



The KSCIRC Report • Spring 2013

UL OF KENTUCKY SPINAL CORD
INJURY RESEARCH CENTER

DIRECTORS' UPDATE New KSCIRC Faculty

Scott R. Whittemore, Ph.D., Scientific Director
Jonathan E. Hodes, M.D., Clinical Director
Susan J. Harkema, Ph.D., Rehabilitation Director

MORE THAN THREE YEARS AGO, the KSCIRC faculty set out to develop our 5 year plan for the Center. Little did we know how long that process would take or, ultimately, how successful we would be. From a research standpoint, we identified two areas that we felt were essential to our continued success and expansion. The first was translational research that would both expand the rehabilitation research program directed by Dr. Susan Harkema as well as bring new expertise that would bridge basic science animal studies with that rehabilitation research. From a clinical standpoint, Dr. Jonathan Hodes, KSCIRC clinical director and Chairman of the Department of Neurological Surgery, also wanted to expand the Physical Medicine and Rehabilitation faculty. The second research area that we believed necessary was imaging. For this latter emphasis, we wanted to recruit a scientist with expertise in the latest laser microscopic technology that would allow real time visualization of the processes that regulate injury and recovery after SCI. The past six months has been an exciting time for the KSCIRC and the Department of Neurological Surgery as we have added 6 new full time faculty members

that collectively fulfill these goals. With respect to translational research, Dr. Andrea Behrman, Dr. Dena Howland, Dr. Darryl Kaelin, Dr. Steve Williams, and Dr. Dimitri Sayenko have all joined the faculty. Dr. David Stirling brings his extensive neural imaging expertise to the Center. Drs. Behrman, Kaelin, and Williams are all also involved in patient care. All of these faculty are profiled in this newsletter.

With respect to our clinical neurosurgery faculty, multidisciplinary collaboration is also enhanced by the presence of Dr. Maxwell Boakye, a clinician-scientist neurosurgeon who joined the University two years ago. Dr. Boakye directs two labs in spinal cord injury and brain injury outcomes, as well as general neurosurgical outcomes and also has a basic research laboratory. Dr. Boakye is also profiled here. In 2012, Dr. Thomas Altstadt, a neurosurgeon specializing in minimally invasive spine and spine trauma surgery, joined the faculty. Dr. Warren Boling, Vice-Chair for Clinical Development, and Dr. Michael Park, are deeply involved in neuro-oncology and functional neurosurgery, treating patients and conducting research in movement disorders, epilepsy and

tumors of the brain and spine. Dr. Boling also has an active clinical research program. Dr. Haring J.W. Nauta is a world-renowned neuroanatomist and neurosurgery educator who has revived the neurosurgical residency, restoring it to full accreditation as of last year.

This faculty expansion is noteworthy for a number of reasons. First and foremost, the track records and new expertise that these faculty bring to the KSCIRC is outstanding. We are very pleased that they chose to join us here at the University of Louisville. Our rehabilitation research SCI program is now one of the strongest in the world. The expansion of the basic science faculty with Dr. Howland and Dr. Stirling opens up strong new collaborations and will allow current faculty research programs to develop new and exciting directions. Most importantly, our basic philosophy is to have excellence in clinical service for neurosurgical and rehabilitation patients coupled with strong basic and translational research programs leading ultimately to better patient care. This goal will be substantially enhanced by these new faculty. We look forward to detail our progress in subsequent newsletters.

Grateful for Dr. Hodes' Leadership -



Dr. Hodes

Dr. Jonathan E. Hodes has stepped down as Chairman of Neurological Surgery and as of June 30, 2013 will resign his full time appointment with

the University of Louisville to return to private practice. The KSCIRC faculty is exceedingly grateful to Dr. Hodes for his leadership over the past 4 years.

Dr. Hodes took over as Chairman at a critical and very uncertain time in the Department of Neurological Surgery. Under his guidance, and as documented in this newsletter, new surgical faculty were hired and the Division of Physical Medicine and Rehabilitation was expanded. Moreover, the residency program was re-accredited, as was the Level 1 trauma center. Additionally, strong ties have been established between the clinical, rehabilitation, and research faculty that

has markedly enhanced the research capacity of the Department. We thank Dr. Hodes for his extraordinary efforts for the Department and the University, and most importantly for the patients. Warren W. Boling, Jr., M.D., Professor of Neurological Surgery, has been named as Interim Chairman.



