



*South Carolina
Spinal Cord Injury
Research Fund*

2007/2009
Biennial Report

State of South Carolina
Spinal Cord Injury Research Fund Board
"Dum Spiro Spero - While I Breathe, I Hope"

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Dear Friends and Supporters:

On behalf of the Board and staff, it is my pleasure to present this Biennial Report for Fiscal Years 2007-09. This Report highlights another two years of progress and accomplishment in carrying out our legislative mandate of promoting research to develop better understanding of, causes of, and effective treatment strategies for, spinal cord injuries (SCI).

During this period, we continued our processes of supporting research on SCI throughout the state of South Carolina. Perhaps no better measure of the success of this research is the outstanding level of accomplishments by grantees. They have published 112 manuscripts in professional journals on the topic of SCI and made 215 presentations at professional conferences.

This was also a period in which we tragically lost our administrator, Walker Coleman. He was instrumental in the success of the SCI research Fund from its implementation. Walker was a tireless advocate for people with SCI and other disabling conditions. Walker always put the interests of the research fund first, yet took minimal credit for his accomplishments. We all miss him dearly. He had just begun preparing the Annual Report for FY 07-08 when he passed away in August of last year. This Biennial Report reflects, in part, his multiple responsibilities and a period when a variety of individuals courageously assumed his duties. As a result, it was difficult to continue the tradition of an Annual Report, and we elected to combine the two years to bring you a more comprehensive Biennial Report.

Special thanks are due to all who have been so interested and supportive, particularly the South Carolina Legislature, the Governor, the Medical University of South Carolina, Clemson University, and the University of South Carolina.

Sincerely,

Brian G. Cuddy, M.D., Board Chair

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Spinal Cord Injury Research Fund Board of Directors



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James Walker Coleman, III: a Selfless Administrator of the SC Spinal Cord Injury Research Fund

Historian, cultural arts enthusiast, long-time MUSC employee, and Fund Administrator for the South Carolina Spinal Cord Injury Research Fund, James Walker Coleman III, died suddenly on July 14, 2008.



Walker was born Feb. 8, 1942. He was the son of the late Margot Hamilton Coleman and James Walker Coleman Jr. He was a 1960 graduate of Charleston High School and the University of Southern Mississippi and University of Georgia Business School. He was a U.S. Coast Guard reservist and member of the Carolina Yacht Club, Charleston Club, St. Andrew's Society, Saint Cecelia Society, Society of Colonial Wars, Society of 1812, Society of the Cincinnati and numerous other civic organizations. Recently, he was administrator of the S.C. Spinal Cord Injury Research Fund established by the S.C. General Assembly in 2000.

A dedicated employee, Coleman began his career at MUSC Nov. 1, 1967, where he began working several positions. Coleman served MUSC working under four MUSC presidents and spanning a period of more than 40 years of service. In 1971, Coleman was director of the S.C. Regional Medical Program, an organization established to help unite the country's health resources by region and developed collaborative work relationships focused on advancing scientific knowledge and clinical practices to patients. Throughout his career, he helped guide the institution through some of its most challenging periods and other significant achievements.

He is survived by his wife -- Debby Larkin Coleman of Charleston, his father -- James Walker Coleman Jr., and two sons -- James Walker Coleman IV and Chisolm Larkin Coleman.

"Walker was one of the nicest persons I've ever met. He handled so many responsibilities at MUSC, from running the Rumor Mill, to coordinating the Spinal Cord Injury Research Fund, to helping with graduation and special events. He will be deeply missed by all who had the privilege of working with him." *Ray Greenberg, M.D., Ph.D., MUSC president*

"We lost our good friend, Walker Coleman, founding administrator of the South Carolina Spinal Cord Injury Research Fund, who passed away unexpectedly. There is no way we can express in words our heartfelt sympathy at his loss or our everlasting gratitude for his lifelong commitment to people with disabling conditions. His work as administrator was central to the success of the research fund, and any future accomplishments will be attributable to the foundation he has laid. I have never met a kinder person, nor have I met anyone who cared more about others. He always worked behind-the-scenes and only accepted individual recognition when it was thrust upon him. He helped navigate the research fund through the early years, always mindful of our central goal and commitment to people with SCI in the state of South Carolina. All of us with SCI owe him a great debt of gratitude." *James Krause, Ph.D., Scientific Director, SC Spinal Cord Injury Research Fund*

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SOUTH CAROLINA SPINAL CORD INJURY RESEARCH FUND FY 07-09 BIENNIAL REPORT

PART I, OVERVIEW

PURPOSE/CHARGE

Promoting research to develop better understanding of causes and effective treatment strategies for paralysis, sensory loss, and other consequences of spinal cord injury (SCI) and disease.

LEGISLATIVE BACKGROUND

The South Carolina Spinal Cord Injury Research Fund (SCSCIRF) was established in 2000 by amendment (Bill S54 44-38-510) to Section 2, Chapter 38, Title 44 of the 1976 S.C. Code as signed by the Governor on July 20, 2000.

GOVERNANCE

The Fund is governed by a seven member Board appointed by the Governor upon the recommendation of the President of the Medical University of South Carolina (MUSC). It is comprised of two medical doctors from MUSC; two medical doctors at large specializing or significantly engaged in the treatment of spinal cord injury; two members who have a spinal cord injury or a family member; and one at large medical doctor who is a member of the South Carolina Medical Association.

ADMINISTRATION

The Fund is administered through MUSC by a part-time Administrator (Thomas B. Higerd, Ph.D.) who was recommended by the MUSC President and approved by the SCSCIRF Board. Dr. James Krause and Dr. Naren Banik are appointed to the post of part-time Scientific Director and part-time Associate Scientific Director, respectively. The Scientific Directors oversee all aspects of research development and implementation including setting goals, developing project invitations to meet goals, and making recommendations based on their reviews to the SCSCIRF Board of all such projects received.

AMOUNT COLLECTED

The \$100 per DUI surcharges was first received in March of 2001. As of June 30, 2009, the Fund had raised \$6,234,704.82. The average monthly amount collected has been about \$61,000.

PRIMARY OBJECTIVES

Advance knowledge of SCI injury repair and regeneration within the SC research community by encouraging physicians and scientists to apply expertise to SCI field.

- Foster collaborative interdisciplinary approaches to SCI research among SC hospitals, rehabilitative centers, research universities, and interested organizations.

- Nurture next generation of SCI researchers through support of young scientists and post-doctoral fellows.
- Improve the well-being and quality of life of individuals with SCI by research programs that prevent or treat the secondary conditions and consequences of SCI.
- Set budgets and administer funds for SCI research as mandated by the SC Legislative Act, and assure highest quality of research and commitment by investigators.

INITIAL FUNDING PRIORITIES

- Translating basic and pre-clinical findings into clinical applications.
- Studying strategies to promote growth and survival at cellular level.
- Assuring efficacy of drugs or other interventions to prevent or reduce secondary injury and to provide insight to the mechanisms causing this progressive damage.
- Exploring the role of tissue transplantation in restoration of spinal cord function.
- Studying other disorders of spinal cord or brain that are reasonably expected to produce new insight into the mechanism or treatment of dysfunction following spinal cord injury.
- Defining anatomical, pathophysiological, inflammatory, and neurochemical characteristics of spinal cord injury or disease in well defined animal models.
- Elucidating biological and physical mechanisms that improve functions compromised by spinal cord injury, including dysfunction, chronic pain, and uncontrolled spasticity. Developing strategies to prevent or treat secondary complications from injury or disease of the spinal cord.
- Developing innovative rehabilitative strategies, services, or priorities to promote recovery and function following spinal cord injury.
- Developing public education programs to help decrease the occurrence of spinal cord injury by safety education, better safety practices, and decreased alcohol use as a contributing factor.
- Developing education programs for the injured and their families.

ROUND 01 PROJECTS

A first round of eight (8) research projects was approved and awarded funds on 07/01/02 for periods ranging from 12 to 18 months. Several projects subsequently requested and received no-cost extensions as noted below.

- **SCIRF0202 Gene Expression Profiling of CNS Regions Implicated in a Mouse Model of Spinal Cord Injury** {\$85,466 for 18 months}

P.I.: Jacqueline F. McGinty, PhD, Professor, Physiology and Neuroscience, Medical University of South Carolina

- **SCIRF 0302 Statewide Outcome Assessment for Spinal Cord Injury (SOASCI): Assessing the Implementation and Effectiveness of Methylprednisolone Protocol and Other Outcomes of Spinal Cord Injury In South Carolina** {\$123,349 for 12 months, with subsequent 12 month no-cost extension}

P.I.: Stephen J. Haines, MD, Professor and Chair, Department of Neurological Surgery, Anbesaw W. Selassie, DrPH., Assistant Professor, Department of Biometry and Epidemiology, Medical University of South Carolina
- **SCIRF 0602 Assessment and Treatment of Musculoskeletal Pain in the Shoulder Girdle in SCI Through Surface-Recorded EMG and EMG Biofeedback** {\$91,990 for 18 months, with subsequent 6 month no-cost extension }

P.I.: Susan J. Middaugh, PhD, PT, Professor, Department of Anesthesia and Perioperative Medicine, Medical University of South Carolina
- **SCIRF 0802 Spinal Modulation of the Nociceptive Pressor Reflex** {\$87,978 for 18 months, with subsequent 6 month no-cost extension}

P.I.: Britt Wilson, PhD., Associate Professor, Pharmacology and Physiology, University of South Carolina School of Medicine.
- **SCIRF 1102 An In Vitro Model of the Reflex Arc as Applied to Spinal Cord Injury** {\$100,252 for 18 months}

P.I.: James J. Hickman, PhD., Hunter Endowed Chair of Biomaterials, Department of Bioengineering, Clemson University
- **SCIRF 1202 Taking Charge of Your Life”—Statewide Conference for People With Spinal Core Injuries** {\$29,476 for 12 months}

P.I.: Kermit L. Short, Executive Director, South Carolina Spinal Cord Injury Association
- **SCIRF 1302 Recruitment Assistance for James S. Krause, PhD as Chair of the Department of Rehabilitative Sciences at MUSC and Scientific Director of the SCI Research Fund** {\$125,000 for 12 months, with 5 subsequent no-cost extensions adding 60 months}

P.I.: James S. Krause, PhD., (& Danielle N. Ripich, PhD.), Chair, Department of Rehabilitative Sciences, College of Health Professions, Medical University of South Carolina
- **SCIRF 1402 Recruitment Assistance for Mark S. Kindy, PhD as The Admiral Pihl Endowed Chair of Neuroscience at MUSC and Associate Scientific Director of the SCI Research Fund** {\$75,000 for 12 months, with 3 subsequent no-cost extensions adding 36 months}

P.I.: Mark S. Kindy, PhD., (& Peter Kalivas, PhD.), Admiral Pihl Endowed Chair of Neuroscience, Department of Neurosciences, Medical University of South Carolina

ROUND 02 PROJECTS

A second round of ten (10) projects was approved on July 11, 2003 for periods ranging from 12 to 18 months and awarded funds as of September 1, 2003 or shortly thereafter.

- **SCIRF 0103 “Taking Charge of Your Life”—Continuing Education for People With Spinal Cord Injury** {\$65,000 for 12 months}

P.I.: Kermit Short, Executive Director, South Carolina Spinal Cord Injury Association

- **SCIRF 0303 Development of a Laser Cell Micropatterning System for In Vitro Investigation of Adult Stem Cell Spinal Cord Injury Treatment** {\$149,890 for 18 months, with subsequent 18 month extension and \$ 23,000 supplement; see 0303S under Round 04 below}

P.I.: Bruce Z. Gao, PhD., Assistant Professor, Department of Bioengineering, Clemson University

- **SCIRF 0403 In Vitro System to Determine Factors Promote Survival and Regeneration of Principal Neurons of the Spinal Cord** {\$74,892 for 18 months}

P.I.: Peter Molnar, PhD., Research Assistant Professor, Department of Bioengineering, Clemson University

- **SCIRF 0503 Determination of Occurrence and Causes of Death Among South Carolina Residents with Traumatic Spinal Cord Injury** {\$145,000 for 18 months, with subsequent no-cost extension adding 21 months}

P.I.: Elisabeth Pickelsimer, DA, Research Assistant Professor, Department of Biometry and Epidemiology/Rehabilitative Sciences, Medical University of South Carolina

- **SCIRF 0603 The Prevalence of Upper Quarter Pain Among Persons with Long-term Spinal Cord Injury** {\$75,000 for 18 months, with subsequent no-cost extension adding 12 months}

P.I.: David Morrisette, PT, ATC, MTC, PhD., Associate Professor, Physical Therapy Education Program, Department of Rehabilitative Sciences, Medical University of South Carolina

- **SCIRF 0703 Frequency, Severity, and Risk Factors for Falls and Fall-Related Injuries Sustained by Individuals with Incomplete Spinal Cord Injury** {\$75,000 for 18 months, with subsequent no-cost extension adding 16 months}
P.I.: Sandra S. Brotherton, PhD., Assistant Professor, Department of Rehabilitative Sciences, Medical University of South Carolina
- **SCIRF 0803 Estrogen Therapy for Spinal Cord Injury** {\$137,592 for 18 months, with 3 subsequent no-cost extensions adding 36 months}
P.I.: Swapan K. Ray, PhD., Assistant Professor, Department of Neurology, Medical University of South Carolina
- **SCIRF 0903 Therapeutic Use of Minocycline for Spinal Cord Injury** {\$24,988 for 12 months}
P.I.: Narayan R. Bhat, PhD., Professor, Department of Neurology, Medical University of South Carolina
- **SCIRF 1003 Project M.I.L.E. (Mobile Inclusion Life-Training Evaluation)** {\$3,000 seed funds for additional conceptual development, never subsequently expended}
P.I.: Michael E Godkin, Director, Disabilities Resource Center, North Charleston
- **SCIRF 1103 Anti-inflammatory Approaches for Spinal Cord Injury** {\$75,000 for 18 months}
P.I.: Ernest Barbosa, MD, Associate Professor, Departments of Neurology and Pediatrics, Medical University of South Carolina

ROUND 03 PROJECTS

A third round of seven (7) projects was approved on June 25, 2004 for periods ranging from 12 to 24 months and awarded funds as of July 1, 2004 or shortly thereafter:

- **SCIRF 0104 Biomaterial-based Gene Delivery for Spinal Regeneration** {\$150,000 for 24 months, with 2 subsequent no-cost extensions adding 18 months}
P.I.: C. Kenneth Webb, Ph.D., Assistant Professor, Department of Bioengineering, Clemson University
- **SCIRF 0204 2005 Statewide Conference for People with Spinal Cord Injury in South Carolina; And Beyond the Walls—Education Outside of Rehabilitation** {\$60,000 for 12 months}
P.I.: Kermit L. Short, Executive Director, South Carolina Spinal Cord Injury Association

