6): 1014-9.

Steinle, J. J., Sharma, S. and Chin, V. C. (2008). "Normal aging involves altered expression of growth factors in the rat choroid." J Gerontol A Biol Sci Med Sci **63**(2): 135-40.

Steinle, J. J., Sharma, S., Smith, C. P. and McFayden-Ketchum, L. S. (2009). "Normal aging involves modulation of specific inflammatory markers in the rat retina and choroid." J Gerontol A Biol Sci Med Sci **64**(3): 325-31.

Stratikopoulos, E., Szabolcs, M., **Dragatsis, I.**, Klinakis, A. and Efstratiadis, A. (2008). "The hormonal action of IGF1 in postnatal mouse growth." Proc Natl Acad Sci U S A **105**(49): 19378-83.

Suzuki, T., Elias, B. C., Seth, A., Shen, L., Turner, J. R., Giorgianni, F., **Desiderio, D.**, Guntaka, R. and Rao, R. (2009). "PKC eta regulates occludin phosphorylation and epithelial tight junction integrity." Proc Natl Acad Sci U S A **106**(1): 61-6.

Tavalin, S. J. (2008). "AKAP79 selectively enhances protein kinase C regulation of GluR1 at a Ca2+-calmodulin-dependent protein kinase II/protein kinase C site." J Biol Chem **283**(17): 11445-52.

Teruyama, R., Lipschitz, D. L., Wang, L., Ramoz, G. R., Crowley, W. R., Bealer, S. L. and **Armstrong, W. E.** (2008). "Central blockade of oxytocin receptors during mid-late gestation reduces amplitude of slow afterhyperpolarization in supraoptic oxytocin neurons." Am J Physiol Endocrinol Metab **295**(5): E1167-71.

Thompson, J. W., Newman, L., **Boop, F. A.** and Sanford, R. A. (2009). "Management of postoperative swallowing dysfunction after ependymoma surgery." Childs Nerv Syst.

Tichansky, D. S., **Boughter, J. D., Jr.**, Harper, J., Glatt, A. R. and Madan, A. K. (2008). "Gastric bypass surgery in rats produces weight loss modeling after human gastric bypass." Obes Surg **18**(10): 1246-50.

Tobin, K. W., Abramoff, M. D., **Chaum, E.**, Giancardo, L., Govindasamy, V., Karnowski, T. P., Tennant, M. T. and Swainson, S. (2008). "Using a patient image archive to diagnose retinopathy." Conf Proc IEEE Eng Med Biol Soc **2008**: 5441-4.

Tokita, K., Inoue, T. and **Boughter, J. D., Jr.** (2009). "Afferent connections of the parabrachial nucleus in C57BL/6J mice." Neuroscience **161**(2): 475-88.

Vaithianathan, T., Bukiya, A., Liu, J., Liu, P., Asuncion-Chin, M., Fan, Z. and **Dopico, A.** (2008). "Direct regulation of BK channels by phosphatidylinositol 4,5-bisphosphate as a novel signaling pathway." J Gen Physiol **132**(1): 13-28.

Valicenti-McDermott, M. D., **McVicar, K.**, Cohen, H. J., Wershil, B. K. and Shinnar, S. (2008). "Gastrointestinal symptoms in children with an autism spectrum disorder and language regression." Pediatr Neurol **39**(6): 392-8.

Wang, D., Zaitsev, S., Taylor, G., **D'Azzo, A.** and Bonten, E. (2009). "Protective Protein/Cathepsin A Rescues N-glycosylation defects in Neuraminidase-1." Biochim Biophys Acta.

Wang, F., Chen, H. and **Sharp, B. M.** (2008). "Neuroadaptive changes in the mesocortical glutamatergic system during chronic nicotine self-administration and after extinction in rats." J Neurochem **106**(2): 943-56.

Wang, X., Nookala, S., Narayanan, C., Giorgianni, F., Beranova-Giorgianni, S., McCollum, G., Gerling, I., Penn, J. S. and **Jablonski, M. M.** (2009). "Proteomic analysis of the retina: removal of RPE alters outer segment assembly and retinal protein expression." Glia **57**(4): 380-92.

Wang, Z., Lu, Y., Seibel, W., **Miller, D. D.** and Li, W. (2009). "Identifying novel molecular structures for advanced melanoma by ligand-based virtual screening." J Chem Inf Model **49**(6): 1420-7.

Watanabe, K., Kita, T. and **Kita, H.** (2009). "Presynaptic actions of D2-like receptors in the rat cortico-striato-globus pallidus disynaptic connection in vitro." J Neurophysiol **101**(2): 665-71.

Weber, T., Corbett, M. K., Chow, L. M., Valentine, M. B., Baker, S. J. and **Zuo, J.** (2008). "Rapid cell-cycle reentry and cell death after acute inactivation of the retinoblastoma gene product in postnatal cochlear hair cells." Proc Natl Acad Sci U S A **105**(2): 781-5.

Wei, L., Fan, M., Xu, L., Heinrich, K., Berry, M. W., **Homayouni, R.** and Pfeffer, L. M. (2008). "Bioinformatic analysis reveals cRel as a regulator of a subset of interferon-stimulated genes." J Interferon Cytokine Res **28**(9): 541-51.

Wei, P., Rong, Y., Li, L., Bao, D. and **Morgan, J. I.** (2009). "Characterization of trans-neuronal trafficking of Cbln1." Mol Cell Neurosci **41**(2): 258-73.

Whelan, H. T., Cook, J. D., Amlie-Lefond, C. M., **Hovinga, C. A.**, Chan, A. K., Ichord, R. N., Deveber, G. A. and Thall, P. F. (2008). "Practical model-based dose finding in early-phase clinical trials: optimizing tissue plasminogen activator dose for treatment of ischemic stroke in children." Stroke **39**(9): 2627-36.

Wheless, J. W. (2008). "History of the ketogenic diet." Epilepsia **49 Suppl 8**: 3-5.

Wheless, J. W., Carmant, L., Bebin, M., Conry, J. A., Chiron, C., Elterman, R. D., Frost, M., Paolicchi, J. M., Donald Shields, W., Thiele, E. A., Zupanc, M. L. and Collins, S. D. (2009). "Magnetic resonance imaging abnormalities associated with vigabatrin in patients with epilepsy." Epilepsia **50**(2): 195-205.

Wheless, J. W., **Clarke, D.**, **Hovinga, C. A.**, Ellis, M., Durmeier, M., **McGregor, A.** and **Perkins, F.** (2009). "Rapid Infusion of a Loading Dose of Intravenous Levetiracetam With Minimal Dilution: A Safety Study." J Child Neurol.

Wheless, J. W., Manjunath, R., Phelps, S. J., Asato, M. R., Sheth, R. D., **Hovinga, C. A.**, Pina-Garza, J. E., Haskins, L. S. and Zingaro, W. M. (2008). "Seizure emergency plans: patient results from a cross-sectional epilepsy survey." Epilepsy Behav **13**(3): 489-93.

Wheless, J. W. and Treiman, D. M. (2008). "The role of the newer antiepileptic drugs in the treatment of generalized convulsive status epilepticus." Epilepsia **49 Suppl 9**: 74-8.

Williams, K. P. and **Steinle, J. J.** (2009). "Maintenance of beta-adrenergic receptor signaling can reduce fas signaling in human retinal endothelial cells." Exp Eye Res.

Williams, R. F., Magnotti, L. J., Croce, M. A., Hargraves, B. B., Fischer, P. E., Schroeppel, T. J., Zarzaur, B. L., Muhlbauer, M., **Timmons, S.** D. and Fabian, T. C. (2009). "Impact of decompressive craniectomy on functional outcome after severe traumatic brain injury." J Trauma **66**(6): 1570-4; discussion 1574-6.

Wilson, D. M., 3rd, Bohr, V. A. and **McKinnon, P. J.** (2008). "DNA damage, DNA repair, ageing and age-related disease." Mech Ageing Dev **129**(7-8): 349-52.

