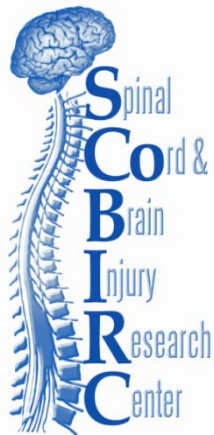




**2008 PROGRESS REPORT FOR THE
SPINAL CORD AND BRAIN INJURY RESEARCH CENTER (SCoBIRC)
UNIVERSITY OF KENTUCKY MEDICAL CENTER**



**SUBMITTED TO JAMES SHAUGHNESSY, DDS, CHAIRMAN,
Kentucky Spinal Cord and Head Injury Research Trust Board
And
Jay A. Perman, M.D., Dean and Vice President for Clinical Affairs
University of Kentucky College of Medicine**

JANUARY 31, 2009

EDWARD D. HALL, PH.D., SCoBIRC DIRECTOR

This report describes our progress in achieving the goals for 2008 outlined in the 2007 Progress Report. Also presented are related SCoBIRC activities including the Invited Lecture Series, a full listing of publications, new grants and honors/awards for SCoBIRC Faculty and Faculty Associates. Lastly, we present the main SCoBIRC goals for 2009.

HIGHLIGHTS OF 2008

- Funding by the National Institute of Neurological Disorders & Stroke (NINDS) of the Cyclosporine A Severe TBI (CASTBI) Phase III Clinical Trial Planning Grant (PI: **SCoBIRC Clinical Director, Dr. Byron Young**) followed by submission of full clinical trial R01 to NINDS in June, 2008.
- Promotion and Appointment of **new SCoBIRC Core Research Faculty Member Diane M. Snow, Ph.D.**, as SCoBIRC #7 Endowed Professor of Anatomy & Neurobiology.
- Appointment of **new SCoBIRC Faculty Associate: Lumy Sawaki, M.D.**, Cardinal Hill Endowed Associate Professor of Physical Medicine and Rehabilitation.
- Promotion of SCoBIRC Faculty Associate **Franca Cambi, M.D.** to Professor of Neurology. Dr. Cambi holds SCoBIRC Endowed Chair #5.
- SCoBIRC faculty obtained \$3,018,942 in new multi-year extramural grant support from NIH, KSCHIRT and private foundations.
- Graduation of 3 Ph.D.s from SCoBIRC laboratories: **Laurie M. Davis, Ph.D.**, **Lamin H. Mbye, Ph.D.** and **Yiqin Xiong, Ph.D.**
- Recruitment of 3 new graduate students into SCoBIRC laboratories: **Shaun Carlson, Kathleen Schoch and Dexter Reneer.**
- Recruitment of 3 new post-doctoral fellows into SCoBIRC laboratories: **Theresa C. Thomas, Ph.D.** (Lifshitz Laboratory), **Paula Heron, Ph.D.** (Snow Laboratory) and **Haiyan Zhu, Ph.D.** (Cambi Laboratory).
- SCoBIRC Faculty, Faculty Associates and Predoctoral/Postdoctoral Trainees have published 42 full CNS injury-related publications and delivered 19 invited lectures/seminars.
- SCoBIRC Director **Edward D. Hall, Ph.D.** named to National Spinal Cord Injury Association SCI Hall of Fame.
- SCoBIRC Core Faculty Member **Diane M. Snow, Ph.D.** selected by Kentucky Academy of Sciences as Distinguished Kentucky University Scientist of 2008.

2. PROGRESS ON SCoBIRC GOALS for 2008

GOAL 1: RECRUIT ADDITIONAL FACULTY

New Core Faculty: Diane M. Snow, Ph.D., has moved into the SCoBIRC Core Faculty and laboratory space in the 4th floor of the Biomedical & Biological Sciences Research Building (BBSRB). Dr. Snow brings increased neuronal cell culture and axonal regeneration expertise into the SCoBIRC Core.

New SCoBIRC Faculty Associates: Lumy Sawaki, M.D. joined the Department of Physical Medicine & Rehabilitation as Cardinal Hill Endowed Professor and SCoBIRC as a Faculty Associate this past spring. She is pursuing clinical research aimed at improved neurorehabilitative strategies for spinal cord injury and stroke patients in her newly renovated laboratory space at Cardinal Hill Rehabilitation Hospital.

Core Faculty Recruitment: Concerning our goal to fill our last SCoBIRC Core Faculty position (# 9), we are still interviewing candidates with a high priority on spinal cord regeneration research as the target area.

Dr. Byron Young, SCoBIRC Clinical Director, recently received a major gift from a grateful patient that is being used to match the \$500,000 SCoBIRC Endowed Professorship #8 (funded by KSCHIRT in 2006) to create a new Endowed Chair to be used to recruit another senior (Associate or Full Professor) TBI-focused scientist to the Department of Neurosurgery and to SCoBIRC. This recruitment is also ongoing.

Updated Listing of SCoBIRC Core Faculty and Faculty Associates:

The following is an updated listing of our SCoBIRC Core Faculty and Faculty Associates including their research interests.