- **SCIRF 0304 Home Physical Activity Program for the Promotion of Health and Wellness in Individuals with Spinal Cord Injury** {\$150,000 for 24 months, with 2 subsequent no-cost extension adding 16 months}
P.I.: Holly H. Wise, PT, Ph.D., Assistant Professor, Department of Rehabilitative Sciences, Medical University of South Carolina
- **SCIRF 0604 Patterns of Care for Spinal Cord Injury: South Carolina and the Model Systems** {\$61,632 for 12 months, with subsequent no-cost extension adding 6 months}
P.I.: David E. Murday, Ph.D., Assistant Director, Center for Health Services Policy & Research Arnold School of Public Health, University of South Carolina
- **SCIRF 0704 Telemedicine: A Lifeline for Continuity of Care for Spinal Cord Injury** {\$3,000 seed funds for additional conceptual development, never subsequently expended}
P.I.: Tracie L. Mertz, Ph.D., Clinical Psychologist, Neuropsychologist, Roger C. Peace Rehab Hospital, Greenville Hospital System
- **SCIRF 0804 Dissemination of Information Regarding Evidenced-Based Practices to Enhance Independent Lifestyles for People with Spinal Cord Injuries** {\$70,000 for 24 months , with subsequent no-cost extension adding 12 months}
P.I.: Jill Monger, P.T., MHS; Michael Godkin, Executive Director, Disability Resource Center of Charleston
- **SCIRF 1004 Bridge Funding Support for the S. C. Statewide Traumatic Spinal Cord Injury Surveillance and Registry System** {\$102,000 for 24 months, with subsequent no-cost extension adding 12 months—also see SCIRF 1004E under ROUND 07 below which provided another 6 month extension with supplemental funds}
P.I.: Anbesaw W. Selassie, DrPH., Assistant Professor, Department of Biometry and Epidemiology/Rehab. Sci., Medical University of South Carolina

ROUND 02S & 04 PROJECTS

A fourth round of three (3) fully funded and four (4) initial seed projects was approved July 01, 2005 and awarded funds on 07/01/05 and 09/01/02 for periods ranging from 3.5 to 24 months. It was anticipated that several of the seed projects could be fully funded mid-year in December after Fund Board review of revised proposals responding to concerns/suggestions arising during the initial scientific review. In addition, an earlier Round 02 project received a supplemental award. Following are the awards made based on Board decisions at its July 1, 2005 meeting:

- **SCIRF 0303S (SUPPLEMENTAL AWARD) Development of a Laser Cell Micropatterning System for In Vitro Investigation of Adult Stem Cell Spinal**

Cord Injury Treatment {\$23,000 added to the original \$149,890 for an extended period of 30 months}

P.I.: Bruce Z. Gao, PhD., Assistant Professor, Department of Bioengineering
Clemson University

- **SCIRF 0105A (SEED REDEVELOPMENT) Repetitive Movement Therapy as an Intervention for Individuals with Incomplete Spinal Cord Injury** {\$5,000 for 3.5 months}

P.I.: Stacy L. Fritz, Ph.D., PT, Clinical Assistant Professor, Department of Exercise Science, Physical Therapy Program, University of South Carolina

- **SCIRF 0205 Modulation of Inflammatory Response and Secondary Injury** {\$25,000 for 12 months, with subsequent no-cost extension adding 12 months}

P.I.: Stephen Tomlinson Ph.D., Professor, Department of Microbiology and Immunology, Medical University of South Carolina

- **SCIRF 0505A (SEED INITIATION AND REDEVELOPMENT) Engineering Regeneration Through Bridge/Host Distal Interference** {\$25,000 for 6 months, with subsequent no-cost extension adding 3 months}

P.I.: Andrew T. Metters, Ph.D., Assistant Professor, Department of Chemical and Biomolecular Engineering, Clemson University

- **SCIRF 0605 Tissue Engineering for Spinal Cord Regeneration** {\$100,000 for 24 months, with subsequent no-cost extension adding 12 months}

P.I.: Xuejun Wen, M.D., Ph.D., Assistant Professor, Clemson-Medical University of South Carolina Bioengineering Program

- **SCIRF 0705 Assessing Disparities in Patterns of Health Care After Traumatic Spinal Cord Injury** {\$119,598 for 24 Mmonths, with subsequent no-cost extension adding 12 months}

P.I.: Elisabeth Pickelsimer, DA, Research Assistant Professor, Department of Biometry and Epidemiology/Rehabilitative Sciences, Medical University of South Carolina

- **SCIRF 0805 (SEED REDEVELOPMENT) Dynamic Postural Patterns during Task Performance in Individuals with Paraplegia** {\$5,000 for 3.5 months, with 2 subsequent no-cost extensions adding 15.5 months}

P.I.: Hon K. Yuen, Associate Professor, Department of Rehabilitative Sciences, Medical University of South Carolina

- **SCIRF 1005 (SEED DEVELOPMENT) South Carolina Spinal Cord Injury Association Cooperative Study** {\$5,000 for 9 months}

P.I.: Richard F. Bridges, Executive Director, South Carolina Spinal Cord Injury Association

ROUND 04 OFF-CYCLE PROJECTS

In follow-up to decisions made at the prior July Board meeting, a mid-cycle additional review resulted in approval by the Board on 01/27/06 of three mid-cycle revised seed projects as well as two new unsolicited proposals responding to Fund priorities. They were awarded funds in February, March, or April of 2007 for Project period ranging from 12 to 36 months.

- **SCIRF 0105B Intensive Mobility Training as an Intervention for Individuals with Incomplete Spinal Cord Injury** {\$119,829 for 24 months, with subsequent no-cost extension adding 12 months}
P.I.: Stacy L. Fritz, Ph.D., PT, Clinical Assistant Professor, Physical Therapy Program, University of South Carolina
- **SCIRF 0505B Engineering Regeneration Through Bridge/Host Distal Interference** {\$120,000 for 24 months, with subsequent no-cost extension adding 11 months}
P.I.: Andrew T. Metters, Ph.D., Assistant Professor, Department of Chemical and Biomolecular Engineering, Clemson University
- **SCIRF 1005B Contract to Disseminate Results to Consumers** {\$34,602 for 12 months}
P.I.: Richard F. Bridges, Executive Director, South Carolina Spinal Cord Injury Association
- **SCIRF 1105 A Proposal to Build SCI Research Infrastructure via the Development of a Center of Interdisciplinary Spinal Cord Injury Research** {\$499,309 for 36 months}
P.I.: James Krause, Ph.D., Scientific Director SCIRF & Mark Kindy, PhD, Associate Scientific Director SCIRF, Medical University of South Carolina
- **SCIRF 1205 Bridge Funding for Role of Proteinase in Spinal Cord Injury** {\$50,000 for 12 months, with subsequent no-cost extension adding 14 months}
P.I.: Department of Neurosciences, Medical University of South Carolina

ROUND 02B & 05 PROJECTS

On 06/09/06 the Board approved the final revision of an earlier Round 02 contract proposal as well as four (4) new proposals submitted in Round 05. These were awarded funds on 07/01/06 or shortly thereafter for periods ranging from 12 to 24 months.

- **SCIRF 0102B(REVISED 2005)b The Feasibility of Enhanced Primary Rehabilitation Services in SC** {\$99,209 for 12 months}

P.I.: David E. Murday, Ph.D., Interim Director, Center for Health Services Policy & Research, Arnold School of Public Health, University of South Carolina

- **SCIRF 0206 Nanoscale Biomedical Devices for Treatment of Secondary Spinal Cord Injury** {\$100,000 for 24 months}

P.I.: Alexey Vertegel Ph.D., Assistant Professor, Department of Bioengineering, Clemson University

- **SCIRF 0406 Modulation of Astroglialosis by Statins for Spinal Cord Therapy** {\$100,000 for 24 months}

P.I.: Mushfiquddin Khan, Ph.D., Research Assistant Professor, Department of Pediatrics, Medical University of South Carolina

- **SCIRF 0506 Therapeutic Efficacy of Statin in Neuroprotection in Spinal Cord Injury** {\$80,000 for 24 months}

P.I.: Shailendra Giri, Ph.D., Research Assistant Professor, Department of Pediatrics, Medical University of South Carolina

- **SCIRF 0606 Household Composition, Care Giving Intensity and Labor Market Participation of Individuals with Spinal Cord Injury** {\$79,955 for 24 months}

P.I.: Clara E. Dismuke, Ph.D., Assistant Professor, Department of Health Administration and Policy, Medical University of South Carolina

ROUND 03E & 06 & 06A PROJECTS

On 06/27/07 the Board approved a special extension with additional funds of an earlier Round 03 project along with four (4) Round 06 proposals (two of these being in response to Board Special Initiatives) and one (1) Round 06A proposal. These were awarded funds on 07/01/07 or shortly thereafter for periods ranging from 6 to 36 months.

- **SCIRF 1004E Renewal: Bridge Funding Support for the S. C. Statewide Traumatic Spinal Cord Injury Surveillance and Registry System** {\$38,750 for 6 months with Conditions}

P.I.: Anbesaw W. Selassie, DrPH, Associate Professor, Department of Biostatistics, Bioinformatics, and Epidemiology, Medical University of South Carolina

- **SCIRF 0307 Biophysical Modeling of Spinal Cord Under Mechanical Loading** {\$100,000 for 24 months}

P.I.: Hai Yao, Ph.D., Assistant Professor, Clemson—MUSC Bioengineering Program

- **SCIRF 0607 Melatonin as a Therapy for Spinal Cord Injury** {\$79,793 for 24 months}

P.I.: Abhay Varma, M.D., Instructor, Department of Neurosurgery, Medical University of South Carolina

- **SCIRF 0707 (RFP 6A) Phanor L. Perot, Jr. Endowed Chair in Spinal Cord Injury** {\$500,000 Provisional for 36 months, and Permanent Endowment if Conditions are Met}

P.I.: Sunil J. Patel, M.D., Clinical Chair, Department of Neurosciences, Medical University of South Carolina

- **SCIRF 0807 Conference: An Interdisciplinary Approach to Spinal Cord Injury Management** {\$25,040 for 12 months, with subsequent no-cost extension for 6 months}

P.I.: Nancy C. Wolf, Program Manager, Roger C. Peace Rehabilitation Hospital, Greenville Hospital System

- **SCIRF 0907 State Spinal Cord Injury Conference: Needs Assessment and Planning Process** {\$4,985 for 6 months}

P.I.: Acting Director, South Carolina Spinal Cord Injury Association

ROUND 07 PROJECTS

The Board approved four new proposals and an additional year of funding for the surveillance system. These were awarded funds on 07/01/07 or 07/01/08 for periods ranging from 12 to 24 months. The board also agreed to fund the state surveillance system on an ongoing basis, pending annual applications and reasonable accomplishments.

- **SCIRF 0108 Myelin Regulation in the Spinal Cord Following PAR-1 Activation** {\$25,745 for 12 months}

P.I.: Victoria L Turgeson, Ph.D., Assistant Professor of Biology, Biology Department, Furman University, 3300 Poinsett Highway, Greenville, SC 29613 (T)864-294-3791; (F)864-294-2058; (E)victoria.turgeon@furman.edu. **TYPE APPLICATION:** Pilot Project

- **SCIRF 0408A1 Biodegradable3 Scar-Inhibiting Implant for Guided Spinal Cord Regeneration** {\$100,000 for 24 months}

P.I.: Esmail Jabbari, PhD, Associate Professor of Chemical & Biomedical Engineering, Swearingen Engineering Center, RM2C11, University of South Carolina, Columbia, SC 29298 (T)903-777-8022; (F)803-777-8265; (E)jabbari@engr.sc.edu. **TYPE APPLICATION:** Primary Grant

- **SCIRF 0808 MRI Evaluation of Altered Inflammatory Response in SCI** {\$25,000 for 12 months}

P.I.: Mehmet Bilgen, Ph.D., Associate Professor, Department of Radiology, 19 Hagood Ave., Suite 6061, Medical University of South Carolina, PO Box

250322, Charleston, SC 29425 (T)843-792-3838; (F)843-792-6447;
(E)orsp@musc.edu. **TYPE APPLICATION:** Pilot Project

- **SCIRF 1004 Bridge Funding Support for the S. C. Statewide Traumatic Spinal Cord Injury Surveillance and Registry System**
{ \$102,000 for 24 months, with subsequent no-cost extension adding 12 months—also see SCIRF 1004E under ROUND 07 below which provided another 6 month extension with supplemental funds }

P.I.: Anbesaw W. Selassie, DrPH., Assistant Professor, Department of Biometry and Epidemiology/Rehab. Sci., Medical University of South Carolina

SUMMARY OF PROGRESS

Between July 1, 2002 and May 29, 2009, the Fund obligated a total of \$4,584,998.96 (\$221,211.97 in Administration/Other; \$307,491.58 in Research Development; and \$ 4,056,295.41 in Funded Projects). These obligations covered Administration and Scientific Development through 06/1/09, and will cover all of the projects until they end. The Fund is expected to continue collections at a rate of approximately \$61,000 per month as well as reclaim additional unexpended funds at year-end from various budget components.

Although it is impossible to identify all the contributions of the SCI fund to SCI research around the state, we have noted several highlights:

- Development of infrastructure that includes needed equipment for animal research, as well as motion analysis technology that bridges the gap between basic animal science studies and those with humans.
- Five conferences have been conducted to date, including two scientific conferences, two consumer-based conferences, and a conference targeted at service providers.
- Investigators have documented 154 published manuscripts in refereed journals that have either been directly supported by the SCI research funds or have been indirectly supported by virtue of support to the recruitment of the investigators to the state of South Carolina.
- Investigators have also made more than 224 presentations at professional conferences on projects funded either directly or indirectly as a result of grants from the SCI fund.
- Multiple federal and private grants have been brought into the State of South Carolina as a result of seed funds from the SCI fund.

FUTURE GOALS

Fund goals have been and will continue to be driven by the needs of people with SCI in the State of South Carolina. Following are main ongoing focus areas:

- Review/explore opportunities to support a broad range of research projects that will address the needs of people with SCI in the state, similar to those that have been

done previously with respect to access to care, life expectancy, and needs for rehabilitation.