Dr. Boling

Meet the new KSCIRC Basic Science and Clinical Faculty -

ANDREA L. BEHRMAN, PH.D.

Professor, Department of Neurological Surgery – Pediatric Rehabilitation and Recovery Laboratory Furman University, B.S. Biology; Duke University, M.S. Physical Therapy; University of Florida, Ph.D. Exercise Science



On September 1, 2012, I joined the faculty in the Department of Neurological Surgery, University of Louisville and the Kentucky Spinal Cord Injury Research Center having been at the University of Florida, Department of Physical Therapy, for 17 years and the Malcom Randall VA Medical Center's Brain Rehabilitation Research Center for 10 years. I also am a

co-Director of the Reeve Foundation NeuroRecovery Network with the mission of rapid translation of evidence for activity-based therapies into clinical practice to enhance recovery after SCI. This collaborative community among UofL, KSCIRC, and Frazier Rehabilitation Institute offers an incredible opportunity to be immersed in research with new collaborations as well as effective deployment and translation of therapies into practice.

My research targets recovery of walking after SCI in adults and children applying principles of activity-dependent plasticity and knowledge of the neurobiology of walking. A primary purpose for moving to Louisville is to lead and develop a unique and progressive, pediatric rehabilitation and research program aimed at maximizing recovery after neurologic injury using activity-based interventions. While our first efforts will be with children post-SCI and building upon the findings of our recent Kids STEP Study, we will spread our work to other populations (e.g. children and adolescents with cerebral palsy or spina

bifida). We aim to better identify those children with SCI and non-ambulatory who will benefit from locomotor training to recover walking, improve sitting balance, or recover bowel and bladder function and how recovery occurs.

In her spare time, Dr. Behrman enjoys water activities – kayaking, wind-surfing, sailing, and water-skiing. With eight kayaks, she is ready to venture out with friends and explore the area waters.

MAXWELL BOAKYE, M.D. MPH, MBA, FACS, FAANS

Associate Professor of Neurosurgery, Ole A., Mabel Wise & Wilma Wise Nelson Endowed Chair, Chief of Spinal Neurosurgery at UofL, Director of Outcomes and Translational Research, Center for Advanced Neurosurgery. Rutgers University, B.A. Mathematics and Physics; Weill Cornell Medical College, M.D.; Neurosurgical Residency Training at SUNY-Upstate; Emory University, Subspecialty training in complex spinal neurosurgery; Memorial Sloan-Kettering Cancer Center, training in spinal oncology. MPH, Johns Hopkins Bloomberg School of Public Health, MBA, University of Tennessee



I was recruited by the Department of Neurological Surgery to the University of Louisville in January 2011. Prior to that I was Assistant Professor of Neurosurgery at Stanford University from 2003-2010. I was the director of the Neural Plasticity Lab and Outcomes Research Laboratory at Stanford University and Palo Alto VA from 2003-2010. I currently have a 50% research appointment and am the Chief of spinal neurosurgery at the University of Louisville hospital. I am also Director of the

spinal cord and brain injury research lab and the Neurosurgical Outcomes and Translational research lab within the Department of Neurosurgery.

Research in the spinal cord and brain injury lab uses noninvasive multimodal methodologies including functional magnetic resonance imaging (fMRI), diffusion tensor imaging (DTI), transcranial magnetic stimulation (TMS), transcranial and transcutaneous direct stimulation, electroencephalography (EEG), somatosensory evoked potentials (SEP), and peripheral nerve stimulation (PNS) technologies to gain a comprehensive understanding of the physiology and plasticity of the sensorimotor system in healthy patients and in patients with spinal cord and brain injury. We have also recently been performing animal and human studies evaluating impact of BDNF Val66met polymorphisms on spinal plasticity and functional recovery.