Wu, X., Wang, X., Gao, J., Yu, Y., Jia, S., Zheng, J., Dallos, P., He, D. Z., Cheatham, M. and **Zuo, J.** (2008). "Glucose transporter 5 is undetectable in outer hair cells and does not contribute to cochlear amplification." Brain Res **1210**: 20-8.

Xi, Q., Adebiyi, A., Zhao, G., Chapman, K. E., Waters, C. M., Hassid, A. and **Jaggar, J. H.** (2008). "IP3 constricts cerebral arteries via IP3 receptor-mediated TRPC3 channel activation and independently of sarcoplasmic reticulum Ca2+ release." Circ Res **102**(9): 1118-26.

Xiao, J., Bastian, R. W., Perlmutter, J. S., Racette, B. A., Tabbal, S. D., Karimi, M., Paniello, R. C., Blitzer, A., Batish, S. D., Wszolek, Z. K., Uitti, R. J., Hedera, P., Simon, D. K., Tarsy, D., Truong, D. D., Frei, K. P., **Pfeiffer, R. F.**, Gong, S., Zhao, Y. and **LeDoux, M. S.** (2009). "High-throughput mutational analysis of TOR1A in primary dystonia." BMC Med Genet **10**: 24.

Xie, X. and **Steketee, J.** D. (2008). "Repeated exposure to cocaine alters the modulation of mesocorticolimbic glutamate transmission by medial prefrontal cortex Group II metabotropic glutamate receptors." J Neurochem **107**(1): 186-96.

Xie, X. and **Steketee, J.** D. (2009). "Effects of repeated exposure to cocaine on group II metabotropic glutamate receptor function in the rat medial prefrontal cortex: behavioral and neurochemical studies." Psychopharmacology (Berl) **203**(3): 501-10.

Xu, C., **Zhang, Y. H.**, Thangavel, M., Richardson, M. M., Liu, L., Zhou, B., Zheng, Y., Ostrom, R. S. and Zhang, X. A. (2009). "CD82 endocytosis and cholesterol-dependent reorganization of tetraspanin webs and lipid rafts." Faseb J.

Yin, Z., Tong, Y., Zhu, H. and **Watsky, M. A.** (2008). "ClC-3 is required for LPA-activated Cl-current activity and fibroblast-to-myofibroblast differentiation." Am J Physiol Cell Physiol **294**(2): C535-42.

Yogalingam, G., Bonten, E. J., van de Vlekkert, D., Hu, H., Moshiach, S., Connell, S. A. and **D'Azzo, A.** (2008). "Neuraminidase 1 is a negative regulator of lysosomal exocytosis." Dev Cell **15**(1): 74-86.

Yu, G., Chen, H., Zhao, W., **Matta, S. G.** and **Sharp, B. M.** (2008). "Nicotine self-administration differentially regulates hypothalamic corticotropin-releasing factor and arginine vasopressin mRNAs and facilitates stress-induced neuronal activation." J Neurosci **28**(11): 2773-82.

Yu, Y. and **Zuo, J.** (2009). "The practical use of Cre and loxP technologies in mouse auditory research." Methods Mol Biol **493**: 87-102.

Zhang, H., Das, S., Li, Q. Z., **Dragatsis, I.**, Repa, J., Zeitlin, S., Hajnoczky, G. and Bezprozvanny, I. (2008). "Elucidating a normal function of huntingtin by functional and microarray analysis of huntingtin-null mouse embryonic fibroblasts." BMC Neurosci **9**: 38.

Zhao, G., Adebiyi, A., Blaskova, E., Xi, Q. and **Jaggar, J. H.** (2008). "Type 1 inositol 1,4,5-trisphosphate receptors mediate UTP-induced cation currents, Ca2+ signals, and vasoconstriction in cerebral arteries." Am J Physiol Cell Physiol **295**(5): C1376-84.

Zhao, T., Wang, D., Cheranov, S. Y., Karpurapu, M., Chava, K. R., Kundumani-Sridharan, V., **Johnson, D. A.**, Penn, J. S. and Rao, G. N. (2009). "A novel role for activating transcription factor-2 in 15(S)-hydroxyeicosatetraenoic acid-induced angiogenesis." J Lipid Res **50**(3): 521-33.

Zhao, Y., DeCuypere, M. and **LeDoux, M. S.** (2008). "Abnormal motor function and dopamine neurotransmission in DYT1 DeltaGAG transgenic mice." Exp Neurol **210**(2): 719-30.

Zhao, Y., Xiao, J., Ueda, M., Wang, Y., Hines, M., **Nowak, T. S.**, Jr. and **LeDoux, M. S.** (2008). "Glial elements contribute to stress-induced torsinA expression in the CNS and peripheral nervous system." Neuroscience **155**(2): 439-53.

Zhou, F. W., **Matta, S. G.** and **Zhou, F. M.** (2008). "Constitutively active TRPC3 channels regulate basal ganglia output neurons." J Neurosci **28**(2): 473-82.

Zhu, L., Gibson, P., Currle, D. S., Tong, Y., Richardson, R. J., Bayazitov, I. T., Poppleton, H., **Zakharenko, S.**, Ellison, D. W. and Gilbertson, R. J. (2009). "Prominin 1 marks intestinal stem cells that are susceptible to neoplastic transformation." Nature **457**(7229): 603-7.

Zhu, L., Lu, Y., **Miller, D. D.** and Mahato, R. I. (2008). "Structural and formulation factors influencing pyridinium lipid-based gene transfer." Bioconjug Chem **19**(12): 2499-512.

Zhu, L., Ye, Z., Cheng, K., **Miller, D. D.** and Mahato, R. I. (2008). "Site-specific delivery of oligonucleotides to hepatocytes after systemic administration." Bioconjug Chem **19**(1): 290-8.

Zmijewski, M. A., Li, W., Zjawiony, J. K., Sweatman, T. W., Chen, J., **Miller, D. D.** and Slominski, A. T. (2008). "Synthesis and photo-conversion of androsta- and pregna-5,7-dienes to vitamin D3-like derivatives." Photochem Photobiol Sci **7**(12): 1570-6.

Zmijewski, M. A., Li, W., Zjawiony, J. K., Sweatman, T. W., Chen, J., **Miller, D. D.** and Slominski, A. T. (2009). "Photo-conversion of two epimers (20R and 20S) of pregna-5,7-diene-3beta, 17alpha, 20-triol and their bioactivity in melanoma cells." Steroids **74**(2): 218-28.

2) Presentations at the 2008 *Society for Neuroscience* meeting (Washington, DC)

Augustinaite, I, Bell, T, **Ennis, M**, and **Zhang, YH**. The rostroventromedial medulla (RVM) is a key opioid site for the production of taste analgesia. *Neuroscience Abstract, 2008*.

Brooks, IM, and **Tavalin, SJ**. Akap79-anchored pkc masquerades as camkii. *Neuroscience Abstract, 2008.*

Chen, H, **Matta, S**, and **Sharp, B**. Full gestational exposure to nicotine and ethanol reduces the density of dendritic spines in the prelimbic cortex of adolescent rat offspring. *Neuroscience Abstract, 2008.*

Chen, PC, Vargas, MR, Messing, A, Hagemann, TL, Pani, AK, **Smeyne, RJ**, **Johnson, DA**, and Johnson, JA. Neuroprotective actions of Nrf2 in the MPTP mouse Model of Parkinson's disease. *Neuroscience Abstract, 2008*.