SCoBIRC Regular Title Series Core Faculty:

- **Edward D. Hall, Ph.D.**, Director and SCoBIRC #4 Endowed Professor of Anatomy & Neurobiology, Neurology and Neurosurgery; *Reactive oxygen and cytoskeletal damage mechanisms in acute CNS injury; pharmacological neuroprotection*
- **James W. Geddes, Ph.D.**, Associate Director and Admiral Sheeley Endowed Professor of Anatomy & Neurobiology; *Cytoskeletal disruption following neuronal insult and calpain as a therapeutic target for spinal cord injury and blast-induced traumatic brain injury*
- **Patrick G. Sullivan, Ph.D.**, Associate Director and SCoBIRC #3 Endowed Associate Professor of Anatomy & Neurobiology; *Mechanisms and role of mitochondrial dysfunction in CNS injury*
- **George M. Smith, Ph.D.**, SCoBIRC #2 Endowed Professor of Physiology; *Cellular and molecular mechanisms involved in CNS axonal regeneration; gene therapy of spinal cord injury*
- **Diane M. Snow, Ph.D.**, SCoBIRC #7 Endowed Professor of Anatomy & Neurobiology; *Neuronal outgrowth inhibitory molecules, specifically chondroitin sulfate proteoglycans (CSPGs) during development and following CNS injury*
- **Alexander (Sasha) G. Rabchevsky, Ph.D.**, SCoBIRC #1 Endowed Associate Professor of Physiology; *Interventions to enhance functional recovery and reduce tissue damage following spinal cord injury; role of microglia in modulation of regeneration; mechanisms of autonomic dysreflexia*
- **Kathryn E. Saatman, Ph.D.**, SCoBIRC #6 Endowed Associate Professor of Physiology and Neurosurgery; *Cytoskeletal damage mechanisms in acute brain injury; pathobiology of traumatic axonal injury*

- **Jonathan Lifshitz, Ph.D.**, Assistant Professor of Anatomy & Neurobiology; *Mechanisms and the discovery of potential neuroprotective and neurorestorative treatment strategies related to disruption of brain functional circuits in mild to moderate traumatic brain injury*
- **Jinhui Chen, M.D., Ph.D.**, Assistant Professor of Anatomy & Neurobiology; *Modulation of neurogenesis in the injured brain.* **Note:** we regret to report that Dr. Chen has now left SCoBIRC to accept a faculty position with the Spinal Cord & Brain Injury Research Group at Indiana University working under their Director, Dr. Xiao-Ming Xu, formally of the University of Louisville-Kentucky Spinal Cord Injury Research Center. However, we wish him all the best in his new position and we are hopeful that we will be able to engage in collaborative interactions with Dr. Chen and his new Hoosier colleagues in the future.

SCoBIRC Research Title Series Core Faculty

- **Ying Jin, Ph.D.**, Research Assistant Professor of Physiology; *Neuronal transplantation for repair and recovery after spinal cord injury*
- **Stephen M. Onifer, Ph.D.**, Research Assistant Professor of Anatomy & Neurobiology; *Pharmacological protection of oligodendroglia and myelin in acute spinal cord injury*
- **Indrapal N. Singh, Ph.D.**, Research Assistant Professor of Anatomy & Neurobiology; *Roles of mitochondrial dysfunction and lipid mediators in post-traumatic neurodegeneration*
- **Chen-Guang Yu, Ph.D.**, Research Assistant Professor of Anatomy & Neurobiology; *Neuroprotective effects of calpain inhibitors in spinal cord injury and role of signal transduction mechanisms*

SCoBIRC Faculty Associates

- **Richard D. Andreatta, Ph.D.**, Assistant Professor of Rehabilitation Sciences; *Neurophysiology of orofacial dysfunction after traumatic brain injury*
- **Michael T. Bardo, Ph.D.**, Professor of Psychology, *Behavioral neuropharmacology and operant conditioning*
- **D. Allan Butterfield, Ph.D.**, Professor of Chemistry; *Oxidative damage mechanisms and their inhibition in acute neurotrauma and neurodegenerative disease.*
- **Franca Cambi, Ph.D., M.D.**, SCoBIRC #5 Endowed Professor of Neurology, *Neurogenetics and mechanisms of demyelination in SCI and spinal cord disease*
- **Rodney P. Guttman, Ph.D.**, Associate Professor of Physiology; *Role of calpain in post-traumatic pathophysiology and design of novel calpain inhibitory strategies*
- **Jimmi Hatton-Kolpek, Pharm. D.**, Professor and Chair of Pharmacy Practice; *Organization, design and monitoring of traumatic brain and spinal cord injury trials; clinical pharmacokinetics of neuroprotective agents*
- **Walter High, Ph.D.**, Cardinal Hill Endowed Associate Professor of Physical Medicine & Rehabilitation and Neurosurgery; *Assessment of neurorehabilitation outcomes after traumatic brain injury and clinical trial design*
- **Patrick H. Kitzman, Ph.D., PT.**, Associate Professor of Rehabilitation Sciences; *Neuronal plasticity and treatment of spasticity following spinal cord injury.*
- **Gerald V. Klim, D.O.**, Associate Professor of Physical Medicine & Rehabilitation Sciences; *Rehabilitation after traumatic brain injury and role of pituitary dysfunction in post-TBI impairment*