The outcomes research lab focuses on health related quality of life, cost effectiveness and health economic evaluations after neurosurgery. We perform prospective evaluation of clinical and health related quality of life outcomes after a variety of neurosurgical procedures.

In my spare time, I play tennis and golf, piano and chess. I like watching world class soccer and listening to music. I also like beach vacations-sitting on the beach doing nothing and watching my 12 year old son and 8 year old daughter play.

DENA R. HOWLAND, PH.D.

Associate Professor, Department of Neurological Surgery Laboratory of Neural Repair, Plasticity and Functional Recovery Ohio State University, BS, Allied Medical Professions, major: Occupational Therapy; Medical College of Pennsylvania, Ph.D. Anatomy & Neurobiology; University of Florida, Postdoctoral Training, Neuroscience



On September 1, 2012, I joined the faculty in the Department of Neurological Surgery, University of Louisville and the Kentucky Spinal Cord Injury Research Center. I moved my research program from Gainesville, Florida where I was a member of both the Department of Neuroscience at the University of Florida and Research Service at the Malcom Randall VA Medical Center for 18 years. I have maintained my VA affiliation in Louisville through an appointment at the Robley Rex VA Medical Center.

My research focuses on understanding the response of the spinal cord to injury and identifying approaches to enhance repair, plasticity and motor recovery. At the basic science level, we have placed significant effort on the study of the chondroitin sulfate proteoglycan family and an enzyme, chondroitinase

abc, which alters their growth inhibitory nature. Our aim is to better understand how this enzyme works, the most effective window(s) for delivery post-spinal cord injury, and if its benefits can be amplified by combining it with other potential therapeutic agents, including training (activity-based rehabilitation). In addition to cellular and molecular assessments to understand changes in protein expression, spinal circuitry and long tracks, we evaluate functional changes using several approaches including 3D kinematic assessment of locomotion. At the clinical research level, our major focus is on enhancing motor recovery using activity-based interventions. This work has been done in collaboration with Dr. Andrea Behrman who also moved from Florida and joined the faculty in the Department of Neurological Surgery. Our current major focus is on the use of Locomotor Training (LT) in young children with severe, chronic spinal cord injuries who show little to no clinical potential for walking recovery. A small study which we conducted in Florida suggests that 50% of these children may develop walking with this approach. Among our goals are to develop predictive measures to identify those children who have the greatest potential to respond to LT, develop approaches to accelerate the response to LT, and to understand underlying circuitry changes.

My husband, three children, and 'zoo' moved with me to Louisville. My husband teaches at Bellarmine, my oldest daughter is a sophomore in college, my son is a sophomore in high school, and my youngest daughter is in 6th grade. Our 'zoo' includes a horse, dog, two cats, guinea pig and fish!

DARRYL KAELIN, M.D.

Owsley B. Frazier Associate Professor, Endowed Chair of Physical Medicine and Rehabilitation, Chief, Division of Physical Medicine & Rehabilitation, (PM&R) Department of Neurological Surgery University of Notre Dame, B.A. Pre-Professional Studies and Psychology, M.D. University of Louisville School of Medicine, Internship-Transitional Year, Kettering Medical Center, Residency-Physical Medicine and Rehabilitation, Medical College of Virginia.



In 2011, the University of Louisville took a bold step in creating a Division of Physical Medicine and Rehabilitation (PM&R) within the Department of Neurological Surgery. Along with already well respected surgical, basic and translational research divisions, this newly formed neuroscience entity has quickly become recognized as one of the most unique academic endeavors of its kind. When I was recruited as the first Chief of the division in June 2011, three well established physiatrists were already in place. The first job at hand was to finish writing the NIDRR Spinal Cord Injury Model Systems grant application. A great team effort lead to a successful award of over 2.2 million dollars

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“The track records and new expertise that these faculty bring to the KSCIRC is outstanding.”

— Scott R. Whittemore, Ph.D., KSCIRC Scientific Director

NEW FACULTY
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over 5 years. Having focused on neurorehabilitation for over 17 years, I was quite comfortable managing the clinical and research needs of spinal cord injured patients in the department but my primary interest has been in traumatic brain injury.