- Evaluate the most effective ways of supporting SCI research throughout the state. We are explicitly considering options for funding an integrated center that will provide infrastructure for collection of pilot data, access to larger national data sets as a prelude to grant funding and an alternative to more expensive primary data collection, and performance novel research.
- The Fund is constantly seeking better models that provide a greater impact within our resources to promote our understanding and the well-being of those with spinal cord injuries. One model that may be worth replicating is a program established at the University of Kentucky. This model was highlighted during the second South Carolina Spinal Cord Injury Research Fund (SCIRF) Scientific Conference, where more than 60 physicians, researchers and advocates from across South Carolina gathered on May 30, 2008 to learn how Kentucky established and maintained its successful spinal and brain injury programs. Kentucky, which has a similar socio-economic profile as South Carolina, also has the nation's most mature spinal cord injury program dating back to 1997, and is funded in part by speeding tickets and court fees. South Carolina's eight-year-old program is funded through fines collected from drunk driving offenses. The featured speaker was Edward Hall, M.D., Ph.D., director of the Spinal Cord and Brain Injury Research Center, University of Kentucky (UK). Dr. Hall discussed his state's progress that included the establishment of Kentucky's Spinal Cord Injury Research Trust in 2002. Collaborations with University of Louisville researcher Christopher Fields, M.D., and Kentucky State Sen. Tim Shaughnessy led to the establishment of the Kentucky Spinal Cord & Injury Research Trust, which funds programs at the University of Louisville and at UK for neurotrauma research.
- We will continue to look for ways to fund education based on SCI research, including that funded by the SCI fund, as well as by the federal government and other lending agencies. A primary example of this type of educational effort was the scientific conference that was held this past year at the Medical University of South Carolina. The keynote speaker, Edward Hall Ph.D., was inducted into the SCI Hall of Fame for his work in basic science.
- We will continue to meet with state legislators regarding larger clinical and rehabilitative issues, particularly those that are related to the special initiatives of the SCI fund. In particular, this includes research on the feasibility of in-patient rehabilitative care and needs for more inpatient beds.
- Extensive efforts will be made to better link resources around the state. Particular effort will be given to bring investigators to gather into working groups in order to share knowledge, generate ideas, and facilitate SCI research throughout the state.

SUMMARY OF SCIENTIFIC CONFERENCE



On May 30, 2008, the 2nd Scientific Conference of the SCI fund was presented. It was attended by 60 physicians, researchers and advocates from across South Carolina who gathered at the MUSC Storm Eye Institute Auditorium. Participants came to learn about a model program in

Kentucky that has successfully managed to maintain spinal and brain injury programs. The keynote speaker, Edward Hall, MD, Ph.D., is the Director of the Spinal Cord and Brain Injury Research Center in Kentucky. His keynote address was entitled: "The Development, Growth, and Organization of Neurotrauma Research in Kentucky."

Dr. Brian Cuddy, Chairman of the Board of Directors of the SCI Fund, opened the conference with an update of activities from the research fund and a welcome for the keynote speaker. Dr. Hall's keynote presentation was next, followed by a presentation by Dr. David Murday regarding the needs for in-patient hospital beds in the State of South Carolina designated for SCI. Dr. Murday, a health economist at the University of South Carolina, based his presentation on his investigation of the needs of South Carolinians with SCI, a study that was funded by the SCI research fund. The scientific directors, Dr. James Krause and Dr. Naren Banik, updated the work of the Center for Interdisciplinary Spinal Cord Injury Research, a center that was developed to build infrastructure to support SCIRF in South Carolina. Lastly, there was a panel discussion of key stakeholders from around the state of South Carolina regarding the future of the SCI Fund.

PART II, PROGRAM/BUDGET HIGHLIGHTS

CHRONOLOGICAL HIGHLIGHTS OF FYs 07-09

Walker Coleman, the SCIRF's Founding Administrator, passed away unexpectedly in July of 2008. The actual writing of the Annual 2007-2008 Report had not begun. Recognizing that the fiscal year had just ended and a few months are required for review and official audits, it is typical to have annual reports delayed for a few months after the end of the fiscal period. This was further complicated with Walker's passing in that there was no apparent heir to write the annual report.

For the remainder of 2008 and the start of 2009, Kenneth (Gene) Singletary in MUSC's Office of Grants and Contracts Accounting and Darren McCants in MUSC's Office of Research and Sponsored Programs, provided their time and effort unselfishly to continue the necessary administrative work in providing oversight of the approved projects. These two individuals deserve our thanks for this period when the Fund's Administrator position was vacant. Fortunately, they are continuing their key roles of providing fiscal oversight for approved awards for our Fund.

Sometime in early 2009, Dr. Greenberg recommended that Dr. Tom Higerd assume the role of SCIRF Administrator. Following the Board acceptance of the President's recommendation, he was appointed. It was decided that this two-year Report would be appropriate considering the circumstances.

The unexpected absence of the Fund's Administrator, particular a person as outstanding and as dedicated as Mr. Coleman, provided an unscheduled moment to pause and reflect on past activities. Of particular interest was to make an assessment of how effective was the Fund in carrying out its mission despite its apparent effectiveness. Was there a possibility to achieve even more effective uses of our limited financial resources. This period of reflection was not a distraction in administering the approved projects, thanks to Gene and Darren; instead, it provided that rare window to step back and consider new approaches and initiatives.

One of the initiatives brought forward was the change in reporting from a calendar year (January 1 to December 31) to the typical fiscal year (July 1 to June 30) bringing SCSCIRF reporting in line with our State government and its agencies. Another decision was to undertake the development of a broad-based, five-year strategic plan. In addition, a discussion has ensued on how the Fund can enhance the work involving a surveillance system to indentify all instance of spinal cord injury in South Carolina as a means to develop a more integrated approach to understanding and improving the health care of our citizens with spinal cord injuries. Discussions have also focused on an endowed chair to assist in the recruitment of a qualified candidate who has national recognition and a proven academic record in spinal cord injury. More detailed statements on these subjects will be forthcoming in the next Annual Report.

BUDGET DISCUSSION

Fiscal Year 09 was the seventh full year of research project activity with final budget and actual expenditures as follows:

NOTE: This draft includes all known possible expenditures and commitments of new monies during the year based on actions of the Fund Board at its regularly held meetings and any subsequent actions that were communicated via email.

Spinal Cord Injury Research Fund
Financials Statement Overview
for all Fiscal Years through June 30, 2009

Income

Collections from prior years (FY 01-07)	4,605,230.93
Collections from 7/1/07 through 06/30/09	1,629,473.89
Total Income:	6,234,704.82

Expenses

Administrative Core Expenses from prior years (FY 03-07)	160,638.43
Administrative Core Expenses from 7/1/07 through 06/30/09	<u>60,573.54</u>
Subtotal:	221,211.97
Carryover Research and Development Expenses from prior period (FY 03-07)	177,130.62
Research and Development Expenses from 7/1/07 through 06/30/09	130,060.96
Subtotal:	307,191.58
Project Expenses from prior period (FY 03-07)	2,690,161.06
Project Expenses from 7/1/07 through 06/1/09	<u>1,366,134.37</u>
Subtotal:	4,056,295.41
Total Expenses:	4,584,698.96
Net:	1,650,005.86

PART III, RESEARCH HIGHLIGHTS (Report of Scientific Directors)

ESTABLISHING AN ENDOWED CHAIR

The Board of Directors of the South Carolina Spinal Cord Injury Research Fund developed and issued a special request for proposals to establish an Endowed Chair in Spinal Cord Injury Research in the State. As the year ended, they awarded \$500,000 for the recruitment of the Phanor L. Perot, Jr. Endowed Chair in Spinal Cord Injury to Dr. Sunil Patel of the Department of Neurosciences at the Medical University of South Carolina.

A search committee consisting of basic scientists and clinicians from the Departments of Neurosciences (Neurology, Neurosurgery, and Physiology), Radiology, Pediatrics, and the College of Health Sciences, as well as Board members from the Spinal Cord Injury Research Fund (SCIRF), has been formed. An advertisement for this position was posted in November 2008, in several different journals. Dr. Banik is serving as chair of this committee.

BROAD OVERVIEW/SUMMARY OF PAST ACCOMPLISHMENTS AND ANTICIPATED FUTURE DIRECTIONS

Constantly moving forward in promoting a research agenda, the Fund will continue to support projects submitted by investigators from around the State through the competitive process of grant submission and peer review. This is consistent with the ongoing goal of enhancing the quality of research in spinal cord injury throughout the State, as well as increasing the number of investigators performing this research. Priority will be given to young investigators who are first-time applicants.

Whereas the open call for proposals ensures that novel ideas are reviewed and funded as appropriate, in order to further address its research goals and agenda, the Fund intends to additionally invest in broader special initiatives that concentrate on areas of greatest need. The Board of Directors, with the recommendations of the Scientific Directors, have placed great emphasis on several initiatives including the endowed chair, the Center for Interdisciplinary SCI Research, evaluation of rehabilitation needs within the State, and the proposed conference for care providers. Such initiatives will continue to be dictated by the need to move the SCI agenda forward. Whereas individual projects move the Fund with relatively small steps, these larger projects allow the Fund to move forward in a more integrated manner.

In the future, particular focus will be placed on establishing a statewide Center for interdisciplinary research.

ACCOMPLISHMENTS OF GRANTEES

The following section represents the accomplishments of grantees related directly or indirectly to their grant awards. We have documented

several areas of accomplishment including funded grants in SCI, funded grants in other areas, and grant submissions in SCI that were not funded as well as publications, and presentations. The reason that some of the accomplishments do not directly relate to SCI is that some of grants support methodologies that primarily apply to SCI, but may have applications in medicine. All investigators have conducted their work directly in SCI. We are pleased that some grants have laid a foundation for broader accomplishments and that some investigators have gone on and pursued additional work in additional areas of focus after completing their SCI work.

All information is based on the reports of the investigators. Therefore, we have not independently verified the accuracy of the references. Some estimates are based on initial acceptance of manuscripts and may not contain all final publication information. Similarly, some information from funded grants, particularly budget amounts, are estimated based on initial awards and can change in subsequent years.

Grants Funded: Spinal Cord Related grants

1. **Banik, N.L. (Principal Investigator), Ray, S.K. (co-Principal Investigator)**, The role of proteinase in spinal cord injury (RO1, NS-31622), NIH/NINDS, \$1,152,025, 2001-2006.
2. **Banik, NL. (Principal Investigator), Ray, SK (co-Principal Investigator)**, Involvement of spinal cord in MPTP_induced parkinsonism, National Institutes of Health, 2005-2007.
3. **Banik, N.L. (Principal Investigator) Ray, S.K. (co-Principal Investigator)**, Attenuation of axonal damage and neuronal death in EAE (RO1, NS-56176), NIH/NINDS, \$1,825,000, 2006-2011.
4. **Bhat, N (Principal Investigator) & Kindy, MS (Co-Principal Investigator)** Neuroinflammation in cholesterol-induced AD pathogenesis, 1 RO1 NS-01, \$225,000, 7/1/06-11/30/11.
5. **Gao, B.Z. (Co-Principal Investigator)** Automatic Multiple Beam Laser Cell Micropatterning System, Clemson University Research Instrumentation Equipment Grant, \$50,000, 04/16/04-08/15/04.
6. **Hickman, J. (Principal Investigator) & Kindy, M.S. (co-Principal Investigator)** An In Vitro Model of Stem Cell Innervation of Myotubes NIH, 1 R01 NS050452-01A1, \$499,580 (\$2,000,000 total), 8/15/05-8/14/10.
7. **Hickman, J. (Principal Investigator) & Kindy, M.S. (co-Principal Investigator)** In Vitro Model of the Reflex Arc for Spinal Disorders, NIH, \$3,750,000 Total, 8/15/05-8/14/10.
8. **Kindy, MS (Principal Investigator)** Expectatory and Anticipatory Behavior in Natural and Artificial Intelligence Systems, SC EPSCoR, \$75,000, 4/1/05-7/31/06.

9. **Kindy, MS. (*Principal Investigator*)** Oxidized Lipoproteins in Neurodegeneration. NIH 1.152 M (Total) 08/15/01-8/31/07
10. **Kindy MS. (*Principal Investigator*)** The Role of Neprilysin in Alzheimer's Disease, NIH 1.05 M (Total) 04/01/02-11/30/07.
11. **Kindy, MS (*Principal Investigator*)** Neprilysin and Amyloid-beta-degradation in Alzheimer's disease, VA Merit Review, \$85,000/yr (\$125,000/yr from 4/1/06), 4/1/02-3/31/10.
12. **Kindy, MS (*Principal Investigator*)** South Carolina Commission on Education – Center of Economic Excellence in Neuroscience Research, \$6,000,000 Total, 7/01/03-6/30/07
13. **Kindy MS (*Principal Investigator*)** South Carolina Spinal Cord Injury Fund, \$75,000, 8/1/02-7/31/07.
14. **Kindy MS (*Principal Investigator*)** Research Career Scientist, VA Career Scientist Award, \$85000/yr (salary only), 4/1/03-3/31/09.
15. **Kindy, MS (*Principal Investigator*)** MUSC/NSF EPSCoR Minority Undergraduate Research Program, SC EPSCoR \$30,000, 4/01/06-3/31/07.
16. **Kindy, MS (*Principal Investigator*)** Phenomics Center, \$75,000/yr, 7/1/05-6/30/08.
17. **Kindy, MS (*Principal Investigator*)** RAGE and Ab induced Oxidative Stress, VA, \$250,000 Total, 09/01/05-08/31/07.
18. **Kindy, MS (*Principal Investigator*)** MELATONIN- A NEW ANTI-AMYLOIDOGENIC & ANTIOXIDANT AGENT, NIH/NIA, \$200,000(Total/year) 7/1/06-6/30/07.
19. **Kindy, MS (*Principal Investigator*)** Therapeutic Intervention in Cervical Spinal Cord Injury, Department of Veteran's Affairs, \$125,000/yr, 10/1/07-9/30/11.
20. **Kindy, M.S. (*Principal Investigator*)** EPSCoR Phenomics Center for Neuroscience Research, NSF, \$1,200,000, 06/01/05-05/31/08.
21. **Krause, J.S. (*Principal Investigator*)** A 6-Year Longitudinal Study of Community Integration, Subjective Well-Being, and Health after Spinal Cord Injury: Relationship with Gender, Race/Ethnicity, and Environmental Factors, National Institute on Disability and Rehabilitation Research, Department of Education; \$449,515, 9/1/02-8/31/06
22. **Krause, J.S. (*Principal Investigator*)** Mortality Rates and Causes of Death in the First Decade After Spinal Cord Injury Onset: A Comparative Study of Veterans and Non-Veterans, Veteran's Administration (VISN-7), \$116,000, 7/03-7/05.