- **Terry R. Malone, Ed.D., PT**, Professor of Rehabilitation Sciences; *Sports medicine and rehabilitation strategies after orthopedic injuries*
- **Susan M. McDowell, M.D.**, Assistant Dean and Associate Professor of Physical Medicine & Rehabilitation; *Rehabilitation after spinal cord injury*
- **Melanie M. McEwen, Ph.D.**, Research Assistant Professor of Physical Medicine & Rehabilitation; *Development of novel methods for assessing motor recovery in spinal cord injury models*
- **Kimberly Nixon, Ph.D.**, Assistant Professor of Pharmaceutical Sciences; *Neurodegenerative mechanisms associated with alcohol intoxication and alcoholism*
- **James R. Pauly, Ph.D.**, Associate Professor of Pharmaceutical Sciences; *Pharmacological neuroprotection and cognitive enhancement following traumatic brain injury*
- **Mark A. Prendergast, Ph.D.**, Associate Professor of Psychology; *Investigation of neurodegenerative mechanisms in organotypic slice cultures including alcohol-induced brain damage*
- **Sara S. Salles, D.O.**, Assistant Professor of Physical Medicine & Rehabilitation; *Rehabilitation after spinal cord injury*
- **Lumy Sawaki, M.D.**, Cardinal Hill Endowed Associate Professor of Physical Medicine & Rehabilitation; *Novel methods to improve neurorehabilitation in spinal cord injury and stroke patients.*
- **Stephen W. Scheff, Ph.D.**, Professor of Anatomy & Neurobiology; *Synaptic plasticity and recovery of function following traumatic brain injury and spinal cord injury*
- **Joe E. Springer, Ph.D.** Cardinal Hill Chair and Professor of Physical Medicine & Rehabilitation; *Apoptotic cell death in traumatic spinal cord injury and neurorehabilitation research*
- **Karin R. Swartz, M.D.**, Assistant Professor of Neurosurgery; *Gender differences and inflammatory mechanisms in the pathophysiology of acute SCI*
- **S. Randal Voss, Ph.D.**, Professor of Biological Sciences; *Microarray analysis of gene expression during amphibian spinal cord regeneration*
- **Byron Young, M.D.**, SCoBIRC Clinical Director and Professor of Neurosurgery; *Clinical trials in traumatic brain injury; cyclosporine A treatment of human TBI*
- **Kathleen M. Youse, Ph.D.**, Assistant Professor of Rehabilitation Sciences; *Communication disorders following human TBI*

GOAL 2: RECRUIT ADDITIONAL POSTDOCTORAL RESEARCHERS AND GRADUATE STUDENTS

New Ph.D. Graduates:

Lamin Han Mbye, Ph.D., May, 2008 (Edward D. Hall, Ph.D., Major Advisor) - currently a postdoctoral fellow in the laboratory of Dr. Michael Whalen, Harvard University Medical School

Yiqin Xiong, Ph.D., July, 2008 (Edward D. Hall, Ph.D., Major Advisor) – currently a postdoctoral fellow in the laboratory of Dr. CP Chang, Stanford University School of Medicine

Laurie M. Davis, Ph.D., October, 2008 (Patrick G. Sullivan, Ph.D., Major Advisor) – currently a first year medical student at the St. George's University School of Medicine, Grenada

New Graduate Students:

Dexter Reneer, laboratory of Dr. James W. Geddes

Kathleen Schoch, laboratory of Dr. Kathryn E. Saatman

Shaun Carlson, laboratory of Dr. Kathryn E. Saatman

New Post-doctoral Fellows:

Theresa C. Thomas, Ph.D., laboratory of Dr. Jonathan Lifshitz

Paula Heron, Ph.D., laboratory of Dr. Diane Snow

Haiyan Zhu, Ph.D., laboratory of Dr. Franca Cambi

GOAL 3: CONTINUE TO BUILD EXTRAMURAL FUNDING BASE

New Grants Received in 2008: SCoBIRC faculty received a total of \$2,545,748 in new single or multi-year grants in 2008.

Cambi, Franca: European Leukodystrophy Association (ELA); *"PLP/DM20 alternative splicing: studies on regulatory sequences, splicing factors and mutations affecting splicing in PMD patients"*; 12/1/2008-11/30/10; Direct costs: \$169,000.

Geddes, James W. The Paralysis Project of America; *"Calpain knockdown to minimize damage and deficits following SCI"*; 7/1/08-6/31/09. Direct Costs \$50,000

Geddes, James W. Kentucky Spinal Cord and Head Injury Research Trust 7-5; *"Implications of High Neuronal Cyclophilin D Levels for Spinal Cord Injury"*; 1/15/2008-1/14/2011; Direct costs: \$275,920

Jin, Ying. The Paralysis Project of America; *"Directing axons regeneration after spinal cord injury"*. 6/01/08-5/31/09; Direct costs \$49,880.00.

Lifshitz, Jonathan. Kentucky Spinal Cord and Head Injury Research Trust 7-11 *"Somatosensory Circuit Disruption and Rehabilitation after Diffuse Brain Injury"*; 1/15/2008 – 1/14/2011; Direct costs: \$275,713

Saatman, Kathryn E. Kentucky Spinal Cord and Head Injury Research Trust 7-20 *"Neuroprotective efficacy of regionally targeted IGF-1"*, 1/15/2008-1/14/2011; Direct costs: \$272,840

Smith, George M. National Institute of Health/ NINDS R01 NS060784, P.I.; *"Reconstruction of the Nigrostriatal Pathway"*; 01/01/09 – 12/31/13; Direct costs \$1,250,000

Springer, Joe E. Kentucky Spinal Cord and Head Injury Research Trust 7-23; *"Therapeutic potential of NEU2000, a dual acting pharmacological agent in the treatment of acute spinal cord injury"*, 1/15/2008-1/14/2011, Direct costs \$272,103

Young, Byron and Hatton-Kolpek, Jimmi. National Institute of Health/NINDS 1R34NS056635; *"CASTBI Trial Planning Grant: Cyclosporine A in Severe Traumatic Brain Injury"*; 01/01/08-

12/31/08; Direct costs \$130,000.

Yu, Chen-Guang and Geddes, James W. Kentucky Spinal Cord and Head Injury Research Trust 7-6A; *"Inhibition of ERK1/2 Signaling Following Spinal Cord Injury"*; 1/15/2008-1/14/2011; Direct costs: \$273,486

Total Direct Costs for New 2008 grants: \$3,018,942

GOAL 4: PURSUE OPPORTUNITIES FOR BASIC-CLINICAL TRANSLATION

As noted above, SCoBIRC Clinical Director Dr. Byron Young was awarded during early 2008 an NINDS Clinical Trial Planning Grant to develop a multi-center phase III clinical trial to evaluate the neuroprotective efficacy of CsA in severe TBI. This is SCoBIRC's first successful therapeutic discovery→clinical translational success story that began in the mid-late 1990s with the demonstration by SCoBIRC faculty Patrick Sullivan and Stephen Scheff of the neuroprotective properties of cyclosporine A in rodent models of TBI. This work in turn inspired an initial Phase II study of the safety, pharmacokinetics and preliminary efficacy of the drug in severe TBI patients by Drs. Byron Young and Jimmi Hatton-Kolpek. The first submission of the phase III NIH grant was made in June. After a constructive first review in the fall, the grant is currently being revised for resubmission.