Since my start, the division of PM&R has grown from four physiatrists to ten with specialization ranging from pediatric rehab to sports medicine, cancer and pain management. Our clinical practice ranges from Shelbyville, KY to New Albany, IN and covers such diverse patient care settings as the Frazier Rehab Institute, University Hospital, James Graham Brown Cancer Center, subacute rehab units in skilled nursing facilities and numerous outpatient clinics.

The factor that makes us most unique; however, is how basic science research is translated into direct patient care. At most academic medical centers clinical questions drive basic science research but rarely do the two entities interact. At UofL, KSCIRC researchers reach out to clinicians and translate bedside breakthroughs into bedside results. This type of knowledge translation is unprecedented and our department is proud of the leadership we bring to the field of neurological rehabilitation.

DIMITRY SAYENKO, M.D., PH.D.

Russian State Medical University, M.D., Internal Medicine; Neurological residency training at the Russian Institute of Neurology; Russian Federation State Scientific Centre – Institute for Bio-Medical Problems, Academy of Sciences, Ph.D., Aerospace Medicine; National Rehabilitation Center for Persons with Disabilities (Japan), Postdoc; Toronto Rehabilitation Institute, University of Toronto (Canada), Postdoc



I am a new member to KSCIRC and the University of Louisville. After completing medical school in Moscow, I worked at the Institute for Biomedical Problems – a leading Russian research institute specializing in biomedical aspects of manned space missions. I have been involved in studies investigating the negative effects of microgravity on motor

control of cosmonauts and astronauts. Due to my clinical background, I understood from the beginning that changes

occurring in the nervous and musculoskeletal systems after space flight are very much alike to those following a number of neuromuscular injury or disease. I was thrilled with the idea that treatments for functional recovery during and after space flight might be implemented in rehabilitation. I intend to use my multidisciplinary background to address current issues of the neuromuscular rehabilitation after SCI such as recovery of standing and sitting balance, and improvement of strength and endurance in impaired muscles. I will also explore the strategies for regaining functionality during self-governed standing and sitting, and will examine non-specific effects of the balance training in SCI on respiratory function, gait, and muscle strength.

I love spending time with my wife and two children. I also enjoy cooking and introducing my friends to delectable and sometimes sophisticated Russian cuisine.

DAVID P. STIRLING, PH.D.

Assistant Professor, Departments of Neurological Surgery and Microbiology and Immunology
Laboratory of Advanced Optical Imaging
BSc University of British Columbia, Cell Biology and Genetics
Ph.D. Zoology, Option: Neurobiology, University of British Columbia



I joined the Department of Neurological Surgery and KSCIRC in August 2012, moving with my family from Calgary, Alberta, Canada. I am extremely excited with the many opportunities to conduct world class research at the University of Louisville. As I develop the Laboratory of Advanced Optimal Imaging, I plan to extend my ongoing international

collaborations with new collaborations here within the KSCIRC facility. My laboratory uses advanced optical imaging techniques (e.g., two-photon spectral microscopy) to investigate intrinsic and extrinsic mechanisms of white matter degeneration in living tissue following trauma to the nervous system. A major thrust in the laboratory is to understand the role of microglia, the immunocompetent cells of the CNS, and blood-derived immune cells (neutrophils and monocytes) in central myelinated fiber degeneration following spinal cord injury (SCI). Utilizing two-photon intravital microscopy to image

genetically encoded fluorescent proteins in these cells, my team will be able to track, quantify, and interrogate the role of neuroinflammation in SCI pathophysiology as these dynamic events are unfolding in real time. Second, my team will also focus on intrinsic mechanisms of central myelinated fiber injury following trauma utilizing a combination of in vivo and ex vivo live spinal cord preparations to visualize the dynamic response of spinal axons to injury in real time. It is hoped that the new knowledge gained from these basic science studies will uncover key mediators that play a role in axon and myelin damage, and pave the way for therapeutic interventions to promote tissue sparing and improve neurological outcome following human SCI.