23. **Krause, J.S. (Principal Investigator)** Stability of Vocational Interests Two Years after Spinal Cord Injury: Relationship with Employment, Participation, and Subjective Well-Being, National Institute on Disability and Rehabilitation Research, Department of Education; \$444,209, 10/01/03-9/30/06.
24. **Krause, J.S. (Principal Investigator)** Risk for Early Mortality After Spinal Cord Injury, National Institute on Disability and Rehabilitation Research, Department of Education; \$449,944, 10/01/03- 9/30/06.
25. **Krause, J.S. (Principal Investigator)** Risk for Adverse Outcomes after SCI: A Longitudinal Study. R01, National Institutes of Health; \$2,098,101, 01/01/06-12/31/11.
26. **Krause, J.S. (Principal Investigator)** Risk for Adverse Health Events after SCI: A Longitudinal Study of 1,391 participants, National Institute on Disability and Rehabilitation Research, Department of Education, \$449,990, 12/01/05-11/30/08.
27. **Krause, J.S. (Principal Investigator)** A Longitudinal Study of Risk for Hospitalizations, Pressure Ulcers, and Subsequent Injuries after Spinal Cord Injury. Field Initiated Research Grant, *National Institute on Disability and Rehabilitation Research, Department of Education*; \$449,990, December 1, 2005 to November 30, 2008.
28. **Krause, J.S. (Principal Investigator)** Participation, Subjective Well Being, Health, and Spinal Cord Injury: A 35-Year Longitudinal Study. Field Initiated Research Grant, *National Institute on Disability and Rehabilitation Research, Department of Education*; \$449,887, December 1, 2006 to November 30, 2009.
29. **Krause, JS (Project Director/Principal Investigator)**, Saunders L (*Principal Investigator*) Center on Health Outcomes Research and Capacity Building for Underserved Populations with SCI and TBI: Race-ethnicity and risk of adverse health outcomes after spinal cord injury: A multisite collaborative study, Disability Rehabilitation Research Project, *National Institute on Disability and Rehabilitation Research, Department of Education*; \$1,766,667, 10/1/08-9/30/13.
30. **Metters, A. (Principal Investigator), Webb, K. (co-Principal Investigator)** Engineering regeneration through the distal bridge/host interface, South Carolina Spinal Cord Research Foundation, \$25,000. 8/05-12/05.
31. **Metters, A. (Principal Investigator), Webb, K. (co-Principal Investigator)** Engineering regeneration through the distal bridge/host interface, South Carolina Spinal Cord Research Foundation, \$120,000, 6/06-6/08.
32. **Molnar, P. (co-Principal Investigator)** An In Vitro Model of Stem Cell Innervation of Myotubes, NIH/NIBIB, 2005-2007.

33. **Molnar, P. (*Principal Investigator*)** Engineered Neuronal Networks for Drug Screening, (K01 career development grant), NIH/NIBIB, 2004-2009.
34. **Obeid, L (*Principal Investigator*) & Kindy, MS (*Co-Principal Investigator*)** Center of Biomedical Research Excellence in Lipidomics and Pathobiology, NIH COBRE 5P20RR017677-04, Obeid-\$1,000,000/yr, Kindy-\$150,000, 9/26/02-09/01/12.
35. **Ray, S.K. (*Principal Investigator*)** Estrogen therapy for spinal cord injury (SCIRF-0803), South Carolina Spinal Cord Injury Research Foundation, \$137,592, 2003-2007.
36. **Ray, S.K. (*Principal Investigator*)** Differentiation and apoptosis in malignant neuroblastoma (R01, NS-57811), NIH/NINDS, \$1,460,000, 2006-2010.
37. **Ray, S.K. (*Principal Investigator*)** Proteolytic control of glioblastoma, (R01, CA-91460), National Cancer Institute of NIH, \$85,331, 6/1/08-5/31/09 (no cost extension).
38. **Tomlinson, S (*Principal Invsestigator*) & Kindy, MS (*Co-principal Investigator*)** Controlling complement in cerebral ischemic injury, 1 R01 HL082485-01, \$225,000, 12/01/05-11/30/10
39. **Tomlinson, S. (*Principal Investigator*)**. Therapeutic intervention in cervical spinal cord injury, VA Research Grant, \$450,000, 5/1/08-9/30/11.
40. **Vertegel, A. (*co-Principal Investigator*)** Acquisition of a Microsystem Analyzer for Integrated Research and Education in Dynamic Analysis, Surface Topography, and Characterization of Active Microstructure, NSF, \$280,000, 8/15/06-7/31/20.
41. **Vyavahare, N. (*Principal Investigator*)** Automatic Multiple Beam Laser Cell Micropatterning System, Clemson University, \$35,000, 10/04-9/05.
42. **Webb, K. (*Principal Investigator*)** Development of cyanoacrylate/polyethylene glycol diacrylate blends as internal tissue adhesives, Spartan Medical, \$100,000, 9/1/05-9/1/06.
43. **Webb, K. (*Principal Investigator*)** Cyanoacrylates as internal adhesives, Spartan Medical Associates, LLC, \$148,000, 9/05-12/06.
44. **Wen X (*Principal Investigator*)** A Tissue-Engineered Multifilament Entubulation Bridging Device For The Treatment Of Spinal Cord Injury, Wallace H. Coulter Foundation, Early Career Translational Research Award in Biomedical Engineering, 2005-2008.
45. **Wen X (*Principal Investigator*)** Tissue engineering in spinal cord regeneration. NIH/NINDS, 2007-2012.

46. **Yao, H. (Principal Investigator), Kindy, MS. (co-Principal Investigator)** Biophysical Modeling of Spinal Cord under Mechanical Loading Biophysical Modeling of Spinal Cord under Mechanical Loading, South Carolina Spinal Cord Injury Research Fund, \$100,000, 6/2007-5/2009.

Grants Funded: Non-Spinal Cord Related Grants (Funds from SCSCIRF helped obtain these funds)

1. **Boland, T. (Principal Investigator) Gao, B.Z. (co-Principal Investigator)** BBSI in Biomaterials Science and Engineering Program, NSF and NIH, \$15,000, 1/07-12/10.
2. **Fritz, SL (Principal Investigator)** Examining Differences in Outcomes for Intensive Mobility Training Compared to Locomotor Training in Chronic Stroke, American Heart Association National Center Research Program, Scientist Development Grant, \$280,000, 7/2008-6/2012.
3. **Gao, B.Z. (Principal Investigator)** A Novel Laser Diagnostic System for Early Detection of Cancer Cells, the Oak Ridge Associated Universities (ORAU), \$10,000, 06/04 – 11/05.
4. **Gao, B.Z. (Principal Investigator)** A Novel Laser Diagnostic System for Early Detection of Cancer Cells, DOE via Oak Ridge Associated Universities (ORAU), \$5,000, 06/04 – 5/05.
5. **Gao, B.Z. (Co-Investigator)** 3-D Test Systems: New Tools for Unlocking the Mysteries of Breast Cancer, Department of Defense, \$250,000, 01/01/2005 - 12/31/2009.
6. **Gao, B.Z. (Principal Investigator)** Laser Cell Micropatterning to Study Electrical Coupling between Cardiac Fibroblasts and Myocytes, American Heart Association, \$120,000, 07/01/2005 - 06/30/2007.
7. **Ray, S.K. (Principal Investigator)** Proteolytic Control of Glioblastoma R01 (CA-91460), National Cancer Institute of the National Institutes of Health Award Period, \$1,095,000, 2003-2008.
8. **Vertegel A. (Principal Investigator)** Nanodevices for dissolution of blood clots (AHA 0765323U), American Heart Association, Mid-Atlantic division, \$132,000, 7/1/07-6/30/09.
9. **Wen X (Principal Investigator)** A novel space-creation concept to enhance the survival and functionality of transplanted human stem cells, NSF Early CAREER Award, 2008-2013.
10. **Yao, H. (Principal Investigator)** Electromechanical and Transport Properties of Human Spine IVD, Young Investigators Research Award, AOSpine North America, 7/01/07-6/30/09.
11. **Yao, H. (Project Principal Investigator)** Fluid and Solute Transport in Human TMJ disc, NIH/NCRR, 7/01/07-6/30/12.

Grants Submitted: Spinal Cord Related Grants

1. Banik, N.L. (*Principal Investigator*) & Ray, S.K. (*Co-Principal Investigator*) Involvement of spinal cord in MPTP-induced parkinsonism, National Institutes of Health, 2005-2007.
2. Banik, N.L. (*Principal Investigator*) & Ray, S.K. (*Co-Principal Investigator*)
3. Involvement of spinal cord in MPTP-induced parkinsonism (RO1), National Institutes of Health/ NINDS, \$1,825,000, 2007-2009. (Pending)
4. Barbosa, E. (*Principal Investigator*) Atorvastatin enhances Neuronal Regeneration and Remyelination following Spinal Cord Injury. National Institutes of Health, 2005-2009.
5. Bilgen M, (*Principal Investigator*), Khan M (*Co-Principal Investigator*) Drug Screening using Magnetic Resonance Imaging for spinal Cord Injury,(R01), NIH, submitted 3/2008.
6. Frankel B.M. (*Principal Investigator*), Ray, S.K. (*Co-Investigator*) Gliomagenesis: Understanding and targeting the origin of glioblastoma multiforme, CTSA Innovative Collaborative Translational Pilot Projects at MUSC, \$50,000, 2007-2008. (Pending)
7. Fritz, S.L. (*Principal Investigator*), Booster sessions of intensive mobility training for individuals with incomplete spinal cord injury, South Carolina Spinal Cord Injury Research Fund, \$100,000, submitted 2/2008. (Pending)
8. Gao, B.Z. (*Principal Investigator*) Laser Cell Micropatterning to Study the Formation of a Neuronal Circuit on MEA, NSF-CAREER, \$459,943, 02/01/06 - 01/31/11. (Not funded)
9. Gao, B.Z. (*Principal Investigator*) Laser Cell Micropatterning to Study the Formation of a Neuronal Circuit on MEA, NSF-CAREER, \$423,269, 3/07-2/12. (Not funded)
10. Gao, B.Z. (*Principal Investigator*) Nanosensors for Feedback Control of Micropatterned Neuromuscular Junctions, NSF-NER, \$160,000.
11. Gao, B.Z. (*Principal Investigator*) Development of a Laser Cell Micropatterning Microscope Based on Optical Force, NSF-MRI, \$321,497, 10/05-9/08. (Not funded)
12. Gao, B.Z. (*Principal Investigator*) Laser Patterned Hybrid Interface for in vitro 3D Neuronal Network Construction, DoD-SCEPSCoR, \$750,000, 5/06-4/09. (Not funded)
13. Gao, B.Z. (*Principal Investigator*) Laser Micropatterned Cardiac cell coculture to model scar formation following myocardial infarction, American Heart Association, Mid-Atlantic Affiliate, \$131,642, 7/04-6/06. (Not funded)
14. Gao, B.Z. (*Principal Investigator*) Development of a Novel Laser Micropatterning System for 3D Neuron-Glia Coculture Research, DOD-EPSCoR, \$750,000, 3/05-2/08. (Not funded)

15. Gao, B.Z. (*Principal Investigator*) Development of a Laser Cell Micropatterning Technique for 3D Neuron Network Construction, NSF-CAREER, \$500,000, 3/05-2/10. (Not funded)
16. Gao, B.Z. (*Principal Investigator*) Pathways to the Development of Nanosensor based Neural Prostheses, NSF-NER, \$150,000, 9/05-8/06. (Not funded)
17. Gao, B.Z. (*Principal Investigator*) Myocyte Hypertrophic Response to Mechanical Force Generated by Fibroblast, American Heart Association, \$264,000, 7/06-6/10. (Not funded)
18. Gao, B.Z. (*Principal Investigator*) Programmable Bench Top Laser-Guided Cell Patterning Microscope, NIH-R21, \$547,600, 10/06-9/09. (Not funded)
19. Gao, B.Z. (*Principal Investigator*) Differentiation of Bone Marrow Stem Cells in a Laser Patterned Myocyte Coculture, NIH-K25, \$1,068,613, 9/07-8/12. (Pending with a fundable score)
20. Gao, B.Z. (*Principal Investigator*) Stem Cell Myocyte Electrical Coupling via a Laser Patterned Cell Bridge, NIH-COBRE, \$450,000, 1/08-12/11. (Pending)
21. Gourdie, R (*Principal Investigator*) Gao, B.Z. (*co-Principal Investigator*) Patterning of Gap Junction Coupling in the Developing Heart, NIH-RO1, \$73,200 10/06-9/08, (Not funded)
22. Kindy, M.S. (*Principal Investigator*) In Vitro Model of the Reflex Arc for ALS, Bioengineering Research Partnership at NIBIB and NINDS, NIH, \$250,000/year, 7/1/06 6/30/11.
23. Kindy, MS (*Principal Investigator*) Role of AGE receptors in Alzheimer's Disease, NIH/NIA, \$250,000 (Total/year), 12/1/06-11/30/11. (Pending)
24. Kindy, MS (*Principal Investigator*) Therapeutic Intervention in Cervical Spinal Cord Injury, VA, \$125,000, 4/1/07-3/31/11. (Submitted)
25. Kindy, MS (*Principal Investigator*) Therapeutic Intervention in Cervical Spinal Cord Injury, NIH, \$250,000, 4/1/07-3/31/12. (Submitted)
26. Kindy, MS (*Principal Investigator*) Therapeutic Intervention in Cervical Spinal Cord Injury, Dept of Defense \$150,000, 4/1/07-3/31/11. (Submitted)
27. Krause, J.S. (*Principal Investigator*) Rehabilitation Research and Training Center on Psychological Aspects of Aging with a Disability, United States Department of Education, \$3,612,163, 10/1/03-09/30/08.
28. Krause, J.S. (*Principal Investigator*) Risk for Adverse Health Outcomes After Spinal Cord Injury: A Longitudinal Study of 1,391 Participants, United States Dept. of Education, \$308,217, 8/1/04-7/31/09.
29. Krause, J.S. (*Principal Investigator*) Personality, Behavior, and Coping After Spinal Cord Injury, National Institutes of Health, \$1,250,000, 8/1/04-7/31/09.
30. Krause, J.S. (*Principal Investigator*) Risk of Adverse Outcomes After Spinal Cord Injury: A Longitudinal Study, National Institutes of Health, \$1,900,484, 1/1/05-12/31/09.