GOAL 5: HOST 2008 SCoBIRC INVITED LECTURE SERIES

Thanks to the generous KSCHIRT support, we hosted 12 speakers in 2008. In addition, we hosted the 14th Annual KSCHIRT Symposium (see **Appendix I** for program details). We have also filled most of our monthly seminar slots through June, 2009.

2008 SCoBIRC Seminar Schedule (* Faculty Candidate)

***January, 10th:** Keith N. Fargo, Ph.D., Postdoctoral Fellow, Department of Cell Biology, Neurobiology and Anatomy, Neuroscience Program. Loyola University Chicago Stritch, Maywood, IL. *"Androgenic Steroids and Structural Plasticity of Motoneuron Axons and Dendrites"*

February 7th: Mayumi Prins, Ph.D., Assistant professor in Residence, Department of Surgery/Neurosurgery, David Geffen School of Medicine at UCLA, Los Angeles, CA. *"TBI During Development: Metabolism and Plasticity"*

***February 8th:** Jian Zhong, Ph.D., Assistant professor, Neuroscience Center, University of North Carolina at Chapel Hill, Chapel Hill, NC. *"Genetic Dissection of the Raf-Mek-Erk Signaling Pathway in Nervous System Development"*

March 6th: Vittorio Gallo, Ph.D., Wolf-Pack Chair in Neuroscience, Professor Pediatrics, Pharmacology and Physiology, Director, Center for Neuroscience Research, Children's Research Institute, Children's National Medical Center, Washington, DC. *"Glial development and glial regeneration in the mammalian central nervous system"*

March 31st: Geoffrey T. Manley, M.D., Ph.D., Professor of Neurological Surgery, Chief of Neurotrauma, San Francisco General hospital, Co-Director, UCSF Brain and Spinal Injury

Center, University of California, San Francisco. *“Aquaporins in the Central Nervous System: From Molecular mechanisms of Water Transport to Human Disease”*

April 3rd: Matt S. Ramer, Ph.D., Associate Professor (Zoology/Neurosurgery), British Columbia Neurotrauma Fund Chair, Michael Smith Foundation for Health Research Senior Scholar, The University of British Columbia, Vancouver BC Canada. *“Surprising roles for neurotrophins and their receptors in plasticity and regeneration in the spinal cord”*

May 1st: Theodore Hagg, M.D., Ph.D., Endowed Chair, Professor of neurological Surgery, Kentucky Spinal Cord Injury Research Center, University of Louisville School of Medicine, Louisville, KY. *“Targeting the Vasculature for neuroprotection after Spinal Cord Injury”*

June 12-13: KSCHIRT Symposium, Embassy Suites, Lexington KY (see **Appendix I**)

August 14th: Jennifer Forman, University of Kentucky Trauma Outreach Coordinator, Emergency and Trauma Services, University of Kentucky Chandler Medical Center, Lexington, KY. *“Think First – Brain and Spinal Cord Injury Prevention Program”*

September 11th: Randal E. Schleenbaker, Associate Professor, Department of Physical Medicine and Rehabilitation, University of Kentucky Medical Center, Chief, Physical Medicine and Rehabilitation, VA Medical Center. *“Traumatic Brain Injury the Signature Injury for the Iraq War”*

October 9th: Raymond Colello, Ph.D., Associate Professor, Department of Anatomy and Neurobiology, Medical College of Virginia Campus, Virginia Commonwealth University, Richmond, VA. *“Traumatic Injury to the CNS: Exploring methods to facilitate the innate repair response”*

October 23rd: Julia M. Edgar, Ph.D., MS Society Junior Research Fellow/Lecturer, Applied Neurobiology Group, Division of Cell Sciences, Institute of Comparative Medicine, University of Glasgow Veterinary School, Glasgow, UK. *“A role for the oligodendrocytes in supporting the myelinated axon: implications for demyelinated axons”*

November: No Seminar Scheduled due to Society for Neuroscience Meeting, Washington, D.C.

December 11th: Ronald L. Hayes, Ph.D., Clinical Programs Director, Co-Founder and Chairman, Board of Directors Distinguished Research Fellow, Center of Innovative Research, (For Banyan Biomarkers, Inc.), Alachua, FL. *“Assessment of Clinical Utility of Biomarkers of TBI”*

GOAL 6: DEVELOP PUBLIC RELATIONS MATERIALS STRATEGY

During the past year, we have taken steps to improve our Public Relations for the ultimate purpose of increasing our funding base. In the past year, we revised our SCoBIRC tri-fold handout for distribution at various sites (e.g. hospitals, doctor’s offices, etc.). SCoBIRC Core Faculty Member Dr. Jonathan Lifshitz took on the role of SCoBIRC Public Relations Director and greatly improved and updated our SCoBIRC website (www.mc.uky.edu/scobirc) and liaised effectively with the Brain Injury Association of Kentucky to which he has been appointed a member of the BIAK Regular Board Member. In addition, Associate Director Dr. Patrick G. Sullivan is a Regular Executive Board Member and SCoBIRC Director, Dr. Edward D. Hall, is an Honorary Board Member. SCoBIRC Core Faculty Member Dr. Stephen M. Onifer continues to work closely with the Friends for Michael, Inc. Spinal Cord Injury Organization which has generously assisted SCoBIRC with a donation of \$5,000 in 2008. Finally, we hosted a SCoBIRC Open House held in April, 2008 which was attended by State Senator

Tim Shaughnessy, the legislative father of the Kentucky Spinal Cord & Head Injury Research Trust (KSCHIRT) and Dr. James Shaughnessy, Chairman of KSCHIRT.