My wife Tiffany and I spend our free time raising our two beautiful daughters and caring for our two dogs and cat. Together they are enjoying their most recent adventure to Louisville and enjoying the rich, diverse, and beautiful landscape that Kentucky offers.

STEVE WILLIAMS, M.D.

Professor, Department of Neurological Surgery
Chief, Spinal Cord Medicine Director, Translational Research
VP, Medical Affairs. University of Virginia, Charlottesville, VA
BA History; Medical College of Virginia, School of Medicine,
Dentistry; Eastern Virginia Medical School, Norfolk, VA MD



I was recruited to the University of Louisville School Of Medicine, Department of Neurosurgery to serve as Chief of Spinal Cord Medicine, Director of Translational Research and Vice President of Medical Affairs at Frazier Rehabilitation and Neuroscience Institutes in July 2012.

I hold the faculty rank of Professor of Physical Medicine & Rehabilitation and am the Co-Principal Investigator of the Kentucky Regional Spinal Cord Injury Center's Spinal Cord Injury Model Systems Grant from the National Institute's on Disability and Rehabilitation Research (NIDRR). In addition I hold grants from the Center for Disease Control and Prevention (CDC) focusing on the prevention of secondary effects from paralysis. My specialized interests include activity based therapies and functional recovery, prevention of the secondary effects of paralysis, consumer education and advocacy and emerging technologies in rehabilitation.

Practicing in spinal cord medicine allows me the opportunity to assist patients who have experienced a catastrophic life change. I am thrilled to have the opportunity to work with the world-class researchers and caregivers at Frazier Rehab and the University of Louisville.

In his spare time he likes to travel and is an avid art collector.

SPOTLIGHT on a KSCIRC TRAINEE April Herrity



April Herrity joined the doctoral program in Anatomical Sciences and Neurobiology in 2009. From her clinical background as a chiropractor, where she treated a variety of musculoskeletal and neurological conditions, she became interested in chronic pain and rehabilitation. Through

research, April felt that she would have the opportunity to apply what she learned from working with patients and address questions that revolved around some of the clinical conditions she encountered.

"Prior to my admittance in the Ph.D. program, there were a few significant events that solidified in my mind a need to be involved with the research that was happening here at the University of Louisville. First, influenced by a patient of mine, I attended a stroke workshop, given by Dr. Kerri Rimmel. There, I not only was provided with latest information related to stroke, but also saw the balance between physician and researcher, where patients truly benefited from the work that was done in the lab. A short while later, I was then fortunate to be able to sit down and meet Dr. Scott Whittemore during a visit to the University. After hearing about my research interests, he showed me a brief video, from the work of Dr. Harkema and Frazier Rehab, of a spinal cord injured patient undergoing gait retraining. I was truly inspired and realized how research can make such an impact on the quality of life for patients and now wanted to know how I could contribute as well. Given my background, I approached my mentor, Dr. Charles Hubscher, about joining his lab. I felt that he had an established track record of conducting research in many of my interest areas: spinal cord injury, rehabilitation and the neural processing of pain. Once I joined the Hubscher lab, I was given the opportunity to become involved with a large rehabilitative study that incorporated locomotor training and assessed outcomes such as gait and kinematics, bladder function and pain."

Recently, April was awarded an F31 fellowship from the NIH. Her project will evaluate the neural connections to the bladder and colon, and in particular, emphasize the role the vagus nerve plays following spinal cord injury. Her aim is to outline and understand the anatomical connections from these organs and how they may potentially aide in the development of therapeutic strategies that assist spinal cord injured patients with urinary/bowel dysfunction and abnormal visceral pain sensations. In her spare time, April enjoys running, playing soccer and outdoor activities with her family.

KSCIRC Trainees Win at 2012 Research Louisville -



Nick Kuypers, Ph.D. Candidate, Mentor: Scott R. Whittemore, Ph.D. – Nick won the Michael Tanner Memorial Award for Excellence in Graduate Research. It was awarded by the Institute for Cellular Therapeutics. Poster title: Dynamically regulated oligodendrocyte precursor cell microRNA expression during cuprizone induced demyelination and remyelination.