Cox, BC, Papal, S, Steigelman, KA, and **Zuo, J**. Effect of $p16^{Ink4a}$ deletion on cochlear hair cells after damage with ototoxic drugs. *Neuroscience Abstract, 2008.*

De March, Z, Deng, Y, and **Reiner, A**. Possible role of striatal parvalbuminergic neurons in dystonia in Huntington's disease. *Neuroscience Abstract, 2008.*

Deng, Y, Del Mar, N, **Goldowitz, D**, and **Reiner, AJ**. Evidence from R6/2 chimeric mice that striatal injury in HD is driven by expression of mutant protein in corticostriatal neurons. *Neuroscience Abstract, 2008.*

Dhanushkodi, A, Ding, Y, Fan, GH, and **McDonald, MP**. Neuroprotective effects of GD3 synthase inhibition in the MPTP Model of Parkinson's disease. *Neuroscience Abstract, 2008.*

Dickson, PE, Martin, LA, **Goldowitz, D**, **Heck, DH**, Blaha, CD, and **Mittleman, G**. Executive function and the cerebellum: Defining the neural substrates of autistic behavior using a mouse model. *Neuroscience Abstract, 2008.*

Dong, H, Nai, Q, and **Ennis, M**. Activity-dependent plasticity in the strength of olfactory nerve (ON) synapses in the rat main olfactory bulb (MOB). *Neuroscience Abstract, 2008.*

Elberger, AJ, Moore, BM, Surley, SN, and Xue, Y. A novel cannabinoid analog is a potent chemotherapy agent for glioblastoma multiforme: in vitro effects. *Neuroscience Abstract, 2008.*

Foehring, FC, and Guan, D. Development of voltage-gated potassium currents in rat somatosensory neocortical pyramidal neurons. *Neuroscience Abstract, 2008.*

Ha, TJ, Swanson, D, Glenn, R, Tong, Y, **Homayouni, R**, Tjioe, E, **Chesler, E**, Duvvuru, S, and **Goldowitz, D**. Identification of Pax6-dependent developmentally regulated genes of cerebellar granule neurons. *Neuroscience Abstract, 2008*.

Habiby Kermany, M, Zhou, B, Cai, Q, Cai, C, and **Yoo, T**. Cytokine gene vaccine restores memory in Alzheimer's disease. *Neuroscience Abstract, 2008.*

Hamre, KM, Cook, MN, Phillips, VM, **Chesler, EJ**, and **Goldowitz, D**. Genetic analysis of depression, anxiety and stress phenotypes using the expanded BXD recombinant inbred mouse lines. *Neuroscience Abstract, 2008.*

Heck, DH, Zhao, Y, Roy, S, **LeDoux, M**, and **Reiter, LT**. A quantitative phenotype derived from fluid licking behavior differentiates between maternal UBE3A deficient, knock out and wild type mice. *Neuroscience Abstract, 2008.*

Jang, H, Boltz, D, Webster, R, and **Smeyne, RJ**. Does H5N1 influenza virus induce encephalitis and parkinsonism in the mammalian CNS? *Neuroscience Abstract, 2008.*

Kenchaiaih, S, and **Hamre, KM**. Age-related differences in ethanol responses and depression analysis in adolescent DBA/2J mice compared to adult DBA/2J mice. *Neuroscience Abstract, 2008.*

Kusnoor, SV, **Morgan, JI**, and Deutch, AY. Cbln1 is expressed in PF but not CM thalamostriatal neurons. *Neuroscience Abstract, 2008.*

Lee, S, Shin, Y, and **Levin, MC**. Patients with HTLV-1 (human T lymphotropic virus type 1) associated neurologic disease develop antibodies reactive with autologous ABO blood group antigens. *Neuroscience Abstract, 2008*.

Li, C, **Fitzgerald, MEC**, **LeDoux, MS**, and **Reiner, AJ**. Central neuronal cell groups involved in parasympathetic regulation of choroidal blood flow in the eye via the pterygopalatine ganglion and their interconnections. *Neuroscience Abstract, 2008.*

Li, CX, Yang, Q, and **Waters, RS**. Reorganization of cuneate nucleus (CN) following forelimb amputation in juvenile rats; prelude for understanding reorganization in forepaw barrel subfield (FBS) cortex. *Neuroscience Abstract, 2008.*

Liu, Y, Denton, JM, and **Nelson, RJ**. Primary somatosensory cortical (SI) neurons with no detectable receptive fields show suppression of activity during initiation of wrist movement guided by vibratory input in monkeys. *Neuroscience Abstract, 2008.*

Mittleman, G, **Goldowitz, D**, and **Chesler, EJ**. Identification of genes involved in sensitivity to cocaine and morphine, and the severity of morphine withdrawal. *Neuroscience Abstract, 2008.*

Mou, X, Laird, J, Peterson, C, and **Prosser, R**. Glutamate modulation of tPA and related fibrinolytic proteins in the mouse suprachiasmatic nucleus in vitro. *Neuroscience Abstract, 2008.*

Nai, Q, **Dong, H**, Linster, C, and **Ennis, M**. Activation of alpha1 and alpha2 noradrenergic receptors differentially regulates excitability of granule cells in the main olfactory bulb. *Neuroscience Abstract, 2008.*

Pani, AJ, Griner, J, **Smeyne, R**, and Jiao, Y. Effect of ageing and oxidative stress on dopamine metabolism in the swiss-webster mice. *Neuroscience Abstract, 2008.*

Pate, TD, Lester, DB, Miller, AD, **Mittleman, G**, and Blaha, CD. Midbrain nicotinic and muscarinic acetylcholine and ionotropic glutamate receptors mediate dopamine release in the nucleus accumbens of mice. *Neuroscience Abstract, 2008.*

Perez-Otano, I, Saint-Michael, E, Chowdhury, D, Marco, S, Brooks, IM, Zandueta, A, Martinez-Turrillas, R, and **Tavalin, SJ**. A tyrosine-based motif regulates the endocytosis of NR3A-containing NMDA receptors. *Neuroscience Abstract, 2008.*

Philip, VM, Jay, J, Zhang, Y, Langston, MA, Baker, EJ, and **Chesler, EJ**. Integrating genomic analyses of addiction related phenotypes across species and experimental model system using the Ontological Discovery Environment. *Neuroscience Abstract, 2008.*

Phillips, CA, Perkins, AD, Wolen, AR, **Chesler, EJ**, Miles, MF, and Langston, MA. Graph-theoretical algorithmic analysis of microarray data for identification of murine brain ethanol-regulated gene networks. *Neuroscience Abstract, 2008.*

Prosser, RA, McElroy, B, Zakaria, A, and Glass, JD. GABA antagonist modulates ethanol actions on photic and nonphotic resetting of the SCN circadian clock. *Neuroscience Abstract, 2008.*

Qiao, S, Kim, SH, Tummala, H, and **Homayouni, R**. Expression of Dab2IP transcript variants in the developing brain. *Neuroscience Abstract, 2008.*

Reiner, AJ, Lei, W, and Deng, Y. Evidence for two types of cortical projections to striatum in rhesus monkeys. *Neuroscience Abstract, 2008.*

Savchenko,VL, and **Boughter, JDJ**. Regulation of neuronal activity by caffeine and alpha-2a adrenergic receptor agonist, guanfacine. *Neuroscience Abstract, 2008.*

Schikorski, TA, and Shiue, M. The recycling pool – correlations with synaptic structure and adaptation to activity. *Neuroscience Abstract, 2008.*

Steigelman, KA, Wu, X, Gao, J, Qian, F, Piontek, KB, Germino, G, and **Zuo, J**. Potential roles of Pkd1 in mechanoelectrotransduction of mouse cochlear hair cells. *Neuroscience Abstract, 2008.*

Swanson, DJ, Ha, T, Glenn, R, Cui, Y, **Homayouni, R**, Berry, M, Tjioe, E, Langston, MA, Phillips, C, Song, J, **Chesler, EJ**, Duvvuru, S, Brauer, E, **Hamre, K**, and **Goldowitz, D**. Gene regulation in time and space (grits): molecular signatures of cerebellar development. *Neuroscience Abstract, 2008.*

Tavalin, SJ, Wingerd, JI, and Hodge, RS. A convertible inverted/upright imaging platform suitable for neurophysiology. *Neuroscience Abstract, 2008.*