GOAL 7: CONTINUE FUNDRAISING EFFORTS

Although SCoBIRC has enjoyed considerable success in competing for extramural research funding over the past 6 years, it has had difficulty in obtaining significant private support. During the last year, SCoBIRC Director Dr. Hall has allied SCoBIRC with the Kentucky Neuroscience Institute, headed by SCoBIRC Clinical Director Dr. Byron Young to pursue a more coordinated basic science-clinical fundraising effort. Dr. Young, Dr. Hall and other UK College of Medicine neuroscience leadership are now working together with the UK College of Medicine Development Office to more effectively pursue private donors to support the expansion of UK neuroscience research and clinical treatment initiatives.

3. SCoBIRC GOALS for 2009

GOAL 1: RECRUIT ADDITIONAL FACULTY

We will continue to try to fill our last SCoBIRC Core Faculty position (# 9) this year. Our priority is to recruit an experienced scientist who works in the SCI regeneration/plasticity arena if possible. In addition, as noted above, we are currently recruiting an endowed associate or full professor level TBI scientist in conjunction with the Department of Neurosurgery.

GOAL 2: RECRUIT ADDITIONAL POSTDOCTORAL RESEARCHERS AND GRADUATE STUDENTS

We will continue to recruit promising graduate students and post-doctoral fellows who are interested in careers in neurotrauma research into SCoBIRC laboratories. We very much appreciate the continued annual investment from KSCHIRT for pre- and post-doctoral fellowship support. Moreover, our NINDS T32 Training Grant has also increased our training opportunities.

GOAL 3: CONTINUE TO BUILD EXTRAMURAL FUNDING BASE

We will continue to work to build and/or at least maintain our extramural funding base. Several NIH submissions are under review. We have just received word that we will receive 2 new KSCHIRT grants in early 2009 in addition to the ones listed above.

GOAL 4: PURSUE OPPORTUNITIES FOR BASIC-CLINICAL TRANSLATION

SCoBIRC Clinical Director Dr. Byron Young will be leading an effort that includes several other SCoBIRC faculty (Hatton-Kolpek, Springer, Hall) to create the organization of a Phase III clinical trial of cyclosporine A in severe TBI patients. As noted above, this is funded by an NINDS Clinical Trial Planning grant. Besides the University of Kentucky, the trial will include as many as 50 different sites including the University of Kentucky and the University of Louisville. The phase III trial grant will be resubmitted this spring which we believe has an excellent chance of being funded.

GOAL 5: HOST SCoBIRC INVITED LECTURE SERIES

We will continue to host the monthly SCoBIRC Seminar Series in 2009.

GOAL 6: FURTHER IMPROVE PUBLIC RELATIONS AND FUNDRAISING EFFORTS

We will continue the same PR and fundraising efforts we began in 2008 which we believe will bear fruit.

2008 Neurotrauma-Related Publications Authored by SCoBIRC Faculty (42)

- Ansari MA, Keller JN, **Scheff SW** (2008a) Protective effect of Pycnogenol in human neuroblastoma SH-SY5Y cells following acrolein-induced cytotoxicity. *Free Radic Biol Med* 45:1510-9
- Ansari MA, Roberts KN, **Scheff SW** (2008b) A time course of contusion-induced oxidative stress and synaptic proteins in cortex in a rat model of TBI. *J Neurotrauma* 25:513-26
- Ansari MA, Roberts KN, **Scheff SW** (2008c) Oxidative stress and modification of synaptic proteins in hippocampus after traumatic brain injury. *Free Radic Biol Med* 45:443-52
- Badugu R, Garcia M, Bondada V, Joshi A, **Geddes JW** (2008) N terminus of calpain 1 is a mitochondrial targeting sequence. *J Biol Chem* 283:3409-17
- Barron S, Mulholland PJ, Littleton JM, **Prendergast MA** (2008) Age and gender differences in response to neonatal ethanol withdrawal and polyamine challenge in organotypic hippocampal cultures. *Alcohol Clin Exp Res* 32:929-36
- Butler TR, Smith KJ, Self RL, Braden BB, **Prendergast MA** (2008) Sex differences in the neurotoxic effects of adenosine A1 receptor antagonism during ethanol withdrawal: reversal with an A1 receptor agonist or an NMDA receptor antagonist. *Alcohol Clin Exp Res* 32:1260-70
- Cothron KJ, Massey JM, **Onifer SM**, Hubscher CH (2008): Identification of penile inputs to the rat gracile nucleus. *American Journal of Physiology* 294:R1015-1023.
- Curinga G, **Smith GM** (2008) Molecular/genetic manipulation of extrinsic axon guidance factors for CNS repair and regeneration. *Exp Neurol* 209:333-42
- Davis LM, **Pauly JR**, Readnower RD, Rho JM, **Sullivan PG** (2008a) Fasting is neuroprotective following traumatic brain injury. *J Neurosci Res* 86:1812-22
- Davis LM, Rho JM, **Sullivan PG** (2008b) UCP-mediated free fatty acid uncoupling of isolated cortical mitochondria from fasted animals: correlations to dietary modulations. *Epilepsia* 49 Suppl 8:117-9
- Deng-Bryant Y, **Singh IN**, Carrico KM, **Hall ED** (2008) Neuroprotective effects of tempol, a catalytic scavenger of peroxynitrite-derived free radicals, in a mouse traumatic brain injury model. *J Cereb Blood Flow Metab* 28:1114-26
- Gao X, Deng-Bryant Y, Cho W, Carrico KM, **Hall ED**, **Chen J** (2008) Selective death of newborn neurons in hippocampal dentate gyrus following moderate experimental traumatic brain injury. *J Neurosci Res* 86:2258-70
- Gao X, **Smith GM**, **Chen J** (2009) Impaired dendritic development and synaptic formation of postnatal-born dentate gyrus granular neurons in the absence of brain-derived neurotrophic factor signaling. *Exp Neurol* 215:178-90
- Gash DM, Rutland K, Hudson NL, **Sullivan PG**, Bing G, Cass WA, Pandya JD, Liu M, Choi DY, Hunter RL, **Gerhardt GA**, Smith CD, Slevin JT, Prince TS (2008) Trichloroethylene: Parkinsonism and complex 1 mitochondrial neurotoxicity. *Ann Neurol* 63:184-92
- Gilmer LK, Roberts KN, **Scheff SW** (2008) Efficacy of progesterone following a moderate unilateral cortical contusion injury. *J Neurotrauma* 25:593-602
- Guseva MV, Hopkins DM, **Scheff SW**, **Pauly JR** (2008) Dietary choline supplementation improves behavioral, histological, and neurochemical outcomes in a rat model of traumatic brain injury. *J Neurotrauma* 25:975-83
- Hall ED**. Free radicals and neuroprotection in traumatic brain and spinal cord injury. (2008) In: Handbook of Neurochemistry and Molecular Neurobiology, 3rd Edition, (Volume 24, S, Ray and N.L. Banik, Ed.) A. Lajtha (Series Ed.), Springer-Verlag, Berlin, pp. 203-228.
- Hall ED**, Bryant YD, Cho W, **Sullivan PG** (2008) Evolution of post-traumatic neurodegeneration after controlled cortical impact traumatic brain injury in mice and rats as assessed by the de Olmos silver and fluorojade staining methods. *J Neurotrauma* 25:235-47