31. Krause, J.S. (*Principal Investigator*) Participation, Subjective Well-being, Health, and Spinal Cord Injury: A 33-year Longitudinal Study, United States Department of Education, \$449,989, 10/1/05-9/30/08.
32. Krause, J.S. (*Principal Investigator*) Disparities in Earnings from Gainful Employment After Spinal Cord Injury: Environmental Factors and Job Accommodations, National Institutes of Health, \$2,967,312, 1/1/06-12/31/10.
33. Krause, J.S. (*Principal Investigator*) Early Risk for Mortality After Spinal Cord Injury, National Institutes of Health, \$2,967,312, 1/1/06-12/31/10.
34. Krause, J.S. (*Principal Investigator*) Early Risk for Mortality After Spinal Cord Injury, National Institute of Health, \$2,666,994, 10/1/06-9/30/11.
35. Markwald, R. (*Principal Investigator*) Gao, B.Z. (*co-Principal Investigator*) Engineering in vitro Human Cardiac Drug Toxicity Assay, \$434, 623, 1/07-12/11. (Not funded)
36. Molnar, P. (*Principal Investigator*) Axonal outgrowth on protein patterns: a test system for spinal cord regeneration, NIH/NIBIB, 2004. (Not funded)
37. Ray, S.K. (*Principal Investigator*) Cell Death Mechanisms and Therapeutic Strategies in SCI R21, National Institutes of Health, 2005-2007.
38. Ray, S.K. (*Principal Investigator*) Photodynamic therapy (PDT) and paclitaxel nanotechnology (PNT) for treating brain tumor, NASA EPSCoR Partnership Program 2005-2006.
39. Ray, S.K. (*Principal Investigator*) Photodynamic therapy (PDT) and paclitaxel nanotechnology (PNT) for treating brain tumor, NASA EPSCoR Partnership Program, \$50,000, 2007-2008. (Pending)
40. Ray, S.K. (*Principal Investigator*) Apoptosis and therapeutic strategies in SCI (RO1), NIH/NINDS, \$1,825,000, 2007-2009. (Pending)
41. Singh I (*Principal Investigator*), Khan M (*co-Principal Investigator*) Remyelinating Mechanisms in Spinal Cord Injury, (R01), NIH, submitted 10/2008.
42. Thomas, K.J. (*Principal Investigator*) Wise, H.H. (*co-Principal Investigator*) Peer versus Professional Support in Home-based Physical Activity, Christopher Reeve Foundation, \$25,000. (under review)
43. Varma, A. (*Principal Investigator*) & Ray, S.K. (*co-Principal Investigator*) Melatonin as a Therapy for Spinal Cord Injury, South Carolina Spinal Cord Injury Research Foundation (SCIRF-0905), 2006-2008.
44. Varma, A. (*Principal Investigator*) & Ray, S.K. (*co-Principal Investigator*) Melatonin as a Therapy for Spinal Cord Injury, South Carolina Spinal Cord Injury Research Foundation (SCIRF-0905), \$80,000, 2007-2009. (Pending)
45. Vertegel, A. (*Principal Investigator*) Design of Nanoscale Vascular Cleaners, NSF-CAREER, \$400,002. 3/1/07-2/28/12. (Not funded)

46. Vertegel, A. (*co-Principal Investigator*) In Vitro and In Vivi Evaluation of Adhesin-Specific Nanoparticles for the Removal of Campylobacter Jejuni from Poultry, USDA, \$487,053, 10/1/06-9/30/09. (Not funded)
47. Vertegel, A. (*Principal Investigator*) Collaborative Research: Nanoelectromechanics of Biomolecular Systems, NSF, \$173,395, 5/1/07-4/30/10. (Pending)
48. Vertegel, A. (*Principal Investigator*) Nanoelectromechanics of Vascular Smooth Muscle Cells, NSF, EFRI CBE Preliminary Proposal, \$1,524,692, 11/1/07-10/31/11. (Pending)
49. Vyavahare, N.R. (*Principal Investigator*), Webb, K. (*Project Principal Investigator*) Biomaterials for guided neural regeneration, NIH-COBRE, \$580,000, 9/05-9/08. (Declined)
50. Vyavahare, N.R. (*Principal Investigator*), Webb, K. (*Project Principal Investigator*) Biomaterials for guided neural regeneration, NIH COBRE, \$655,000, 9/07-9/10. (Pending Review)
51. Webb, K. (*Principal Investigator*) Scaffold-derived spatio-temporal signals for stem cell recruitment and differentiation, DARPA, \$1,425,000, 2005-2007. (Declined)
52. Webb, K. (*Principal Investigator*) Biomaterials for guided neural regeneration, NIH COBRE. \$400,000, 2006-2008. (Declined)
53. Webb, K. (*Principal Investigator*) Topographic fibers as templates for tissue regeneration, National Textile Council, \$300,000, 2005-2008.
54. Webb, K. (*Principal Investigator*) Molecular gradients for directing axonal regeneration, NIH R21 (NINDS), \$250,000, 2006-2007.
55. Webb, K. (*Principal Investigator*) Engineering regeneration through the distal bridge / host interface, Christopher Reeve Paralysis Foundation, \$148,324, 11/04-11/06. (Declined)
56. Webb, K. (*Principal Investigator*) Engineering regeneration through the bridge / host interface, Paralysis Project of America, \$50,000, 12/04-12/05. (Declined)
57. Webb, K. (*Principal Investigator*) Topographic fibers as templates for tissue organization, National Textile Council, \$300,000, 2004-2007. (Declined)
58. Webb, K. (*Principal Investigator*) Topographic fibers as templates for tissue organization, National Textile Council, \$423,000, 5/05-5/08. (Declined)
59. Webb, K. (*Principal Investigator*) Molecular gradients for directing axonal regeneration, NIH/NINDS, \$359,970, 4/06-4/08. (Declined)
60. Webb, K. (*Principal Investigator*) Channel grooved polymer fibers as tissue templates, National Textile Center, \$495,000, 5/06-5/09. (Declined)
61. Webb, K. (*Principal Investigator*) Capillary channel polymer fiber scaffolds for ligament tissue engineering, AO Foundation, \$97,000, 4/07-4/09. (Declined)

62. Webb, K. (*Principal Investigator*) Molecular gradients for directing axonal regeneration, NIH/NINDS, \$359,970, 11/07-11/09 (in preparation for submission)
63. Webb, K. (*Principal Investigator*) Synthesis and characterization of biodegradable elastic fibers, Clemson University Research Investment Fund Program, 1/2007. (Declined)
64. Webb, K. (*co-Principal Investigator*) Development of smart tissue adhesive for bladder injury, Coulter Foundation, 3/2007. (Declined)
65. Webb, K. (*Principal Investigator*) Biomaterial scaffolds integrating anti-scarring and growth-promoting mechanisms, National Institutes of Health, Director's New Innovator Award, 5/2007. (Declined)
66. Webb, K. (*Principal Investigator*) Biomaterials for Guided Neural Regeneration, National Institutes of Health COBRE, 10/2007. (Pending)
67. Webb, K. (*co-Principal Investigator*) Development of scar-inhibiting compliant tissue adhesive, NIH/NIBIB R21, 10/2007. (Pending)
68. Webb, K. (*Principal Investigator*) L1 gene therapy for axonal regeneration, Craig H. Neilsen Foundation, \$234, 421, 12/2007. (Declined, revised submission in preparation 12/2008).
69. Webb, K. (*Principal Investigator*) Bioactive fiber composites for axonal regeneration, NIH/NINDS R21, \$400,242, 6/2008. (Unscored, revised submission in preparation)
70. Webb, K. (*Principal Investigator*) Target-specific polymeric micelle/siRNA complex nanotherapeutics for CNS regeneration, NIH/NINDS R21, \$400,242, 6/2008. (Original score 270, first revision in preparation)
71. Webb, K. (*Principal Investigator*) Vibratory mechanotransduction, NIH/NIBIB R21, \$411, 663, 6/2008. (Original score 136 (5+ percentile), pending council review)
72. Webb, K. (*co-Principal Investigator*) Development of scar-inhibiting compliant tissue adhesive, NIH/NIBIB R21, \$392,775, 7/2008, (Original score 285, First revision: 178, 2nd revision in preparation)
73. Webb, K. (*co-Principal Investigator*) Drug-releasing hydrogel tissue adhesive, Department of Defense Congressionally Directed Medical Research Program (DOD-CDMRP), Deployment Related Medical Research Program, Hypothesis Development Award, \$219,821, 10/2008. (Pending)
74. Webb, K. (*co-Principal Investigator*) Multi-functional Nanotherapeutics for Axonal Plasticity and Regeneration, Department of Defense Congressionally Directed Medical Research Program (DOD-CDMRP), Deployment Related Medical Research Program, Hypothesis Development Award, \$220,367, 10/2008. (Pending)
75. Wilson, L.B. (*Principal Investigator*) Influence of Inflammation and Gender on Reflex Control of the Circulation, American Heart Association—Mid Atlantic, \$120,000.

76. Wilson, L.B. (*Principal Investigator*) Influence of Inflammation and Gender on Reflex Control of the Circulation, National Science Foundation, \$350,000.
77. Wise, H.H. (*Principal Investigator*) Thomas, K.J. (*co-Principal Investigator*) Effectiveness of Peer versus Professional Support in Home-based Physical Activity Programs, Center for Disease Control and Prevention, \$941,140. (Not funded)
78. Wise, H.H. (*Principal Investigator*) Thomas, K.J. (*co-Principal Investigator*) Peer versus Professional Support in Home-based Physical Activity, Paralyzed Veterans, \$150,000. (Not funded)

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1. Atkinson, C., Zhou, H., Qiao, F., Varela, J., Yu, J., Song, H., **Kindy, M. S.**, & **Tomlinson, S.** (2006). Complement dependent P-selectin expression and injury following ischemic stroke. *Journal of Immunology*, 177(10), 7266-7274.
2. Bakken, D., Burg, K., Narasimhan, S., & **Gao, B. Z.** (2005). Microspheres into neuronal-glia co-culture for the study of axonal regeneration. *Macromolecular Symposia* 227(335-344).
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4. **Barbosa, E.** (2005). Attenuation of acute inflammatory response by atorvastatin after spinal cord injury. *J. Neurosci Res*, 79, 340-350.
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8. **Brotherton, S. S.**, **Krause, J. S.**, & Nietert, P. J. (2006). Falls in individuals with incomplete spinal cord injury. *Spinal Cord*, 45, 37-40.
9. **Brotherton, S. S.**, **Krause, J. S.**, & Nietert, P. J. (2007). A pilot study of factors associated with falls in individuals with incomplete spinal cord injury. *Journal of Spinal Cord Medicine*, 30(3), 243-250.
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13. Das, A., Guyton, M. K., Matzelle, D. D., **Ray, S. K.** , & Banik, N. L. (2008). Time-dependent increases in protease activities for neuronal apoptosis in spinal cords of lewis rats during development of acute experimental autoimmune encephalomyelitis. *J. Neurosci. Res*, *86*, 2992-3001.
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27. **Krause, J. S.**, & Terza, J. (2006). Injury and demographic factors predictive of disparities in earnings after spinal cord injury. *Archives of Physical and Medical Rehabilitation*, *87*(10), 1318-1326.
28. **Krause, J. S.** (2003). Years to employment after spinal cord injury. *Archives of Physical Medicine & Rehabilitation*, *84*(9), 1282-1289.
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105. Xu, T., Zhang, N., Nichols, H. L., Shi, D., & **Wen, X.** (2007). Modification of Nanostructured Materials for Biomedical Applications. *Materials Science & Engineering C.*, 27, 579-594.
106. **Yao, H.**, & Gu, W. Y. (2007a). Convection and diffusion of solute in charged hydrated soft tissues: a mixture theory approach. *Biomechanics and Modeling in Mechanobiology*, 6, 63-72.
107. **Yao, H.**, & Gu, W. Y. (2007b). Three-dimensional inhomogeneous triphasic finite element analysis of physical signals and solute transport in human intervertebral disc under axial compression. *Journal of Biomechanics*, 40, 2071-2077.
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109. Yuen, H. K., Burik, J.K., **Krause, J. S.** (2004). Physical and psychological well-being among adults with spinal cord injury: the role of volunteer activities. *Topics in Spinal Cord Injury Rehabilitation*, 9(4), 19-25.
110. **Yuen, H. K.**, Wolf, B., Magruder, K., Bandyhoypadhyay, D., **Selassie, A.**, & Salinas, C. (2009). Factors limiting access to dental care for

adults with Traumatic Spinal Cord Injury. *Journal of American Dental Association, Forthcoming.*

111. Zhang, L., Yu, J., & **Kindy, M. S.** (2005). Does knockout of JNK3 gene provide a protective action in spinal cord injury of mice? *International J. Emergency Critical Care Med.*, 2, 497-503.
112. Zhang, N., Zhang, C., & **Wen, X.** (2005). Fabrication of semi-permeable hollow fiber membranes with highly aligned texture for nerve guidance. *Journal of Biomedical Materials Research: Part 1*, 75(4), 941-949.

Invited Talks and Presentations

1. Banik NL, Wei L, Samantaray S, Das A, Sribnick EA, Matzelle DD, **Ray SK**, Yu SP (2008) Neuroprotective efficacy of estrogen in acute and chronic spinal cord injury in rats (Poster Number: P2-03-07). Presented in the 3rd International Society for Neurochemistry (ISN) Special Neurochemistry Conference, June 27 - July 1, Beijing, China.
2. Banik NL, Wei L, Samantaray S, Das A, Sribnick EA, Matzelle DD, **Ray SK**, Yu SP (2008) Estrogen is neuroprotective in acute and chronic spinal cord injury (SCI) in rats. Presented in the 9th International Conference on Neuroprotective Agents, September 7-11, Marine Biological Laboratory (MBL), Woods Hole, MA, USA.
3. **Barbosa E.** Attenuation of Acute Inflammatory Response by Atorvastatin after Spinal Cord Injury. Presented at the annual meeting of the American Society of Neurochemistry, August 14, 2004.
4. **Barbosa E.** HMG-CoA Reductase Inhibitor protects against Endothelial Dysfunction and Inflammatory Disease in a Rat Model of Spinal Cord Injury. Presented at the annual meeting of the Society for Neuroscience, November 12, 2005.
5. Beachley, V., & **Wen, X.** Three Dimensional Aligned Individual Nano-fibers For Neural Tissue Engineering; Society for Biomaterials 33rd Annual Meeting, Chicago, IL, USA (2007)
6. **Brotherton SS**, Nietert PJ. Falls among individuals with incomplete spinal cord injury. Platform presentation at: South Carolina Spinal Cord Injury Research Fund Scientific Conference; Charleston, SC, May 2005.
7. **Brotherton SS, Krause JS**, Nietert PJ. Risk factors for falls among individuals with incomplete spinal cord injury. Presented at the APTA Combined Sections Meeting; San Diego, CA, February 2006.
8. **Brotherton SS, Krause JS**, Nietert PJ. Falls among individuals with incomplete spinal cord injury Presented at the APTA Combined Sections Meeting; San Diego, CA, February 2006.