Waters, RS, Yang, Q, and **Li, CX**. Organization of cuneate nucleus in juvenile rats. *Neuroscience Abstract, 2008.*

Zhao, Y, Sharma, N, and **LeDoux, M**. Cytochrome oxidase metabolic mapping reveals dysfunctional networks in DYT1 dystonia. *Neuroscience Abstract, 2008.*

Zhou, F, Jin, Y, Xu, M, and **Zhou, FM**. Direct dopamine regulation of basal ganglia output neurons. *Neuroscience Abstract, 2008.*

Zhou, FM, De Bias, M, Zhou, F, Gong, S, Zhang, L, Gu, H, **LeDoux, MS**, and Dani, JA. Cocaine inhibition of nicotinic acetylcholine receptors enhances phasic dopamine release in the striatum. *Neuroscience Abstract, 2008.*

APPENDIX 3

Neuroscience Seminar Speakers

FY 2008-2009

THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER
THE NEUROSCIENCE INSTITUTE

FALL 2008 SEMINAR SERIES SCHEDULE

Christopher A. Del Negro, Ph.D. (Detlef Heck, host) September 9, 2008
Assistant Professor
Department of Applied Science
McGlothlin-Street Hall, Room 318
The College of William and Mary
Williamsburg, VA 23187-8795
Title: "The source of inspiration: cellular mechanisms that generate breathing rhythm in mammals"

Fu-Ming Zhou, Ph.D. September 16, 2008
Assistant Professor
Department of Pharmacology
UTHSC
Title: "An Ultra-Short Dopamine Pathway Regulates Basal Ganglia Output"

David Sulzer, Ph.D. (Fu-Ming Zhou, host) September 23, 2008
Associate Professor
Depts of Psychiatry, Neurology, & Pharmacology
Black Building Room 309
650 W 168th St
New York, NY 10032
Title: "New optical approaches for understanding the synaptic selection underlying habit formation"

Robert F. Lundy, Jr., Ph.D. (John Boughter, host) September 30, 2008
Assistant Professor
Anatomical Sciences/Neurobiology
University of Louisville School of Medicine
500 South Preston Street
Research Tower, Room 103
Louisville, KY 40292
Title: "Descending Modulation of Brainstem Taste Processing: A Potential Mechanism for Coding Gustatory Hedonic Value"

Clark W. Blatteis, Ph.D. October 14, 2008
Professor
Department of Physiology
UTHSC
Title: "Immune-to-Brain Pathway for Induction of Fever by Bacterial Lipopolysaccharides: The Concept Has Changed"

Jian Zuo, Ph.D. October 21, 2008
Associate Member
Department of Developmental Neurobiology
St. Jude Children's Research Hospital
332 N. Lauderdale
Memphis, TN 38105
Title: "Sound Amplification and Hair Cell Regeneration in Mammalian Cochleae"

Rosalinda C. Roberts, Ph.D. (Anton Reiner, host) October 28, 2008
Kathy Ireland Professor of Psychiatry
University of Alabama @ Birmingham
865D Sparks Center
1720 7th Avenue South
Birmingham, AL 35294
Title: TBA

Maureen A. McCall, Ph.D. (Eldon Geisert, host) November 11, 2008
Professor
Department of Ophthalmology & Visual Sciences
University of Louisville
Louisville, KY 40292
Title: TBA

Robert K. Yu, Ph.D. (Mike McDonald, host) December 9, 2008
Professor
Departments of Neurology, Biochemistry, Molecular & Pediatrics
Medical College of Georgia
Augusta, GA
Title: "Glycobiology of Neural Stem Cells – Functional Implications"

SPRING 2009 SEMINAR SERIES SCHEDULE

Norman R. Relkin, Ph.D., M.D. Host: Alexander Auchus January 13, 2009
Associate Professor
Clinical Neurology and Neuroscience
Weill Cornell Medical College

Title: "Natural Human Antibodies Against Alzheimer's Disease"

Ming Guo, M.D., Ph.D. Host: Jian Zuo January 20, 2009
Assistant Professor
Department of Neurology & Pharmacology
Brain Research Institute
UCLA School of Medicine

Title: "Molecular Paths of Alzheimer's and Parkinson's disease"

Sacha B. Nelson, M.D., Ph.D. Host: Robert Foehring January 27, 2009
Affiliations Faculty: Biology
Department of Biology
Brandeis University

Title: "Physiological Genomics of Cortical Circuits in Health and Disease"

Zhongming Zhao, Ph.D. Host: Lu Lu February 3, 2009
Assistant Professor
Departments of Psychiatry and Human Genetics and Center for the Study of Biological Complexity
Virginia Institute for Psychiatric and Behavioral Genetics
Virginia Commonwealth University

Title: "Schizophrenia candidate gene selection and networks"

Leonardo Belluscio, Ph.D. Host: Matthew Ennis February 17, 2009
Investigator
Developmental Neural Plasticity Unit
National Institutes of Health/ NINDS

Title: "Understanding Neural Circuitry Through Olfactory Maps"

Charles W. Bourque, Ph.D. Host: William Armstrong March 10, 2009
Professor
Departments of Neurology-Neurosurgery and Physiology
The Centre for Neuroscience Research

McGill University

Title: "Feeling hot and thirsty - role of TRPV channels as central sensors of heat and osmolality"

Robert F. Margolskee, M.D., Ph.D. Host: Christopher Nosrat March 24, 2009
Professor
Departments of Physiology & Biophysics and Pharmacology
Mount Sinai School of Medicine
Howard Hughes Medical Institute

Title: "Tasteful receptors and gut feelings: gut-expressed gustducin and sweet taste receptor regulate enteroendocrine functions"

Antonello Bonci, M.D. Host: Shannon Matta April 7, 2009
Professor
Department of Neurology
Ernest Gallo Clinic and Research Center
University of California, San Francisco

Title: "Synaptic plasticity in the mesolimbic system: implications for substance abuse"

Nicole Calakos, M.D., Ph.D. Host: Fu-ming Zhou April 14, 2009
Assistant Professor
Departments of Neurology and Neurobiology
Center for Translational Neuroscience
Duke University Medical Center

Title: "Synaptic and Circuit Basis for OCD-like behaviors in mice"

Eldon Geisert, Ph.D. April 21, 2009
Professor
Departments of Ophthalmology and Anatomy & Neurobiology
UTHSC

Title: "Developing Small Molecules to Treat Glioblastoma: The Serendipity of Discovery"

Edward J. Neafsey, Ph.D. Host: Robert Waters May 5, 2009
Professor
Departments of Cell Biology, Neurobiology and Anatomy & Surgery
Loyola University Stritch School of Medicine
Chicago, IL

Title: "The Neuroprotective Effect of Moderate Ethanol: Epidemiological Review and Possible Mechanisms"

NEUROSCIENCE SYMPOSIUM May 1, 2009
Title: "Brain Mechanisms Underlying Learning and Memory"
Speakers:

Dan Johnston, Ph.D.
Professor and Director
Center for Leaning and Memory
University of Texas, Austin

Wendy A. Suzuki, Ph.D.
Associate Professor
Center for Neural Science
New York University

Ioannis Dragatsis, Ph.D. May 12, 2009
Assistant Professor
Department of Physiology
Director, Transgenic/Knockout Core, Center for Genomics & Bioinformatics
UTHSC

Title: "Familial Dysautonomia, without pain and tears: Generation of a mouse model"

Jeffrey C. Magee, Ph.D. Host: Jason Jerome (student) May 19, 2009
Group Leader
Janelia Farm Research Campus
Howard Hughes Medical Institute
Ashburn, VA

Title: "Dendritic Integration and Plasticity in Hippocampal Pyramidal Neurons"

APPENDIX 4

Neuroscience News, Events and Graduate Training Flyer

FY 2008-2009

THE UNIVERSITY of TENNESSEE HEALTH SCIENCE CENTER

Neuroscience Symposium

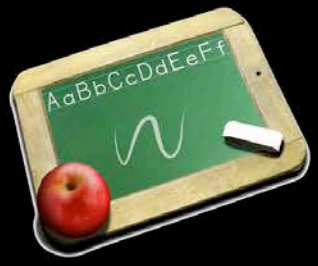
Brain Mechanisms Underlying Learning and Memory