- Hatton J**, Empey P, Rosbolt B, Jackson T, Kryscio R, **Young B**. Dosing and Safety of Cyclosporine in Patients with Severe Brain Injury. *J Neurosurg* 2008 Oct; 109 (4): 699-707.
- Hou S, Duale H, Cameron AA, Abshire SM, Lyttle TS, **Rabchevsky AG** (2008) Plasticity of lumbosacral propriospinal neurons is associated with the development of autonomic dysreflexia after thoracic spinal cord transection. *J Comp Neurol* 509:382-99
- Hunt RF, **Scheff SW**, Smith BN (2008) Posttraumatic epilepsy after controlled cortical impact injury in mice. *Exp Neurol (E Pub)*
- Jin Y**, Ziemba KS, **Smith GM** (2008) Axon growth across a lesion site along a preformed guidance pathway in the brain. *Exp Neurol* 210:521-30
- Kaas JH, Qi H-X, Burish M, Gharbawie O, **Onifer SM**, Massey JM: Cortical and subcortical plasticity in the brains of humans, primates, and rats after damage to sensory afferents in the dorsal columns of the spinal cord. *Exp Neurol* 209:407-416, 2008.
- Lifshitz, J.** (2008) Fluid Percussion Injury. In J Chen, Z Xu, X-M Xu and J Zhang *Animal Models of Acute Neurological Injuries*. Totowa, NJ, The Humana Press Inc.
- Massey JM, Amps J, Viapiano MS, Matthews RT, Wagoner MR, Whitaker CM, Alilain W, Yonkof A, Khalyfa A, Cooper NGF, Silver J, **Onifer SM**: Increased chondroitin sulfate proteoglycan expression in denervated brainstem targets following spinal cord injury creates a barrier to axonal regeneration overcome by chondroitinase ABC and neurotrophin-3. *Exp Neurol* 209:426-445, 2008.
- Mbye LH, **Singh IN**, **Sullivan PG**, **Springer JE**, **Hall ED** (2008) Attenuation of acute mitochondrial dysfunction after traumatic brain injury in mice by NIM811, a non-immunosuppressive cyclosporin A analog. *Exp Neurol* 209:243-53
- Mbye LH, **Singh IN**, Carrico KM, **Saatman KE**, **Hall ED** (2009) Comparative neuroprotective effects of cyclosporin A and NIM811, a nonimmunosuppressive cyclosporin A analog, following traumatic brain injury. *J Cereb Blood Flow Metab* 29:87-97
- Nasr P, Carbery T, **Geddes JW** (2008) N-Methyl-D: -aspartate Receptor Antagonists Have Variable Affect in 3-Nitropropionic Acid Toxicity. *Neurochem Res* Need issue and page numbers
- Nelson PT, Abner EL, **Scheff SW**, Schmitt FA, Kryscio RJ, Jicha GA, Smith CD, Patel E, Markesbery WR (2008a) Alzheimer's-type neuropathology in the precuneus is not increased relative to other areas of neocortex across a range of cognitive impairment. *Neurosci Lett* issue and page numbers
- Nixon K**, Kim DH, Potts EN, He J, Crews FT (2008) Distinct cell proliferation events during abstinence after alcohol dependence: microglia proliferation precedes neurogenesis. *Neurobiol Dis* 31:218-29
- Patel S.P., Pandya J.D., **Sullivan P.G.** and **Rabchevsky A.G.** (2009) Effects of mitochondrial uncoupling agent, 2,4-dinitrophenol, or nitroxide antioxidant, tempol, on mitochondrial integrity following acute contusion spinal cord injury. *J Neurosci Res* 87:130-140. 15 August 2008
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2008 Invited Extramural Seminars, Lectures and Oral Presentations by SCoBIRC Faculty (19)

Hall, Edward D.