9. **Brotherton SS**, Krause JS, Nietert PJ Falls in individuals with incomplete spinal cord injury. Poster accepted for presentation: APTA Scientific Meeting and Exposition; June 2007; Denver, CO.
10. Cribb RC, Lee JS, and **Webb K**. Cloning and expression of bioactive recombinant L1 neural cell adhesion molecule (Regenerate World Tissue Engineering Congress 2006).
11. Das A, Pava MJ, Reiter RJ, Woodward J, **Ray SK**, Banik NL (2008) Melatonin acts via receptor mediated pathway to attenuate apoptosis in VSC4.1 motoneurons exposed to H₂O₂, glutamate, and TNF- α . Presented in the Annual Meeting of the Society for Neuroscience (SfN), November 15-19, Washington, DC.
12. Datar K, Lee JS, Vyavahare NR, **Webb K**. Controlled release hydrogel coatings on deep groove polymer fibers for spinal cord regeneration. Society for Biomaterials; Memphis, TN, 2005.
13. Dean D, Vertegel A, Dooley RL, and **Gao BZ**. "Matrix Regulation of Cardiomyocyte Mechanical Properties Investigated by AFM," BMES 2006 Annual Meeting, October 11-14, 2006, Chicago.
14. Delphine D, Gourdie R, Borg T, Dooley L and **Gao BZ**, "AFM Investigation of Fibroblast-Fibroblast Interactions on Collagen Substrates," Society for Biomaterials Annual Meeting, Pittsburg, PA, April 26-29, 2006.
15. **Dismuke, C.E.** (presenter), Bradford, W.D., & **Krause, J.S.** Labor Market Participation of the Spinal Cord Injured: Effects of Disability Payments, Spousal Labor-Market Supply and Care-Giving Intensity. Presented at the 6th International Health Economics Association Meetings, Copenhagen, Denmark, June 2007.
16. **Dismuke, C.E.**, Bradford, W.D., & **Krause, J.S.** Income Below the Poverty Level: The Reality of SCI Households. Poster Presented at the 2nd Annual Spinal Cord Injury Fund Association Conference, Charleston, SC. June 2008.
17. **Dismuke, C.E.** (presenter), **Krause, J.S.**, & Terza, J.P. Why Do So Many Families Affected By Spinal Cord Injury Live in Poverty? Presented at the 2nd Biennial Conference of the American Society of Health Economists, Duke University, Durham, NC, June 2008.
18. **Dismuke, C.E.**, Jones, W. (presenter), **Krause, J.S.** The Effect of Education Acquisition on Employment and Income of Individuals Affected by Spinal Cord Injury. Poster Presented at the American Public Health Association Meetings October 2008.
19. **Dismuke, C.E.** Economic Consequences of Spinal Cord Injury in OEF/OIF Veterans. Presented at the REAP VA Seminar Series, Ralph H. Johnson VA., December 2008.
20. Duncan B, River ED, Merlo A, **Fritz SL**. The Effect of Intensive Mobility Training Booster Session in an Individual with Chronic Spinal Cord Injury. University of South Carolina Graduate Student Day. April 2008. Platform Presentation.

21. **Fritz, SL.** Intensive Mobility Training, an Intervention Across Populations. The Healthy Aging Research Consortium, Talk-a-topic presenter. Columbia, SC. December 2005.
22. **Fritz, SL.** Intensive Mobility Training, an Intervention for Individuals with Neurologic Impairments and Disabilities, SCAPTA Midlands District Meeting. Columbia, SC. May 2007.
23. **Fritz, SL.** Constraint-Induced Movement Therapy and Locomotor Training, from theory to application. Physical Therapy Program. Hogeschool Utrecht College; Utrecht, Holland. October 2007.
24. **Fritz, SL.** Constraint-Induced Movement Therapy and Locomotor Training, from plasticity to function. Department of Neuroscience- Universiteit Utrecht; Utrecht, Holland. October 2007.
25. **Fritz, SL.** Intensive Training: Application to Speech Therapy. University of South Carolina, Neurogenics Graduate Program in Speech-Language Pathology. March 2008.
26. **Fritz, SL.** Intensive Mobility Training: a Hybrid of CIMT and LT. Chatham University, Pittsburg, PA. March 2008.
27. **Fritz SL,** Merlo AR, Rivers ED. Intensive Mobility Training for an Individual with Incomplete Spinal Cord Injury: A Case Study. Presented at the Second Scientific Conference of the South Carolina Spinal Cord Injury Research Fund, Charleston, SC. May, 2008. Poster Presentation.
28. **Fritz, SL.** Neuroplasticity. HealthSouth Rehabilitation Hospital: Rehabilitation Approaches for the 21st Century. May 2008.
29. **Fritz SL,** Merlo AR, Rivers ED, Watson E. Intensive Mobility Training as an Intervention for Individuals with Incomplete Spinal Cord Injury: A Pilot Study. Presented at Physical Therapy 2008: Annual Conference & Exposition of the American Physical Therapy Association, San Antonio, TX. June 2008. Platform Presentation.
30. **Fritz, SL.** Intensive Mobility Training: Pilot Results from Intensive Therapy. Dorn VA Medical Center, Grand Rounds. July 2008
31. **Fritz SL,** Merlo AR, Rivers ED, Brandenburg B, Sweet JK, Galloway D, deBode S. Intensive Mobility Training in Individuals with Chronic Neurological Injuries: A Case Series. To be presented at Combined Sections Meeting, Las Vegas, NV. February, 2009. Poster Presentation.
32. **Gao BZ.** Laser Cell Guidance of Embryonic Chick Forebrain Neuronal Cell for Study of Spinal Cord Microenvironments. Presented at the Fifth Frontiers in Neuroscience Research Day, Charleston, SC; March 19, 2004.
33. **Gao BZ.** Laser Micropatterning of Polylactide Microspheres into Neuronal-Glial Coculture to Quantitatively Study Axonal Regeneration. Presented at the 2004 Polymer Networks Conference; Bethesda, MD, August 15-19, 2004.

34. **Gao BZ.** Investigation of Axonal Regeneration Using Laser Cell Micropatterning. Presented at the Society for Biomaterials' Symposium on Biomaterials in Regenerative Medicine: The Advent of Combination Products; Philadelphia, PA, October 16 - 18, 2004.
35. **Gao BZ.** Laser Cell Micropatterning to Engineer Microenvironments for Cardiomyocyte-Fibroblast Interactions. Presented at the 2004 BMES Annual Fall Meeting; Philadelphia, PA, October 13-16, 2004.
36. **Gao BZ.** Electrical Coupling between Laser Patterned Fibroblasts and Myocytes. Presented at the 2nd International Workshop on Bioprinting, Biopatterning and Bioassembly; Charleston, SC, March 13-15, 2005.
37. **Gao BZ** Laser Cell Micropatterning System. Presented at the 2nd International Workshop on Bioprinting, Biopatterning and Bioassembly; Charleston, SC, March 13-15, 2005.
38. **Gao BZ.** Release of Nerve Growth Factor from Polylactide-co-glycolide Microspheres for use in Laser Micropatterning. Presented at the 6th Annual Frontiers in Neuroscience Research Day – Neuromics: From Genomics to Metabolomics; Charleston, SC, March 18, 2005.
39. **Gao BZ.** Analysis of Neurite Outgrowth for a Laser Patterned Neuronal Culture. Presented at the 2nd International IEEE EMBS Conference on Neural Engineering; Washington D.C., March 16-19 2005.
40. **Gao, BZ.** Mechanical Interactions between Myocytes and Fibroblasts at the Single Cell Level. Presented at the Society For Biomaterials 30th Annual Meeting; Memphis, TN, April 27-30 2005.
41. **Gao, BZ** Axon Guided by the Release of Neuron Growth Factor from Polylactide-co-glycolide Microspheres. Presented at the Society For Biomaterials 30th Annual Meeting; Memphis, TN, April 27-30 2005.
42. **Gao, BZ** Electrical Coupling of Myocyte and fibroblast on various ECMs. Presented at the Society For Biomaterials 30th Annual Meeting; Memphis, TN, April 27-30 2005.
43. **Gao, BZ** Multielectrode Arrays Surface Characterization and Modification for Neuronal Cell Adhesive and recording. Presented at the Society For Biomaterials 30th Annual Meeting; Memphis, TN, April 27-30, 2005.
44. **Gao, BZ** Motor Units Created on a Homogenous Coated Biosurface. Presented at the Society For Biomaterials 30th Annual Meeting; Memphis, TN, April 27-30, 2005.
45. **Gao BZ.** Cell Diagnosis Based on Optical Forces. Presented at the International Society for Optical Engineering Annual Meeting; San Diego, CA, July 31-August 4, 2005
46. **Gao BZ.** Mechanical Interactions between Myocytes and Fibroblasts at the Single Cell Level. To be presented at the Biomedical Engineering Society's 2005 Annual Meeting; Baltimore, MD, September 28 - October 1, 2005.

47. **Gao BZ.** Laser Cell Micropatterning for the Formation of Neuromuscular Junctions on an MEA. To be presented at the Biomedical Engineering Society's 2005 Annual Meeting; Baltimore, MD, September 28 - October 1, 2005.
48. **Gao BZ.** Effects of Nerve Growth Factor Release from a Single PLGA Microsphere on Individual Neurons. To be presented at the Biomedical Engineering Society's 2005 Annual Meeting; Baltimore, MD, September 28 - October 1, 2005.
49. **Gao BZ.** Automated Laser Patterning of Neurons into Isolated Microenvironments on an MEA. To be presented at the Biomedical Engineering Society's 2005 Annual Meeting; Baltimore, MD, September 28 - October 1, 2005.
50. **Gao BZ.** Fibroblast-Myocyte Electrical Coupling in a Micropatterned Cell Coculture. To be presented at the Biomedical Engineering Society's 2005 Annual Meeting; Baltimore, MD, September 28 - October 1, 2005.
51. **Gao BZ,** "Optical Techniques in Biomedical Research", lectured in School of Precision Instrument and Optoelectronics Engineering, Tianjin University, PR China, Nov. 25, 2005
52. **Gao BZ,** "Laser Micropatterning Technique", lectured in Institute of Materials Processing & Automation, Tsinghua University, PR China, Nov. 29, 2005
53. **Gao BZ,** "NGF Stimulated Neurite Outgrowth in a Laser Patterned Neuronal Network," 7th Annual Frontiers in Neuroscience Research Day Conference, Charleston, SC, March 17, 2006
54. **Gao BZ,** "AFM Characterization of Coupled Cardiac Cell Coculture" 2nd South Carolina Bioengineering Symposium, Clemson, SC, June 19-20, 2006
55. **Gao BZ,** "Laser Cell Micropatterning Technique", lectured in School of Electrical and Electronic Engineering, Yanyong Technological University, Singapore, Dec. 1, 2006
56. **Gao BZ,** "Biophotonics", lectured in Institute of Optoelectronics, Shenzhen University, , PR China, Dec. 8, 2006
57. George J, Norris JS, Banik NL, **Ray SK** (2008) Simultaneous siRNA mediated downregulation of hTERT and treatment with interferon-gamma in human glioblastoma SNB-19 and LN-18 cells causes cell cycle arrest and inhibits invasion, angiogenesis, and tumor growth in nude mice In: Proceedings of the 99th Annual Meeting of the American Association for Cancer Research; 2008 Apr 12-16; San Diego, CA. Philadelphia (PA): AACR; 2008. Abstract number 1834.
58. George J, Tomlinson S, Banik NL, **Ray SK** (2008) Synergistic effect of Bcl-xL small interfering RNA and genistein in human neuroblastoma SH-SY5Y and SK-N-DZ cells for induction of apoptosis and inhibition of angiogenesis and tumor growth in nude mice. In: Proceedings of the 99th Annual Meeting of the American Association for Cancer Research; 2008 Apr 12-16; San Diego, CA. Philadelphia (PA): AACR; 2008. Abstract number 4406.

59. George J, Banik NL, **Ray SK** (2008) siRNA mediated knockdown of Bcl-2 and low-dose taxol treatment in human glioblastoma U251MG cells induces apoptosis, inhibits cell invasion, angiogenesis, and tumor growth in nude mice. In: Proceedings of the 99th Annual Meeting of the American Association for Cancer Research; 2008 Apr 12-16; San Diego, CA. Philadelphia (PA): AACR; 2008. Abstract number 4389.
60. Gohad, N., Shah, N.M., Metters, A.T., & Mount, A. Bioactive Polymer Surfaces as a Novel Fouling Deterrence Strategy. Material Research Society, accepted 2009 Spring Meeting.
61. Guyton MK, Das A, Pahan K, **Ray SK**, and Banik NL (2008) Calpain inhibition attenuates immunological and neurodegenerative pathologies of EAE. Presented in the 39th annual meeting of the American Society for Neurochemistry (ASN), March 1-5, San Antonio, TX.
62. Harris, B.P., & **Metters, A.T.** Controlled surface modification via living radical photografting. Abstracts of Papers of the American Chemical Society 230: U4241, August 2005.
63. Harris, B.P., & **Metters, A.T.** Controlled surface modification using functional monomers to create bioactive surfaces exhibiting precisely controlled gradients in ligand density. Abstracts of Papers of the American Chemical Society 230: U4304, August 2005.
64. Harris, B.P., & **Metters, A.T.** Polymer brush gradients promoting cell adhesion and motility across biomaterials substrates. 231:505, March 2006.
65. Harrison-Felix C, Brown A, **Pickelsimer EE**, DeVivo M, Whiteneck G, Hammond FM. Rehabilitation Practice Implications of Research on Life Expectancy After Spinal Cord Injury and Traumatic Brain Injury. 2-hour course presented at the American Congress of Rehabilitation Medicine Annual Conference, Boston, September 28-30, 2006.
66. Jaishankar K, Vyavahare NR, and **Webb K.** Simulation of vocal fold stress-strain in a bioreactor with cell encapsulated 3D hydrogel scaffolds. Regenerate World Congress on Tissue Engineering and Regenerative Medicine, Pittsburgh, PA (2006).
67. Janardhanan R, Butler JT, Banik NL, **Ray SK** (2008) N-(4-Hydroxyphenyl) retinamide induced differentiation with down regulation of telomerase and potentiated paclitaxel actions for cell cycle arrest and apoptosis in rat glioblastoma C6 and RG2 cells. Presented in the Annual Meeting of the Society for Neuroscience (SfN), November 15-19, Washington, DC.
68. Karmakar S, Banik NL, **Ray SK** (2008) Development of guide-cannula intracranial allograft model of glioblastoma in Sprague-Dawley rats. Presented in the 39th annual meeting of the American Society for Neurochemistry (ASN), March 1-5, San Antonio, TX.