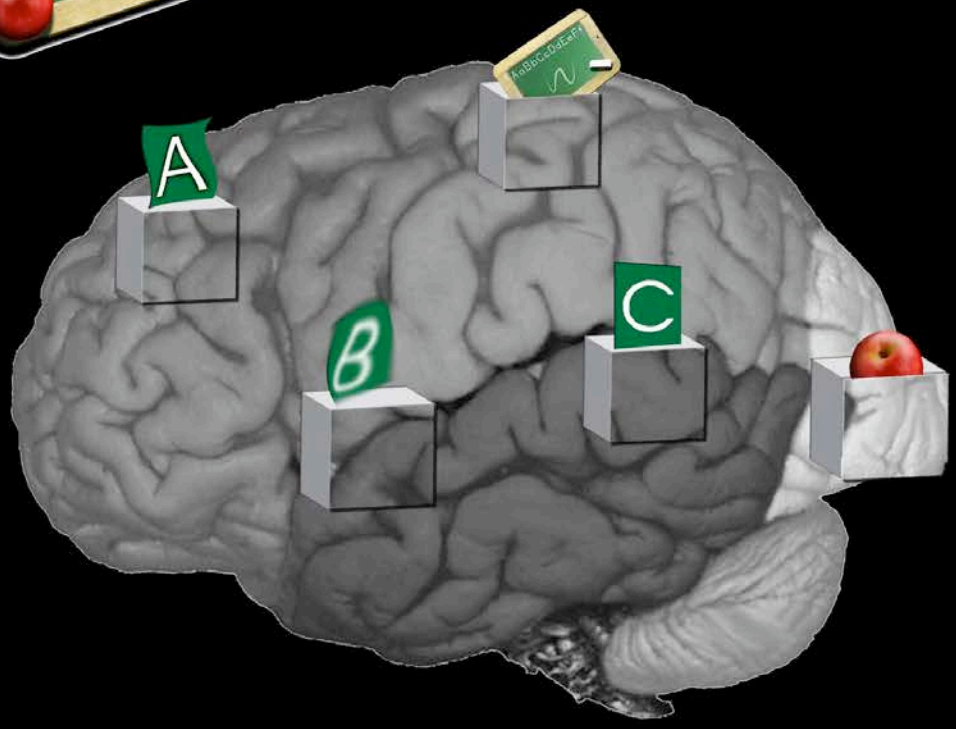
Friday
May 1
1 - 4 PM
Freeman Auditorium
930 Madison

Dan Johnston, Ph.D.
Center for Learning and Memory, University of Texas
"Plasticity of Dendritic Excitability"

Randall J. Nelson, Ph.D.
Anatomy and Neurobiology, UTHSC
"Mistakes Happen: Somatosensory Changes After Failing to Obtain Remembered Goals"

Wendy A. Suzuki, Ph.D.
Center for Neural Science, N ew York University
"Associative Learning Across the Monkey Medial Temporal Lobe"





Sponsored by

THE NEUROSCIENCE INSTITUTE & Anatomy & Neurobiology
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

Please Call 448-5960 for more information


Autism Seminar Series
in Basic and Clinical Research
Speakers
Dr. Ed Cook, M.D.
University of Chicago
Sept. 26th
Dr. James Sutcliffe, Ph.D.
Vanderbilt University
Oct. 24th
Dr. Arthur L. Beaudet, M.D.
Baylor College of Medicine
Dec. 3rd
Dr. Sarah Spence, M.D., Ph.D.
National Institutes of Health
Jan. 23rd
Host
Dr. Lawrence T. Reiter, Ph.D.
Department of Neurology, UTHSC
Location & Time
Le Bonheur Children's Hospital Auditorium
50 N Dunlap St, Memphis, TN
Noon-1pm Lunch Provided (First 100 attendees)
THE NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER
LeBonheur Children's Medical Center
Boling Center for Developmental Disabilities
THE UNIVERSITY of TENNESSEE HEALTH SCIENCE CENTER
CLINICAL & TRANSLATIONAL SCIENCE INSTITUTE


Autism Seminar Series
in Basic and Clinical Research
Speakers
Susan Hyman, M.D.
University of Rochester Medical Center
Feb. 25th
N. Carolyn Schanen, M.D.,Ph.D.
NEMOURS Biomedical Research
Mar. 27th
Suart Shapira, M.D., Ph.D.
Centers for Disease Control and Prevention
Apr. 24th
Sarika Peters, Ph.D.
Baylor College of Medicine
May 22nd
Host
Dr. Lawrence T. Reiter, Ph.D.
Department of Neurology, UTHSC
Location & Time
Le Bonheur Children's Hospital Auditorium
50 N Dunlap St, Memphis, TN
Noon-1pm Lunch Provided
THE NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER
LeBonheur Children's Medical Center
Boling Center for Developmental Disabilities
THE UNIVERSITY of TENNESSEE HEALTH SCIENCE CENTER
CLINICAL & TRANSLATIONAL SCIENCE INSTITUTE

NI Director William Armstrong receives award for Exceptional Meritorius Service from UTHSC and Anatomy and Neurobiology Faculty

HEALTH SCIENCE CENTER

THE RECORD

MARCH – APRIL 2009

Anatomy and Neurobiology Recognized

Dr. Schwab, Dr. Ennis and Chancellor Wall present Dr. Armstrong with a plaque from the Anatomy and Neurobiology department for his dedication and hard work.

On February 5, William Armstrong, PhD, professor in the Department of Anatomy and Neurobiology, and director of the Neuroscience Institute, was honored for his "Exceptional Meritorious Service."

Simultaneously, the entire Anatomy and Neurobiology department was recognized for recent escalation in their NIH funding rank, due in part to the hard work of Dr. Armstrong and his colleagues. He led the department and Neuroscience Institute during the 2007 ranking period.

Although Dr. Armstrong's hard work was no surprise to his colleagues, he was indeed astonished by the recognition from Chancellor Hershel Wall, MD, Steve Schwab, MD, executive dean of the College of Medicine, Matthew Ennis, PhD, Simon R. Bruesch Professor and chair in the

See **Anatomy**, pg. 4

UT Board Meets in Memphis

The University of Tennessee Board of Trustees and five of its committees met on February 25 through 27 at UTHSC's Student-Alumni Center and Freeman Auditorium.

UT Board of Trustee members John Petersen, PhD, Robert Talbott and other members evaluate agenda items at the winter board meeting on February 27.

The Finance and Administration Committee heard details of the proposed budget reductions at each campus and institute on Thursday. The board will approve the final budget and any possible tuition increases at its meeting in June.

Other agenda items included presidential transition, approval of the revised budget, implementation of a voluntary retirement incentive program for UT Institute of Agriculture staff, consolidation of the UT Knoxville College of Social Work, approval of a procedural framework for academic program discontinuance and awarding of honorary degrees.

Webcasts are available at http://www.tennessee.edu/system/budget/. To view further agenda information and supporting materials on topics that were covered during the three-day meeting, please visit http://bot.tennessee.edu/.

CONTENTS:

Petersen Steps Down, Simek Named Acting President

On February 18, UT President John Petersen, PhD and Trustee Vice Chairman Jim Murphy jointly announced that Petersen will resign as president, effective June 30. Jan Simek, PhD, most recently the interim chancellor for UT Knoxville, will be recommended to the Board of Trustees to fill the president's post for up to two years.

John Petersen, PhD

Acting President Jan Simek, PhD

Dr. Petersen will be on administrative leave with pay beginning March 1 through June 30. Dr. Simek will be acting president from March 1 through June 30 and will become interim on July 1. His appointment as interim is not to exceed two years.