- "The Rationale for Combination Therapies for Traumatic Brain Injury", University of Kansas Medical Center, Kansas City, KS January 16, 2008.
- "The Rationale for Combination Therapies for Traumatic Brain Injury", Seminar, Medical College of Virginia; Richmond, VA April 23, 2008.
- "The Development, Growth and Organization of Neurotrauma Research in Kentucky", Medical University of South Carolina, Charleston, SC May 30, 2008.
- "Is Interruption of Oxidative Damage Alone Enough to Achieve Clinically Meaningful Neuroprotection?" 26th National Neurotrauma Symposium; Lake Buena Vista, FL July 29, 2008.
- "Newer Concepts Concerning the Role of Oxidative Damage and Its Treatment in Acute CNS Injury", Gail F. Beach Memorial Visiting Lecture, Miami Project to Cure Paralysis, University of Miami-Miller School of Medicine; Miami, FL December 3, 2008.

Hatton, Jimmi

- "Nutrition support in patients with acute TBI"- The Brain Trauma Foundation, lecture teleconference, Lexington, KY., July, 2008

Lifshitz, Jonathan

- "Mild Traumatic Brain Injury", 41st Annual Winter Conference on Brain Research, Snowbird UT, January 27, 2008
- "Innovative Brain Research in the State of Kentucky", Brain Injury Association of Kentucky Annual Summit, April 18, 2008
- "Traumatic Brain Injury and Epilepsy: Pathophysiology and Prevention", Epilepsy Foundation of Kentuckiana, November 21, 2008.

Rabchevsky, Alexander G.

- "Plasticity of lumbosacral propriospinal neurons is associated with the development of autonomic dysreflexia after thoracic spinal cord transection.", University of California, Irvine, CA, *Second annual Reeve-Irvine Medal Symposium (honoring William C. de Groat)*, March 10, 2008
- "Plasticity of both visceral sensory fibers and propriospinal neurons is associated with the development of autonomic dysfunction after spinal cord injury.", Touro University, Henderson, NV, School of Osteopathic Medicine, June 20, 2008

Saatman, Kathryn E.

- "Axonal Pathology Induced by Rapid Stretch Injury: A Role for Calpains." Neurodegeneration in Glaucoma: From Mechanisms to New Treatments, Vanderbilt Eye Institute, Vanderbilt University, Nashville, TN October 15, 2008.
- "Mechanisms of Brain Injury in TBI." Society for Neuroscience Neurobiology of Disease Workshop: The Neurobiology of Traumatic Brain Injury. Washington, D.C. November 14, 2008.

Smith, George M.

- "Molecular/genetic manipulation of extrinsic axon guidance factors for spinal cord regeneration", 26th National Neurotrauma Symposium; Lake Buena Vista, FL July 27, 2008.

Sullivan, Patrick G.

- "Mitochondrial Aging: Implications for Mitochondrial Bioenergetics and Homeostasis in the Canine Brain." 41st Annual Winter Conference on Brain Research, Snowbird UT, January 27, 2008.
- "Mitochondrial Aging: Implications for Mitochondrial Bioenergetics and Homeostasis in the Non-Human Primate Brain." 41st Annual Winter Conference on Brain Research, Snowbird UT, January 28, 2008.
- "Fatty Acids and Mitochondrial Uncoupling: Altering Mitochondrial Function via Dietary Modulation." International Symposium on Dietary Therapies for Epilepsy and Other Neurological Disorders, Phoenix, AZ February, 21, 2008.
- "Mitochondrial-Targeted Therapeutics for the Treatment of Traumatic Brain and Spinal Cord Injuries." University of Washington, Department of Anesthesiology Grand Rounds, Seattle, WA, June 18, 2008.
- "Targeting the Powerhouse of the Cell as a Therapeutic Intervention for the Treatment of Traumatic Brain and Spinal Cord Injuries." University of Louisville, Department of Neurosurgery Grand Rounds, September, 12, 2008.

2008 Awards, Honors and Elected Offices for SCoBIRC Faculty

Geddes, James W.

- Editorial Board: *Experimental Neurology* (Section Editor)
- Society for Neuroscience: *Members and Chapters Committee member*

Hall, Edward D.

- National Neurotrauma Society President, 2007-2008
- Editorial Boards: *Journal of Neurotrauma*, *Journal of Cerebral Blood Flow & Metabolism*, *Biochemical Pharmacology*
- Elected to National Spinal Cord Injury Association Hall of Fame, November 17th 2008

Hatton, Jimmi

- American College of Clinical Pharmacy Board of Trustees, Research Institute
- American College of Clinical Pharmacy Critical Care PRN, Frontiers Fund Co-Chair

Lifshitz, Jonathan

- Secretary/Treasurer-Elect, National Neurotrauma Society, 2008-2009
- Website Coordinator & International Liaison, Women in Neurotrauma Research
- Outreach Coordinator, Bluegrass Chapter of Society for Neuroscience
- Best Oral Presentation, 20th Annual Physical Medicine & Rehabilitation Research Day, University of Kentucky
- Editorial Board, *Brain Injury*

Pauly, James R.

- 2008 Senior Class Award for Outstanding Basic Science Faculty Member - UK College of Pharmacy
- Outstanding Instructor for second year students - UK College of Pharmacy
- Blouin Award for Professional Teaching in Pharmaceutical Sci. - UK College of Pharmacy

Rabchevsky, Alexander G.

- James W. Holsinger Award for "Excellence in Teaching," Department of Physiology, University of Kentucky College of Medicine

Saatman, Kathryn E.