69. Karmakar S, Banik NL, **Ray SK** (2008) Combination of N-(4-hydroxyphenyl) retinamide and genistein induced differentiation and multiple molecular mechanisms for apoptosis in human malignant neuroblastoma SK-N-MC xenografts in nude mice. In: Proceedings of the 99th Annual Meeting of the American Association for Cancer Research; 2008 Apr 12-16; San Diego, CA.
70. Karmakar S, Walle T, Banik NL, **Ray SK** (2008) Treatment with combination of all-trans retinoic acid and interferon-gamma regressed human glioblastoma T98G xenografts in nude mice. In: Proceedings of the 99th Annual Meeting of the American Association for Cancer Research; 2008 Apr 12-16; San Diego, CA.
71. Kasyanov V, Hajdu Z, Moreno R, Stradins P, Ozolanta I, **Yao H**, Markwald RR, and Mironov V, "Biomechanical properties of postnatal porcine heart valves," *The 3rd Biennial Meeting on Valve Biology and Tissue Engineering of the Society for Heart Valve Disease*, London, UK, May 4-7, 2008
72. Khan, M., Hoda, M.N., Giri, S., Gilg, A.G., Singh, I., Singh, A.K. (2008). Protection of endothelial function by S-nitrosoglutathione following acute injury in a rat model of experimental stroke. Presented at the 26th Annual National Neurotrauma Symposium, Orlando, FL: July 27-30, 2008.
73. **Kindy, MS**. Society for Neuroscience, Atlanta, GA, October 14-18, 2006, "AGE Receptor Mechanisms and therapeutics in Alzheimer's disease".
74. **Kindy, MS**. Queensland Brain Institute, August 6, 2006, University of Queensland, Brisbane, Australia, "Mechanisms and therapeutics in Alzheimer's disease".
75. **Kindy, MS**. International Conference on Alzheimer's Disease, July 15-20, 2006, Madrid, Spain, "Mechanisms and therapeutics in Alzheimer's disease"
76. **Kindy, MS**. Foundation for Research Development, April 20, 2006, "Biotechnology in South Carolina".
77. **Kindy, MS**. SCBIO, March 27, 2006, "Starting a Biotechnology Company in South Carolina".
78. **Kindy, MS**. Department of Commerce, March 23, 2006, "Biotechnology in South Carolina"
79. **Kindy, MS**. Charleston Small Business Consortium, March 15, 2006, "Biotechnology in South Carolina".
80. **Kindy, MS**. Medical University of South Carolina, Interview for Associate Provost for Research, January 30, 2006, "A tale of two receptors: Mechanisms and therapeutics in Alzheimer's disease".
81. **Kindy MS**. Department of Bioengineering, USC, December 6, 2005, "AGE receptors in Alzheimer's Disease".
82. **Kindy, MS**. Department of Veterans Affairs, December 13, 2005, "A tale of two receptors: Mechanisms and therapeutics in Alzheimer's disease".

83. **Kindy, MS.** Cell signaling in stroke, Shandong University, Jinan, China, July 11, 2005.
84. **Kindy, MS.** Therapies in Alzheimer's disease, Jinan Central Hospital, Jinan, China, July 9, 2005.
85. **Kindy, MS.** Stroke: Mechanisms of disease, Great Wall Hospital, Jinan, China, July 8, 2005.
86. **Kindy, MS.** Systemic interactions in Alzheimer's disease, Laling Hospital, July 10, 2005.
87. **Kindy, MS.** Systemic interactions in Alzheimer's Disease, University of Central Florida, Orlando, FL, May 16, 2005
88. **Kindy, MS.** Society for Neuroscience Meeting, San Diego, CA October 23-27, 2004, RAGE and Abeta amyloid deposition in Alzheimer's disease.
89. **Kindy, MS.** II International Congress on Neuroregeneration, Rio De Janeiro, Brazil, September 20-24, 2004, Invited Speaker and Chair, Session on "The State of Clinical Trials for Neuronal Repair"
90. **Kindy, MS.** Xth International Symposium on Amyloidosis, Tours, France, April 18-22, 2004, Organizer/Invited Speaker.
91. **Kindy, MS.** 2nd International Beijing Stroke Forum, Beijing, China, June 13-15, 2003 Cell Signaling in Stroke.
92. **Kindy, MS.** Clemson University, Department of Bioengineering, March 7, 2003.
93. **Kindy, MS.** Stroke and Neuronal Degeneration, Apoptosis 2003, Luxembourg, Jan. 28-Feb. 1, 2003.
94. **Kindy, MS.** Abeta degradation in AD, American Society for Neurochemistry Meeting, Palm Beach, FL, June 22-26, 2002
95. Kothapalli, C., & **Wen, X.** A Tissue Engineering Approach for Glial Scar Suppression in a Rat Brain Injury Model. 8th World Biomaterials Congress, Amsterdam, The Netherlands, (2008)
96. **Krause JS.** Vocational interests of persons with recent spinal cord injuries. (co-presenter: Broderick, L.E.) Presented at the annual conference of the American Association of Spinal Cord Injury Psychologists and Social Workers; Las Vegas, NV, September 2003.
97. **Krause JS.** Pressure ulcer history and spinal cord injury. Presented at the annual conference of the American Congress of Rehabilitation Medicine; Tucson, Arizona, October 2003.
98. **Krause JS.** The use of longitudinal design in spinal cord injury research. Pre-conference course to be presented at the annual conference of the American Spinal Injury Association; Denver, CO, May 2004.
99. **Krause JS.** Risk Factors for Mortality After SCI. (co-presenters: DeVivo, M.J, Jackson, A.) Presented at the annual conference of the American Spinal Injury Association; Denver, CO, May 2004.

100. **Krause JS.** Patterns of alcohol and substance use/abuse with SCI: Risk factors and correlates. (presented by: Tate, D. G.; co-presenters: Forchheimer, M., Meade, M. & Bombardier, C.) Presented at the annual conference of the American Spinal Injury Association; Denver, CO, May 2004.
101. **Krause JS.** The frequency, phenomenology and correlates of probable major depression one year after spinal cord injury. (presented by: Bombardier, C. H.; co-presenters: Richard, J. S., S., Tulsky, D., Tate, D. G.) Presented at the annual conference of the American Spinal Injury Association; Denver, CO, May 2004.
102. **Krause JS.** Maintenance of healthy affect and avoidance of depression after spinal cord injury. (presented by: Coker, J.; co-presenter: Broderick, L.) Presented at the annual conference of the American Association of Spinal Cord Injury Psychologists and Social Workers; Las Vegas, NV, September 2004.
103. **Krause JS.** Preinjury Alcohol Use, Intoxication at Injury, and Personality Among Persons With SCI. (presented by: Coker, J.; co-presenter: Broderick, L.) Presented at the annual conference of the American Association of Spinal Cord Injury Psychologists and Social Workers; Las Vegas, NV, September 2004.
104. **Krause JS.** Spiritual Coping: Differences between Caucasians and African Americans with spinal cord injuries. (presented by: Coker, J.; co-presenter: Broderick, L.) Presented at the annual conference of the American Association of Spinal Cord Injury Psychologists and Social Workers; Las Vegas, NV, September 2004.
105. **Krause JS.** Factors associated with earnings from gainful employment after spinal cord injury. (presented by: Coker, J.; co-presenter: Broderick, L.) Presented at the annual conference of the American Association of Spinal Cord Injury Psychologists and Social Workers; Las Vegas, NV, September 2004.
106. **Krause JS.** Risk factors for mortality after spinal cord injury. (Presented by: Pickelsimer, E.; co-presenters: DeVivo, M., Jackson, A., Broderick, L.) Presented at the annual conference of the American Congress of Rehabilitation Medicine; Ponte Vedre Beach, FL, September 2004.
107. **Krause JS.** Health Status, community integration and economic risk factors for mortality after spinal cord injury. (presented by: DeVivo, M. J.; co-presenter: Jackson, A.) Presented at the annual conference of the International Spinal Cord Society; Athens, Greece, September 2004.
108. **Krause JS.** Spiritual coping: Differences between Caucasians and African Americans with SCI. (Presented by: Broderick, L.) Presented at the annual conference of the American Public Health Association; Washington, DC, November 2004.
109. **Krause JS.** Maintenance of healthy affect and avoidance of depression after spinal cord injury. (Presented by: Broderick, L; co-presenters: Kemp, B, Coker, J). Presented at the annual conference of the American Public Health Association; Washington, DC, November 2004.

110. **Krause JS.** Spiritual coping: Differences between Caucasians and African Americans with SCI. (Presented by: Broderick, L). Presented at the annual conference of the American Spinal Injury Association; Dallas, TX, May 2005.
111. **Krause JS.** Vocational Interests among participants with spinal cord injury. (co-presenter Broderick, L.) To be presented at the annual conference of the American Psychological Association; Washington, DC, August 2005.
112. **Krause JS.** A 30-year longitudinal study of outcomes after spinal cord injury. To be presented at the annual conference of the American Congress of Rehabilitation Medicine; Chicago, IL, September 28-October 1, 2005.
113. **Krause JS.** Depressive symptoms during inpatient rehabilitation for spinal cord injury. To be presented at the annual conference of the American Congress of Rehabilitation Medicine; Chicago, IL, September 28-October 1, 2005.
114. **Krause JS.** A 30-year longitudinal study of outcomes after spinal cord injury. (co-presenter, Broderick, L.) To be presented at the annual conference of the American Public Health Association; New Orleans, LA, November 5-9, 2005.
115. **Krause JS.** Depressive symptoms during inpatient rehabilitation for spinal cord injury. (co-presenter, Broderick, L.) To be presented at the annual conference of the American Public Health Association; New Orleans, LA, November 5-9, 2005.
116. **Krause, JS.** An EMG-driven model to investigate cocontraction of lower extremity muscles during gait. (co-presentors: Karakostas, T., Berme, N., Hsiang, S.M.) Presented at the 5th World Congress of Biomechanics, Munich, Germany: 2006.
117. **Krause, JS.** Pain Interference and Ambulatory Spinal Cord Injury. (co-presentors: Broderick, L., Brotherton, S., Morrisette, D., Karakostas, T.) Presented at the annual conference of the International Spinal Cord Society and American Spinal Injury Association, Boston, MA: July, 2006.
118. **Krause, JS.** Earnings from gainful employment after spinal cord injury: Disparities attributable to sex, race, age, injury severity, and education. ((co-presentors: Broderick, L., Terza, J.) Presented at the annual conference of the International Spinal Cord Society and American Spinal Injury Association, Boston, MA: July, 2006.
119. **Krause, JS.** Pain Interference, Depression, and Ambulatory Spinal Cord Injury. (co-presentors: Newman, S., Brotherton, S., Morrisette, D., Karakostas, T.) Presented at the annual conference of the American Association of Spinal Cord Injury Psychologists and Social Workers, Las Vegas, NV: September 2006.
120. **Krause, JS.** Health, Participation, and Subjective Well-being after SCI: Relationship as a Function of Ambulatory and Mobility Status. (co-presentors: Brotherton, S.) Presented at the annual conference of the American Spinal Injury Association, Tampa, FL: June 2007.
121. **Krause, JS.** Earnings From Gainful Employment After Spinal Cord Injury: Disparities Attributable To Biographic, Injury, Educational, And Work Factors.

(co-presentors: Terza, J, Dismuke, C.) Presented at the annual conference of the American Spinal Injury Association, Tampa, FL: June 2007.

122. **Krause, J.S.** Health, participation, and subjective well-being after spinal cord injury: Relationship as a function of ambulatory and mobility status. Accepted but not presented at the 5th annual Aging Research Day, Clemson, SC: March 2008.
123. **Krause, J.S.** Depressive symptoms during inpatient rehabilitation for spinal cord injury. Presented at the annual conference of the American Board of Rehabilitation Psychologist, APA Div 22, Tucson, AZ: April 2008.
124. **Krause, J.S.** Relationship of provision of job accommodations with job retention after spinal cord injury. Presented at the annual conference of the American Spinal Injury Association, San Diego, CA: June 2008.
125. **Krause, J.S.** A prospective study of health and risk of mortality after spinal cord injury. Presented at the annual conference of the American Spinal Injury Association, San Diego, CA: June 2008.
126. **Krause, J.S.** A latent variable structural path model of health behaviors after spinal cord injury. Presented at the annual conference of the American Spinal Injury Association, San Diego, CA: June 2008.
127. **Krause, J.S.** The natural history of major depression after spinal cord injury. Presented at the annual conference of the American Spinal Injury Association, San Diego, CA: June 2008.
128. **Krause, J.S.** Examination of clinical utility indices of PHQ-9 items for two scoring schemes in men and women with spinal cord injury. Presented at the annual conference of the American Spinal Injury Association, San Diego, CA: June 2008.
129. **Krause, J.S.** Applying scientific data in the life care plan: Examples with spinal cord injury. Invited talk at the annual conference of the International Symposium on Life Care Planning, Scottsdale, AZ: September, 2008.
130. **Krause, J.S.** A latent variable structural path model of health behaviors after spinal cord injury. Poster presented at the annual conference of the American Congress of Rehabilitation Medicine, Toronto, Ontario: October, 2008.
131. **Krause, J.S.** Behavioral risk factors for mortality after spinal cord injury. Poster presented at the annual conference of the American Congress of Rehabilitation Medicine, Toronto, Ontario: October, 2008.
132. **Krause, J.S.** Changes in somatic and non-somatic depressive symptoms between inpatient rehabilitation and follow-up. Poster presented at the annual conference of the American Congress of Rehabilitation Medicine, Toronto, Ontario: October 2008.
133. **Krause, J.S.** Activity-based therapy in spinal cord injury: What are the known and presumed effects on neurological recovery, health, fitness, and quality of life? (co-presentors: Jones, M., Edgerton, R., Nash, M., Backus, D.) Symposium

presented at the American Congress of Rehabilitation Medicine, Toronto, Ontario: October 2008.