"As I approach the end of my fifth year, I have been giving serious thought to my future plans and determined I wanted to leave in June," Dr. Petersen said. "In discussions with Vice Chair Murphy and other board members, we agree that it serves the university's interest best to make the change now so that the person responsible for implementing cuts in next year's budget will be the person leading the difficult budget decisions in the coming months.

See **Petersen**, pg. 4

MISSION STATEMENT

The Health Science Center aims to improve human health through education, research, clinical care and public service. The UT Health Science Center includes colleges of Allied Health Sciences, Dentistry, Graduate Health Sciences, Medicine, Nursing and Pharmacy.

THE UNIVERSITY of TENNESSEE HEALTH SCIENCE CENTER

NI member Dr. Alex Auchus is interviewed regarding his clinical trials for Alzeiheimer's Disease

Clinical Trials to Begin in Memphis For Alzheimer's Treatments

TOM WILEMON | The Daily News


Alexander Auchus

Two new drugs that have the potential to combat the progression of Alzheimer's disease are about to be tested in Memphis through clinical trials.

Existing drugs treat only the symptoms of the disease, said Dr. Alexander Auchus, a professor of neurology and director of Alzheimer's research at the University of Tennessee Health Science Center.

Auchus will oversee the trial of the investigational drug bapineuzumab this year as well as the clinical trial of another study to follow. Volunteers may sign up for the bapineuzumab trial until the end of April.

The drug is intended to target amyloid, a protein deposited in senile plaques in the brains of Alzheimer's patients. It is being developed by Elan Corp. of Dublin, Ireland, and Wyeth, which is based in New Jersey.

Wait and see

Professors from the UTHSC in Memphis and Vanderbilt University in Nashville are taking part in the clinical trial, which will involve 2,050 volunteers at 200 study sites throughout the United States and Canada. The trials should last 18 months, according to a press release issued by Elan.

"We hope that it will be a disease-modifying treatment for Alzheimer's in distinction to existing therapies, which are called symptomatic treatments," Auchus said. "The symptomatic treatments help with the symptoms, but don't really stop the disease process; whereas disease-modifying therapies – and right now there are no disease-modifying therapies for Alzheimer's – if this drug proves to be effective as a disease-modifying therapy, we hope it will stop or slow down the deterioration that is the disease."

The drug will be administered intravenously to study participants every six weeks.

"The bapineuzumab study is actually an antibody against the amyloid, an antibody like the flu vaccine would give a person's immune system the chance to raise antibodies against the virus," he said. "This bapineuzumab is an antibody against the amyloid protein."

Differences of opinion

However, there is debate within the scientific community about whether research to combat the progression of Alzheimer's disease should target the amyloid protein or another protein that helps form neurofibrillary tangles in the brain.

"The plaques are made up of the amyloid," Auchus explained. "The tangles are different. They are made up of a protein called tau. There are differences in the field. In fact, there is a friendly joke that if you favor tau you are a Taoist, and if you favor beta amyloid peptide (BAP), you're a Baptist."

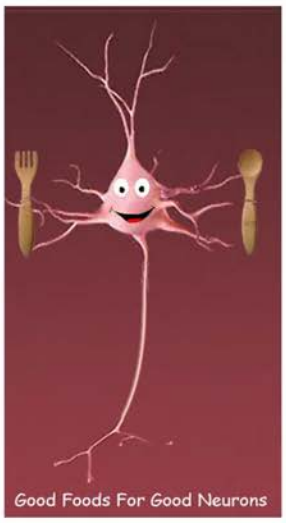
The UTHSC professor said he doesn't want to put himself in either category. The exact cause of Alzheimer's is still being researched.

"We think there are multiple factors involved, including genetics, which aren't even part of the amyloid or tau (debate)," Auchus said. "Age, of course, is the biggest factor for getting Alzheimer's. And some of it is just a matter of the brain's ability to cope with the passage of time."

Volunteers for the bapineuzumab study should be between ages 50 and 88, have a diagnosis of mild to moderate Alzheimer's and have a caregiver who will be involved with the study. Details: Debra Dale, research nurse coordinator, ddale@utmem.edu or 901-271-5968. For information

Michael Antone of Christian Brothers University presents a poster of his undergraduate work sponsored by NI and Dr. Kristen Hamre, at the CBU annual research day, April 21, 2009.

THE
NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER



Brain Awareness Week 2009

Food For Thought: What to Eat For A Better Brain

When

Thursday, March 26, 6:30 – 8:30 pm

Where

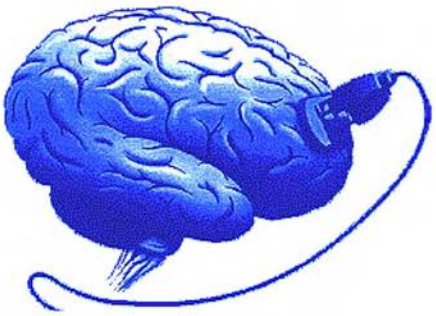
The Urban Child Institute 600 Jefferson Ave.

This program for the general public will feature two presentations by internationally known scientists on the importance of diet for brain development and the maintenance and enrichment of a healthy brain in adulthood. Dr. Patricia Wainwright, a neuroscientist from the University of Waterloo in Canada, will talk about the various ways that proper diet is necessary for the early critical periods of a developing brain and how dietary supplementation might improve brain functioning. Dr. Fernando Gómez-Pinilla, a neuroscientist from the University of California in Los Angles who has said "food is like a pharmaceutical compound that affects the brain," will speak about how food affects the brain and how to utilize diet to enhance mental functioning in the brain. Dr. William E. Armstrong, Director of the University of Tennessee Neuroscience Institute, will moderate the program.

This program is directed toward parents, teachers, and health professionals. Professional training hours (CEUs) will be provided by the UT Neuroscience Institute. For more information, contact Dr. Paul Herron, UT Neuroscience Institute (448-5824). Space is limited. Please pre-register with Ms. Brenda Williams, The Urban Child Institute (526-1822; bwilliams@theurbanchildinstitute.org). Attendance is free.

Refreshments from 5:30-6:30 pm

THE URBAN CHILD INSTITUTE



Plug Into Neuroscience!

commercialappeal.com Wednesday, March 18, 2009 ** A7

COMMENT

GUEST COLUMN

Want a smart baby? Pay attention to food

Daily nutrition may be the single most important factor in children reaching their full brain potential and brain capacity, writes UT professor **PAUL HERRON**.

PAUL HERRON Paul Herron is an associate professor in the Department of Anatomy and Neurobiology at the University of Tennessee Health Science Center.

IMAGINE A CONVERSATION between Mary, who is eight months' pregnant, and Briana, who has a 1-year-old. They are discussing the factors that they think would enable their children to reach their full brain potential and intellectual capacity. Mary says the most important factor is genetics. Briana says it is a stimulating environment. Both are correct, of course, particularly if you combine the two answers. But daily nutrition may be the single most important factor in their children reaching their full brain potential and brain capacity.

Why is nutrition so important? Simply put, the brain requires good nutrition to physically grow to its full potential. The most critical time for brain development and brain growth occurs during the prenatal period and the first few years of life. Studies have shown that the brain produces almost all of its estimated 200 billion brain cells, called neurons, during the prenatal period.

A note of warning: Newly generated neurons are extremely sensitive and very fragile. They can be easily damaged or killed by drugs or excess alcohol ingested by the mother. Substance abuse by the mother during pregnancy knocks babies off track from their full brain potential and cognitive development, before they are born.

After birth, the rapid growth of the brain is a fascinating process. At birth, the head of a baby is about one-fourth the size of an adult's head. The baby's head grows rapidly because the brain grows rapidly. A major reason for the brain growth is the growth of its nerve cells, called neurons, and its support cells, called glial cells. Neurons change dramatically during the postnatal period. They grow extensions, called dendrites, from their body like limbs on a tree. A neuron may have several dendrites with branches. The extensive growth of dendrites creates space for connections, called synapses, from other brain cells.