This research focuses on identifying molecules inside cells which regulate the production of proteins. A better understanding of these molecules will aid in the development of therapeutic strategies to enhance the natural repair process following spinal cord injury and other demyelinating neurological diseases such as Multiple Sclerosis.



Kristopher Rau, Ph.D., Mentor – Jeffrey C. Petruska, Ph.D., won First Place in the Postdoctoral Fellows, Research Associates division. Poster Title: Impact of tissue damage on sensory neurons and the implications for mechanisms of chronic pain". The development of chronic neuropathic pain is a serious medical

problem. Using skin incision as a model of tissue damage, this study shows that even minor tissue injury causes changes to the gene expression and electrical properties of nerve cells involved in pain sensation. Many of these effects are maintained long after the skin incision has healed, are resistant to standard clinical interventions such as anesthetics and anti-inflammatory drugs, and are enhanced by repeated injury. For communities such as those with spinal cord injury, traumatic brain injury, stroke, and other neurological disorders which themselves may

constitute an initial injury, our findings may represent a new consideration for the impact that tissue damage may have on the health and well-being of individuals and on developing strategies for treatment.

Kris also recently published a manuscript entitled Genetic identification of C fibres that detect massage-like stroking of hairy skin in vivo (Vrontou S, Wong AM, Rau KK, Koerber HR, Anderson DJ, Nature, 2013: 493:669-73). Nature is one of the world's top scientific journals.



Cassandra Conrad, M.D. Candidate, Mentor – Richard L. Benton, Ph.D. won Second Place in the Medical Student division. Poster Title: Role of endothelial miRNAs in acute microvascular plasticity following spinal cord injury (SCI). Primary trauma to spinal tissue causes immediate tissue destruction and vascular disruption

leading to a robust inflammatory cascade, contributing to chronic loss of function. A temporally specific adaptive blood vessel growth response occurs in/around the injury site over the first week post-SCI; but little is known of the molecular regulation of this response. Micro-RNAs (miRNAs) are small, non-coding ribonucleic acids (RNA) that robustly regulate gene expression. The purpose of the current study was to determine if miRNAs are involved in acute microvascular dysfunction post-SCI. Inhibiting the activity of a specific miRNA (miR-126) blocked acute blood vessel growth at the site of application 2-5 days post-SCI. Taken together, these results suggest that miRNAs are indeed regulators of microvascular pathology post-SCI.

Jill Ward Dissertation Defense

Patricia J. Ward, Ph.D., Dept. Anatomical Sciences & Neurobiology, University of Louisville, Defended her dissertation on 04//10/12. The title of her thesis was: Multi-system functional recovery via task specific locomotor training post spinal cord injury: implications for experimental models, translation, and quality of life. Jill's dissertation work examined the effects of treadmill step training on bladder function using a clinically-relevant rodent model of SCI. With task specific step training of sufficient intensity and duration, improvements in bladder function and a reduction in chronic pain were found, in addition to locomotor gains. These novel findings suggest that step training following SCI could translate to significant quality of life gains for a wide range of functional deficits.

Pictured with her defense committee are L to R, Jeffrey C. Petruska, Ph.D., Alexander G. Rabchevsky, Ph.D. (seated), Charles H. Hubscher – Mentor, David S.K. Magnuson, Ph.D., Jill, Scott R. Whittemore, Ph.D. and Susan J. Harkema, Ph.D



Fundraising Events & Opportunities



The Todd Crawford Foundation gave \$14,000 in 2012

UPCOMING EVENTS

August 17 – 2013 Kickball Tournament

For more information, please go to:
www.todd Crawford Foundation.org



UPCOMING EVENTS

June 27 – 6th Annual *A Legacy Continues* Dinner

July 27 – 4th Annual Motorcycle Rally & Poker Run

September 11 – Annual Golf Scramble and Auction

September 28 – 17th Annual 5K Run/Walk and Wheel

For more information, please go to:
www.friendsformichael.org

KSCIRC Named Beneficiary of Event



On February 1, 2013 the Kentucky Pro Football Hall of Fame announced its 2013 inductees. On that same date, the Kentucky Spinal Cord Injury Research Center (KSCIRC) was also named the beneficiary of the proceeds from this event. Over the years, numerous football players have sustained spinal cord and head injuries. With neurological injuries in the forefront of NFL news, KSCIRC is a perfect partner for this year's proceeds. The

proceeds from the Hall of Fame events to be held on June 27 and June 28 will assist researchers in their endeavors to help those with spinal cord and head injuries.