- James W. Holsinger Award for 'Excellence in Teaching', Department of Physiology, University of Kentucky College of Medicine
- Vice President, National Neurotrauma Society, 2007-2008
- Councilor, National Neurotrauma Society, 2008-2011
- Editorial Board, *Journal of Neurotrauma*

Smith, George M.

- Editorial Board, *International Journal of Pain*

Snow, Diane M.

- National ACE Network Leadership Award (Advancement of Women in Higher Education) for "an outstanding, innovative, and visionary leadership program" (COPS); awarded in San Diego, CA on Feb 8, 2008.
- Kentucky Academy of Sciences Distinguished University Research Scientist, 2008.
- Vice President, National Neurotrauma Society, 2008-2009.

Sullivan, Patrick, G.

- Executive Board member for the Brain Injury Association of Kentucky.

Appendix I

Thursday 14th ANNUAL KENTUCKY SPINAL CORD & HEAD INJURY RESEARCH TRUST SYMPOSIUM (KSCHIRT) June 12, 2008 - Embassy Suites Hotel - Lexington, KY	
7:30 - 8:15 am	REGISTRATION and Continental Breakfast
8:15 – 8:30	Welcome and Opening Remarks Edward D. Hall, PhD, Director, UK Spinal Cord & Brain Injury Research Center
SESSION 1 SIGNALING FOR CELL DEATH AND SURVIVAL James Geddes, Ph.D., Session Chair	
8:30 – 9:15	J. Marie Hardwick, Ph.D., - John Hopkins University <i>Apoptosis factors also regulate synaptic activity</i>
9:15 -10:00	Michal Hetman, M.D., Ph.D. – University of Louisville <i>The bright side of the NMDA receptor: cell survival signaling</i>
10:00 -10:30	COFFEE BREAK AND POSTERS
10:30 -11:15	Pamela A. Maher, Ph.D. – The Salk Institute <i>Common mechanisms underlying Neuroprotection from diverse toxic insults</i>
11:15 -12:00	Jeffrey M. Giddy, Ph.D. – Washington University <i>Stimulating Endogenous Neuroprotective Mechanisms in the CNS</i>
12:00 – 1:00	LUNCH
SESSION 2 NEUROPROSTHESES: STATE OF THE ART BRAIN-MACHINE INTERFACES Alexander G. Rabchevsky, Ph.D, Session Chair	
1:00 – 1:45	John Donoghue, Ph.D. – Brown University <i>Neurotechnology to Restore Communication and Control in Spinal Cord Injury</i>
1:45 – 2:30	Vivian Mushahwar, Ph.D. – University of Alberta CANADA <i>Intraspinal Neuroprostheses for Restoring Standing and Walking after Spinal Cord Injury</i>
2:30 – 3:30	POSTER SESSION and BREAK
3:30 – 4:15	Aimee Arnoldussen, Ph.D. – WICAB, Inc. <i>BrainPort[®] as a Neural Prosthesis: Balance and Vision Applications</i>
4:15 – 5:00	Greg A. Gerhardt, Ph.D. – University of Kentucky (Department of Anatomy & Neurobiology) <i>Brain Machine Interfaces: Second-by-Second Chemical Signaling in the CNS</i>
DINNER AT WOODFORD RESERVE DISTILLARY AND TOUR	
5:15-5:30	Load 2 Bluegrass Tours Buses at the Embassy Suites Hotel or drive in your car to Woodford Reserve Distillery for a Tour and Dinner (30 minute drive) 7855 McCracken Pike, Versailles, KY (Directions on Registration Table)
6:30-8:30	DINNER at Woodford Reserve Distillery
8:45-9:00	Load 2 Bluegrass Tours Buses to return to Lexington, KY

Friday

**14th ANNUAL KENTUCKY SPINAL CORD & HEAD INJURY
RESEARCH TRUST SYMPOSIUM (KSCHIRT)
June 13, 2008 - Embassy Suites Hotel - Lexington, KY**

8:00 – 8:30 am REGISTRATION and Continental Breakfast

SESSION 3

**AXON GUIDANCE AND SYNAPTOGENESIS
Stephen Onifer, Ph.D., Session Chair**

8:30 – 9:15 Nicholas C. Spitzer, Ph.D. – University of California, San Diego
New levels of plasticity: activity-dependent switching of transmitter and receptor specification

9:15 – 10:00 Jeffery L. Twiss, M.D., Ph.D. – Alfred I DuPont Hospital for Children
Neuronal RNA localization & localized translation after axonal injury

10:00 – 10:30 COFFEE BREAK

10:30 – 11:15 William Snider, M.D. – University of North Carolina
Regulation of axon growth by RAF/MEK/ERK and GSK-3 signaling pathways

11:15 - 12:00 George Smith, Ph.D. – University of Kentucky (Department of Physiology)
Targeting axon growth and regeneration within the adult CNS

12:00 – 1:00 pm LUNCH

SESSION 4

**BRAIN INJURY: FROM FRONTLINES TO FRONTIERS
Jonathan Lifshitz, Ph.D., Session Chair**

1:00 – 1:45 Richard M. McCarron, Ph.D. – Naval Medical Research Center
Blast-induced trauma: vital mechanisms of injury, diagnosis and treatment

1:45 – 2:30 Walter M. High, Jr., Ph.D. – University of Kentucky (Cardinal Hill Rehabilitation Hospital)
The Effect of Growth Hormone Replacement Therapy on Neuropsychological Impairment Following Traumatic Brain Injury

2:30 – 3:30 POSTER SESSION AND BREAK

3:30 - 4:15 Robert J. Hamm, Ph.D. – Virginia Commonwealth University
Selective Cognitive Impairment following Experimental Brain Injury

4:15 – 5:00 Alan I. Faden, M.D. – Georgetown University
New Therapeutic Approaches to Traumatic Brain Injury

5:00 – 5:15 CLOSING REMARKS