A second part of the growth is the wiring in the brain. Brain cells have string-like structures, called axons, which make synapses mostly with the dendrites of other neurons. A brain cell has only one axon but once the axon travels to a different brain region, it can branch many times to make many synapses on many neurons. A fatty protein called myelin wraps most axons. The myelin acts as an insulator of the electrical signal in axons and also enables axons to carry information faster.

Thus, the diet of Mary, which also nourishes her baby, and of Briana's 1-year-old can have a big effect on the number of cells created during the prenatal period, the growth of neurons and the number of synapses for learning and memory. Studies and clinical observation have shown that during the prenatal and early childhood period, the brain needs a plentiful supply of proteins and omega-3 fatty acids. Protein deprivation in animals shows that the number of neurons in the part of the brain important for learning and memory is reduced.

The good news is that a plentiful supply of these nutrients can have very good effects. For example, an Australian study found that breast-fed babies have higher IQs in grade school compared with babies that are not breast-fed. Breast milk has a high content of omega-3 fatty acids. Whether omega-3 fatty acids enable neurons to grow bigger and make more synapses for learning and memory is an interesting question.

To understand more about how food affects the brain, the Neuroscience Institute at University of Tennessee Health Science Center and The Urban Child Institute are teaming up to offer a public symposium entitled "Food for Thought: What to Eat for a Better Brain." This program is designed for the general public and will feature two presentations by internationally known scientists on the importance of diet for brain development and the maintenance and enrichment of a healthy brain in adulthood. The first speaker, Dr. Patricia Wainwright, a neuroscientist from the University of Waterloo in Canada, will talk about periods of brain development when it is critical to have a proper diet. She also will discuss how dietary supplementation might enhance brain functioning.

Nutrients from foods also have been reported to affect mood, improve learning and memory, reduce pain, and possibly reduce the effects of brain diseases such as Alzheimer's. The second speaker, Dr. Fernando Gómez-Pinilla, a neuroscientist from the University of California in Los Angles, will speak about how food affects the mature brain and how to utilize diet to enhance mental functioning. Dr. William E. Armstrong, director of the Neuroscience Institute, will moderate the program.

This is one in a series of monthly guest columns designed to focus public attention on issues that affect children. It is part of a Shelby County initiative to remind everyone, in every aspect of daily life, to "Ask First: Is It Good for the Children?" For more information, call the Shelby County Office of Early Childhood and Youth at 526-1822 ext. 249.

NI member and Brain Awareness organizer Paul Herron provides commentary in Commercial Appeal, Mar. 18, 2009

Food choices and exercise can affect brain development

By Barbara Holden
Special to My Life

Most of us know that eating a balanced diet of nutritious foods and exercising regularly is good for your body, but did you know eating well is also good for your brain?

According to Dr. Fernando Gómez-Pinilla, Ph.D, a professor of Neurosurgery and Dept. of Physiological Science at the University of California at Los Angeles, eating well and exercising is important at every age, and it's particularly important for young children because it directly affects the molecules responsible for learning, memory and reading in their rapidly developing brains.

That's easy to understand when you consider that 80 percent of your baby's brain will be developed by the time she's three years old, and will be 90 percent developed by her fifth birthday.

"I would urge parents to avoid junk foods and fast foods as much as possible," Gómez-Pinilla said. "I know those foods are convenient, but those junk food saturated fats and sugars are quite simply bad for the brain."

In other words, if we can reduce the obesity epidemic in this country, we could actually increase our mental functions at the same time.

If you are wondering what foods to eat to have a positive affect on your brain, Gómez-Pinilla says to reach for plenty of brightly colored fruit and veggies, and also protein from fish, which studies show is very good for better brain function.

You can hear Gómez-Pinilla discuss the roles nutrition and exercise play for the developing brain at the University of Tennessee Neuroscience Institute's forum "Food for Thought: What to Eat for a Better Brain" on Thursday at 6:30 p.m. at The Urban Child Institute auditorium. The event is free and open to the public.

Barbara Holden is a director at the Urban Child Institute, a Greater Memphis organization dedicated to promoting early childhood development. The Commercial Appeal is a partner with the Urban Child Institute in this effort to help parents and other care givers learn skills that nurture and educate the minds of infants and children. For more information, go to theurbanchildinstitute.org or dial 211 for the Public Library and Information Center.

Barbara Holden of the Urban Child Institute features the NI Brain Awareness Symposium in her regular column in the Commercial Appeal (March, 2009).

Dr. Gomez-Pinilla, guest speaker for Brain Awareness Symposium, is interviewed by Commercial Appeal on Mar. 26, 2009

Heads-up on healthy brain diet

Prof finds fish, fruit, veggies aid function

By Mary Powers
powers@commercialappeal.com

There's growing evidence that the right diet — the omega-3 fatty acids of salmon, the folic acid of spinach and the antioxidants of blueberries — protects the brain and the heart.

"You cannot see a difference from one day to the next, but there is a concept of cognitive reserve. It is like putting money in the bank. ... A lot of things we do now will be helpful later as we age or when we get sick," explained Dr. Fernando Gomez-Pinilla, a University of California Los Angeles professor of neurosurgery and physiological science.

Fernando Gomez-Pinilla

Gomez-Pinilla is scheduled to be in Memphis today to discuss nutrition and brain health. The free public program is titled, "Food for Thought: What to Eat for a Better Brain."

The event is set for 6:30 p.m. at the Urban Child Institute, 600 Jefferson. Sponsored by the University of Tennessee Neuroscience Institute, it is also scheduled to include Dr. Patricia Wainwright of the University of Waterloo in Ontario.

The July issue of the scientific journal Nature Review Neurosciences includes Gomez-Pinilla's review of 160 animal and human studies into nutrients and brain function.

His conclusions? Eat a modest amount, exercise regularly, get adequate sleep and load up on vegetables, fruits and fish.

"Eating too many calories is like putting too much food into the brain and the excess fuel turns into smog," he explained. "When we eat too many calories the excess turns into free radicals," which damage cells.

Turns out diets high in sugar, saturated and trans fat carry their own risks.

Gomez-Pinilla stopped eating fast food after studying its impact on animals. "We found that the animals got more stupid eating that diet," he said.

The biochemicals that knit brain cells together for efficient learning or memory didn't work as well.

Rodent learning also suffered when the diet lacked adequate levels of omega-3 fatty acid.

— Mary Powers: 529-2383

NI member Michael Dyer receives Howard Hughes Early Scientist Award

St. Jude doctor gets research funds

The Commercial Appeal

A neurobiologist at St. Jude Children's Research Hospital is among 50 scientists early in their careers picked to share $200 million in research funds from a private philanthropy anxious to spur innovation.

Today, the Howard Hughes Medical Institute plans to name Dr. Michael Dyer of St. Jude to participate in its early career scientists program. For Dyer, 40, it means $1.5 million to support his research for the next six years. The grant will also pay his salary and benefits.

"What this gives me is the freedom to take six years and invest in a project that I have no guarantees it is going to work," explained Dyer, who made a splash in 2007 when his laboratory reported the first evidence that mature nerve cells could divide. It was a finding with implications for diseases ranging from Alzheimer disease to childhood cancer.

Dyer said he will likely pursue questions related to development of normal nerve cells as well as the path some of those cells take to become tumors.

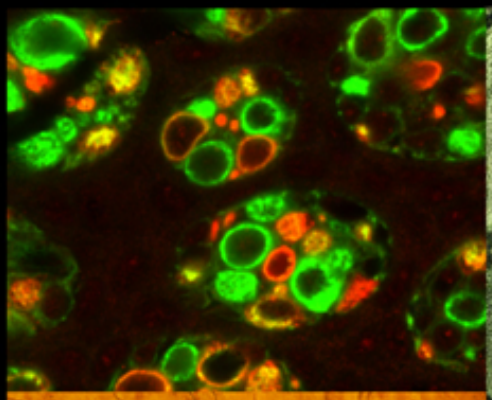
In a statement, Institute officials said the grants are designed to give investigators "the freedom to explore his or her best ideas without worrying about where to find the money to fund those experiments." The institute's headquarters is in the Washington suburb of Chevy Chase, Md.