The Kentucky Pro Football Hall of Fame was originated by Frank Minnifield, the current Chairman of the UofL Board of Trustees. Of special note, the Blanton Collier award recipient this year will be the Harbaugh family. John Harbaugh won the 2013 NFL Super bowl against his brother Jim Harbaugh. (The entire Harbaugh family will attend this event).



To participate in the Hall of Fame events and purchase tickets go to <http://www.kyprofootballhof.org/>

Recent KSCIRC Grant Awards

David Magnuson, Directing spinal cord plasticity: The impact of stretch therapy on functional recovery after spinal cord injury, Department of Defense, 09/30/12-09/30/15, Total Award: \$685,000

Andrea Behrman, Neuromuscular Recovery Scale for Pediatric Spinal Cord Injury, Craig H. Nielsen Foundation, 07/01/13-06/30/15, Total Award: \$300,000

Dena Howland, Research Career Scientist Award, Rehabilitation Research and Development Service (RR&D), Veterans Administration, 10/01/13-09/30/18, Total Award: \$450,000

19th Annual Kentucky Spinal Cord and Head Injury Research Trust Symposium

On May 6 – 7, 2013, the KSCIRC faculty hosted our biannual meeting that brings outstanding scientists from all over the world to Louisville to discuss their latest research. While some of the talks focused directly on spinal cord injury (SCI) and traumatic brain injury (TBI), the overall focus of the meeting is to bring novel methods and research directions in many diverse fields to stimulate new ideas and collaborations for SCI and TBI research here at UofL and with our colleagues at UK. Dr. Mary Bartlett Bunge from the University of Miami was the keynote speaker and she charted a 40 year history of initial cell culture work with spinal cord tissue in cell culture through recently initiated clinical trials. It was an outstanding opening to set the tone for the meeting. Four of our trainees from UofL and UK were selected to present their latest work at this important national meeting. The complete program from the meeting can be found at <http://louisville.edu/kscirc/files/2013%20KSCHIRT%20Program.pdf>



Beginning front row left Mary Bunge, Ph.D., Linda C. Hsieh-Wilson, Ph.D., Jacqueline C. Bresnahan, Ph.D., Jonathan Sweedler, Ph.D., Edgar T. Walters, Ph.D., Jeffrey C. Petruska, Ph.D., Richard L. Benton Ph.D., Xiao-Ming Xu, M.D., Ph.D., John H. Martin, Ph.D., Pramod Dash, Ph.D., Peter Stys, M.D., Sheng-Kwei "Victor" Song, Ph.D., Rajiv R. Ratan, M.D., Ph.D., Scott R. Whittemore, Ph.D., Michal Hetman, M.D., Ph.D., Theo Hagg, M.D., Ph.D. The complete list of speakers, their titles and topics can be found at <http://louisville.edu/kscirc/files/2013%20KSCHIRT%20Program.pdf>

Kentucky Spinal Cord Injury Research Center
University of Louisville
511 S. Floyd St.
Louisville, KY 40292



**KENTUCKY SPINAL CORD
INJURY RESEARCH CENTER**

Kentucky Spinal Cord Injury Research Center -

Yes, I want to help support research and education at the Kentucky Spinal Cord Injury Research Center so that we can find new treatments for these devastating injuries.

Enclosed please find my tax-deductible contribution of \$ OR
I pledge a contribution of \$ to KSCIRC over years.

Yes, please send me regular reminders

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My gift is in honor of/memory of (*circle one*):

If you would like to designate how your contribution will be allocated, please express your wishes below. If you do not specify an allocation, the funds will be used where there is the most need.

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like more information, please
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ryan.coady@louisville.edu*