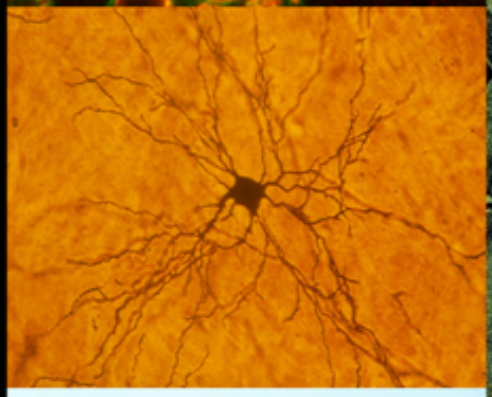
—Mary Powers

THE NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

St. Jude Children's Research Hospital
ALSAC · Danny Thomas, Founder

Graduate Studies in Neuroscience





Neuroscience Studies at the University of Tennessee Health Science Center are a part of a multidisciplinary and interdepartmental program including the Departments of Anatomy and Neurobiology, Molecular Sciences, Pathology, Pharmacology, and Physiology. This program provides a broad background in neuroscience and specific research training in neurochem istry, neurophysiology, neuropharmacology, molecular and cellular neuroscience, developmental neurobiology, and behavioral neuroscience, leading to the Ph.D. degree.

Established in 1985, the multidisciplinary Neuroscience Institute houses over 80 faculty from several departments and colleges at UT. The faculty hold positions in the departments of Anatomy and Neurobiology, Medicine, Molecular Sciences, Neurology, Neurosurgery, Ophthalmology, Pathology, Pharmaceutical Sciences, Pharmacology, Physiology, Sur gery, and Biomedical Engineering. Some faculty members also hold primary appointments at St. Jude Children's Research Hospital, just a short distance away.

UT Neuroscientists focus on research dealing with neurological and neurodegenerative disorders, excitable properties of neurons and synaptic function, sensory information processing, brain tumor biology, vision and retinal biology, neurogenetics and neural development, neuropharmacology of mental and addictive disorders, and intracellular signaling in neu rons. UTHSC is one of the world's leading centers exploiting novel genomic approaches to explore brain development, CNS function and behavior, and psychiatric and neurodegenerative diseases.

Graduate Studies in Neuroscience

To apply for the Neuroscience Track, please go to the Integrated Program in Biomedical Science (IPBS) website.

http://www.utmem.edu/grad/IPBS

To find out more about the program, please visit our website.

http://www.utmem.edu/neuroscience

THE UNIVERSITY of TENNESSEE
HEALTH SCIENCE CENTER

APPENDIX 5

Call for Applications

Basic and Clinical Neuroscience Pilot Grants

Postdoctoral Research Awards

THE
NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

Neuroscience Institute (NI) Pilot Program For Clinical Neuroscience

Goal: The NI solicits the submission of proposals from clinical neuroscientists for funds to collect pilot data for grant applications to NIH.

Method of Support by NI: The NI will primarily provide funds for support personnel (*i.e.*, technicians, coordinators, students, post-docs, etc.) or a crucial piece of equipment, and some additional funds for supplies. A progress report must be submitted after each year of funding, and "UTHSC Neuroscience Institute/Center of Excellence" acknowledged in any publications relevant to support. These publications should be forwarded to NI.

NI Funding Levels: Individuals may request up to $50,000 for the first year of support. The amount awarded will depend on the budget justification and the number of quality applications. A second year of support will be determined by the progress report (including peer review) and availability of funds.

NI Application for Support:

1. Two page application that identifies the PI and other key personnel, a brief description of the project and its current status (*e.g.*, is the project nascent, or is their a grant in submission, revision, etc.) and the intended or current category of application (R01, R21, R34, etc.).
2. *The project should include at least one basic scientist co-investigator with strong research experience.* The Pi and each investigator involved in the project should supply an NIH format biosketch that includes current any current or previous funding.
3. Itemized budget with justification.

Review Process: The NI will review applications and make awards on a meritorious basis. A brief, written summary will be sent to the corresponding PI.

Deadline: Mar. 21, 2008. Submit electronic (PDF) copies to:

William Armstrong, Ph.D.
Director, Neuroscience Institute
Email: warmstrong@utmem.edu
Phone: 901-448-5966

THE NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

Neuroscience Institute (NI) Pilot Program For Collaborative Grant Applications

Goal: The NI solicits the submission of proposals for collaborative, multidisciplinary neuroscience research. Such grant applications may involve 3 or more investigators who plan to submit an application for an NIH PPG, NIH Center, or similar research ensemble (*e.g.,* large R01 with non-modular budgets of >$350,000/yr) focused on a coherent research theme. The PI and at least one collaborator must have active NIH funding.

Method of Support by NI: The NI will primarily provide funds for personnel or a crucial piece of equipment, and some additional funds for supplies. Support will be for a maximum of 2 years for any one group. A progress report must be submitted after each year of funding, and "UTHSC Neuroscience Institute/Center of Excellence" acknowledged in any publications relevant to support. These publications should be forwarded to NI.

Types of Grant Application Eligible for Consideration of NI Support:

1. Preliminary: Committed research team of established PIs who meet NIH criteria for a successful application; early stage grant hypotheses/concepts and committed funding from the research team to obtain preliminary data;
2. Advanced: NIH Institute indicates a commitment to the grant and to a level of NIH funding that can be requested by the applicants;
3. An Advanced Concept with a first set of positive critiques from an NIH review panel requesting additional preliminary data prior to resubmission.

NI Funding Levels: Groups may request up to $40,000 for the first year of support. The amount awarded will depend on the budget justification and the number of quality applications. A second year of support will be determined by the progress report (including NIH review) and availability of funds.

NI Application for Support:

1. Two page application that identifies the PI and other key personnel, a brief description of the project and its current status (*e.g*., preliminary, advanced, etc), and the intended category of application (*e.g*., large R01, P01, P30, P50).
2. Each investigator involved in the project should also supply a current NIH format biosketch that includes current funding.
3. Itemized budget with justification.
4. For advanced concept (#3 above), the NIH review should be submitted with application.

Review Process: The NI Executive Committee will review applications; a brief, written summary will be sent to the corresponding PI.

Deadline: Jan. 14, 2008. More submission dates may be announced in early 2008. Submit electronic (PDF) copies to:

William Armstrong, Ph.D.
Director, Neuroscience Institute
Email: warmstrong@utmem.edu
Phone: 901-448-5966

THE NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

Neuroscience Institute (NI) Postdoctoral Research Support

Purpose and Eligibility: The NI solicits proposals for matching funds from postdoctoral fellows or research associates whose mentors are members of NI. Mentors should be currently funded or working on a no-cost extension of a competitively renewable grant. Postdocs or research associates whose mentors are currently receiving NI pilot project money are ineligible for this award.

Support: The NI will provide $15,000 matching funds, to be used toward the salary/fringe of each awarded applicant for FY 2010. We anticipate making 5 awards.

Application for Support:

1. The applicant should provide a cover letter requesting support with a brief summary of current research projects. A current CV should be attached to the cover letter. These documents should be submitted electronically as PDF files.
2. The applicant should request two letters of reference, one of which must come from the mentor. mentor's reference letter should also identify the source of matching funds for the applicant. Reference letters may be emailed. The mentor's letter should have an NIH style biosketch attached.

Review Process and Criteria: The NI Executive Committee will review applications. Criteria will include evidence of productivity in neuroscience research, with value attached to first author publications.

Deadline: **July 15, 2009**. Awards will be retroactive from July 1, 2009-June 30, 2010.

Submission: Please send all materials electronically to:

Michele Garr, Administrative Assistant
Neuroscience Institute
mgarr@utmem.edu
Phone: 448-2684