134. **Krause, J.S.** A latent variable structural path model of health behaviors after spinal cord injury. Presented at the annual conference of the American Public Health Association, San Diego, CA: October, 2008.
135. **Krause, J.S.** Changes in somatic and non-somatic depressive symptoms between inpatient rehabilitation and follow-up. Presented at the annual conference of the American Public Health Association, San Diego, CA: October, 2008.
136. **Krause, J.S.** Change in labor force participation after neurologic injury. Presented at the annual conference of the International Association of Rehabilitation Professionals Forensic Conference, Ft. Lauderdale, FL: November, 2008.
137. **Krause, J.S.**, McArdle, J.J., & Reed, K.S. Changes in somatic and non-somatic depressive symptoms between inpatient rehabilitation and follow-up. To be presented at the annual conference of the American Board of Rehabilitation Psychology, Division of Health Psychology (APA Div 38), Jacksonville, FL: February, 2009.
138. **Krause, J. S.**, Carter, R. E., Zhai, Y., & Saunders, L. L. A comprehensive predictive model of mortality after spinal cord injury. Submitted to the Congress on Spinal Cord Medicine and Rehabilitation, the combined annual conferences of the American Spinal Injury Association and the United Spinal Association, Dallas, TX: September, 2009.
139. **Krause, J.S.**, Saunders, L.L., & **Dismuke, C.E.** Delayed entry into employment after spinal cord injury: Factors related to time to work. Submitted to the Congress on Spinal Cord Medicine and Rehabilitation, the combined annual conferences of the American Spinal Injury Association and the United Spinal Association, Dallas, TX: September, 2009.
140. **Krause, J.S.**, Saunders, L.L., Reed, K.S., Coker, J.L., & Zhai, Y. Self-report measurement of depressive disorders after spinal cord injury: Comparison of the Patient Health Questionnaire and the Older Adult Health and Mood Questionnaire. Submitted to the Congress on Spinal Cord Medicine and Rehabilitation, the combined annual conferences of the American Spinal Injury Association and the United Spinal Association, Dallas, TX: September, 2009.
141. **Krause, J.S.**, Apple, D., & Saunders, L.L. Changes in somatic and non-somatic depressive symptoms between inpatient rehabilitation and follow-up. To be presented at the annual conference of the National Association of Rehabilitation Research Training Centers, Arlington, VA: May, 2009.
142. Kutty JK, Reifsnider C, Lu Q, Vyavahare NR, **Webb K.** Synthesis and characterization of composite hydrogels for vocal fold applications. Society for Biomaterials; Memphis, TN, 2005.

143. Kuo J, Wu YR, Yun J, and **Yao H**. Viscoelastic compressive properties of porcine TMJ disc and condyle Cartilage. The 37th Annual Meeting of the American Association for Dental Research, Dallas, TX, April 2-5, 2008.
144. Kuo J, Bacro T, and **Yao H**. Biphasic Viscoelastic properties of human TMJ disc. The 37th Annual Meeting of the American Association for Dental Research, Dallas, TX, April 2-5, 2008.
145. Kuo J, Yun J, and **Yao H**. Biomechanical characterization of TMJ disc and condyle cartilage. NIH/NCRR 2nd Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington, DC, August 6-8, 2008.
146. Li, X., Brunson, C., Zhang, N., **Wen, X**. The role of substrate stiffness on oligodendrocyte precursor cell growth in vitro. Society for Biomaterials Annual Meeting (2009)
147. Lineberry L, Selassie AW, **Pickelsimer EE**, Nicholas JS. Population-based outcome of traumatic spinal cord injury in South Carolina. NCIPC Injury Conference, Denver, May 9-11, 2005.
148. Liu H, Yun J, Pirlo R, Dean D, **Yao H**, and Gao BZ. The dependence of mechanical properties of adult rat myocytes on cell alignment. Proceedings of the ASME 2008 Summer Bioengineering Conference, Macro Island, FL, June 25-29, 2008.
149. Long, Y., Zhang, C., Zhang, N., Huang, Y., & **Wen, X**. Formation of highly aligned grooves on the inner surface of semi-permeable hollow fiber membrane for the directional axonal outgrowth. 2005 ASME International Mechanical Engineering Congress, Orlando, Florida USA, 2005
150. Mcrae JA, Borg T, Goodwin RL, Liu J, Knapp DR and **Gao BZ**. "Mechanical Force Analysis in the Progression of Hypertrophy in a Simulated Infarct Environment," BMES 2006 Annual Meeting, October 11-14, 2006, Chicago.
151. **McGinty JF**. Gene Expression Profiling of CNS Regions Implicated in a Mouse Model of Spinal Cord Injury-Induced Pain. Presented at the South Carolina Spinal Cord Injury Research Fund Scientific Conference, Medical University of South Carolina; Charleston SC, May 13th, 2005,
152. **Middaugh SJ**. Thomas KJ, Klingmueller J, Smith AR, McFall TL, Gilbert SP, and Bailey JA. Assessment and treatment of musculoskeletal pain in the neck and shoulder in manual wheelchair users with spinal cord injury. First Annual South Carolina Spinal Cord Injury Research Conference; Charleston, SC, May, 2005 (Platform Presentation).
153. **Middaugh SJ, Thomas KJ**, Klingmueller J, Smith AR, McFall TL, Gilbert SP, and Bailey JA. Treatment of musculoskeletal pain in the neck and shoulder in manual wheelchair users with spinal cord injury. Association for Applied Psychophysiology and Biofeedback 35th Annual Meeting; Colorado Springs, Colorado, 2004 (Poster presentation). Prevalence of Upper Quarter Pain in Individuals with Chronic SCI. Presented at the annual meeting of the South Carolina Spinal Cord Injury Research Fund; Charleston, SC., May 13, 2005.

154. Mitchell PO, Gourdie R, Borg TK, and **Gao BZ**. "Cardiac Fibroblast Bridges Conduct Electrical Signals between Myocyte Islands," American Heart Association Scientific Sessions 2006, November 12-15, Chicago
155. Olbrich JM, Satishkumar R, Reukov V, Thompson G, **Vertegel A**. Study of Protein Attachment to Poly-Butyl-Cyanoacrylate Nanoparticles, *Society for Biomaterials 2007 Annual Meeting*, April 18 - 21, **2007**, Chicago, Illinois.
156. **Pickelsimer EE**, Gabella BA, Wilson DA, **Selassie AW**, DeVivo MJ. Determination of occurrence and causes of death within five years of injury among South Carolina and Colorado residents with traumatic spinal cord injury. American Congress of Rehabilitation Medicine Annual Conference; Chicago, September 28-October 3, 2005.
157. **Pickelsimer EE**. Occurrence and causes of death of persons with traumatic spinal cord injury. South Carolina Spinal Cord Injury Annual Conference; Columbia, SC, May 12, 2005.
158. **Pickelsimer EE**, Wilson DA. Occurrence and causes of death of persons with traumatic spinal cord injury. South Carolina Spinal Cord Injury Research Fund Scientific Meeting; Charleston, SC, May 13, 2005.
159. **Pickelsimer EE**, Gabella BA, Wilson DA, **Selassie AW**, DeVivo MJ. Death within seven years of traumatic spinal cord injury. American Congress of Rehabilitation Medicine Annual Conference, Chicago, September 28-October 3, 2005.
160. **Pickelsimer EE**, Gabella BA, Wilson DA, **Selassie AW**, DeVivo MJ. Occurrence, causes of death, and probability of dying within five years of injury among South Carolina residents with traumatic spinal cord injury. 8th World Conference on Injury Prevention and Safety Promotion; Durban, South Africa, April 2-5, 2006.
161. **Pickelsimer, EE**. Disparity of patterns in health insurance status of persons with traumatic spinal cord injury. South Carolinal Spinal Cord Injury Research Fund Conference; May 30, 2008.
162. **Pickelsimer, EE, Wilson, D**. Disparity of patterns in health insurance status of persons with traumatic spinal cord injury. American Academy of Rehabilitation Annual Conference. Toronto, Canada; October 18, 2008.
163. **Pickelsimer, EE**. Prevalence and incidence of medically attended health conditions after traumatic spinal cord injury. MUSC Student Research Day; November 7, 2008.
164. Pirlo RK, Ma W, **Kindy M**, and **B.Z. Gao**, "Laser Patterning of Neurons and Myoblasts on MEAs: A Prospective Tool for Practical and Efficient Biosensor Fabrication," SPIE Defense and Security Symposium, Orlando (Kissimmee), FL; 17 - 21 April 2006
165. Pirlo RK, Ma W, **Kindy MS**, and **Gao BZ**, "Laser Patterning of a Defined Biological Neuronal Circuit on a Microelectrode Array," BMES 2006 Annual Meeting, October 11-14, 2006, Chicago

166. Qiu, Y., **Wen X.** Developing Highly Elastic Scaffolds from Natural Polymers: Chitosan and Gelatin; 8th World Biomaterials Congress, Amsterdam, The Netherlands, (2008)
167. **Ray SK.** Experimental Therapeutics for Activation of Apoptosis in Glioblastoma, MCBP External Seminar Series, Medical University of South Carolina; Charleston, SC, October 23, 2003.
168. **Ray SK.** Glioblastoma – an update from the AACR 2004 meeting', Neurology, Medical University of South Carolina; Charleston, SC, May 12, 2004.
169. **Ray SK.** Dexamethasone damages chemotherapeutic action of temozolomide in glioblastoma', Department of Neurosciences, Medical University of South Carolina; Charleston, SC, February 8, 2005.
170. **Ray, SK.** Therapeutic Effects of Estrogen in Spinal Cord Injury', SC Spinal Cord Injury Research Foundation (SCIRF) Conference; May 13, 2005.
171. **Ray, S.K.** Combination therapy for controlling the growth of human glioblastoma in cultures and xenografts, Department of Neurosciences, Medical University of South Carolina, Charleston, SC; February 14, 2006.
172. **Ray, S.K.** Brain tumors of astroglial origin: Glioblastoma immunology and immunotherapy, M&I Graduate Program, Medical University of South Carolina, Charleston, SC; September 28, 2006.
173. **Ray, S.K.** Regression of human glioblastoma T98G xenografts by all-trans retinoic acid and taxol, The 26th Annual Convention of the Indian Association for Cancer Research (IACR) and International Symposium on Translational Research in Cancer, Bhubaneswar, Orissa, India; January 19, 2007.
174. Reukov V, Olbrich JM, Satishkumar R, **Vertegel A.**, A Protein-Nanoparticle Conjugates as a Potential Therapeutic Agents For Treatment of Secondary Spinal Cord Injury, *Materials Research Society 2007 Fall Meeting*, November 26-30, **2007**, Boston, Massachusetts (*nominated*).
175. Reukov V, Maximov V, **Vertegel A.** Protein-Nanoparticle Conjugates As Neuroprotective Agents.; *Materials Research Society 2008 Fall Meeting*, December 1-5, **2008**, Boston, Massachusetts; (oral talk).
176. Reukov V, Satishkumar R, **Vertegel A.** Nanodevices For Treatment of Secondary Spinal Cord Injury, *Society for Biomaterials 2008 Annual Meeting*, September 11 – 13, **2008**, Atlanta, Georgia (oral talk).
177. Roman JM, Pirlo RK, Dean MD, Burg KJL, and **Gao BZ.** "Cell Diagnosis Based on Laser Guidance," Optics in the Southeast, September 6–8, 2006, Charlotte.
178. Roman JM, Pirlo RK, Burg K, and **Gao BZ.** "Development of a Portable Laser Guidance Microscope," BMES 2006 Annual Meeting, October 11-14, 2006, Chicago
179. Rosenbalm T, Owens S, Bakken D, and **Gao BZ,** "Investigation of cell viability after laser guidance," Biomedical Optics 2006 - part of SPIE's Photonics West symposium, San Jose, CA; 21-26 January 2006.

180. Rosenbalm T and **Gao BZ**. "A Systematic Evaluation of Laser Guidance Effects on Cell Viability," BMES 2006 Annual Meeting, October 11-14, 2006, Chicago.
181. Samantaray S, **Ray SK**, and Banik NL (2008) Spinal cord degeneration in MPTP-induced parkinsonism in C57BL/6N mice and Parkinson's disease patients. Presented in the 39th annual meeting of the American Society for Neurochemistry (ASN), March 1-5, San Antonio, TX.
182. Samantaray S, Das A, Matzelle D, Reiter RJ, **Ray SK**, and Banik NL (2008) Melatonin prevented neuronal death and axonal damage in spinal cord injury in rats. Presented in the 39th annual meeting of the American Society for Neurochemistry (ASN), March 1-5, San Antonio, TX.
183. Samantaray S, **Ray SK**, Banik NL (2008) Extranigral neurodegeneration in two different models of experimental Parkinson's disease: a role for calpain in neurodegeneration in the spinal cord. Presented in the GA/SC Neuroscience Consortium Meeting, March 29, Columbia, SC.
184. Samantaray S, **Ray SK**, Banik NL (2008) Production of MPP⁺ in the spinal cord caused spinal cord degeneration in C57BL/6N mice following MPTP-induced experimental parkinsonism. Presented in the South Carolina Aging Research Conference: Movement and Mobility, March 30 –April 1, Clemson, SC.
185. Samantaray S, Das A, Matzelle D, Reiter RJ, **Ray SK**, Banik NL (2008) Melatonin prevented inflammation, axonal damage, and neuronal death in spinal cord injury in rats. Presented in the 26th annual meeting of the National Neurotrauma Society (NNS), July 27 - 30, Orlando, FL.
186. Samantaray S, Branstiter W, Cobb D, **Ray SK**, Banik NL (2008) Bimodal toxic effects of glutamate on motoneurons and astrocytes in co-cultures: Neuroprotection with low doses of estrogen and calpeptin. Presented in the Annual Meeting of the Society for Neuroscience (SfN), November 15-19, Washington, DC.
187. Satishkumar R, Reukov V, **Vertegel A**. Treatment of Secondary Spinal Cord Injury using Covalently Conjugated Superoxide dismutase and Anti Glutamate Receptor on poly (butyl) Cyanoacrylate Nanoparticles, *Institute of Biological Engineering 2008 Annual Meeting*, March 6-9, **2008**, Chapel Hill, North Carolina (oral talk).
188. Shah, N.M., & Metters, A.T. Micropatterned interfacial polymer layers for directing cellular response. Society for Biomaterials, Chicago, April 2007.
189. Shah, N.M., Metters, A.T. & Webb, K. Protein Conjugated Patterned Polymer Surfaces for Neural Regeneration. Society for Biomaterials, submitted 2009.
190. Shi CC, Bowers C, Zhang L, and **Yao H**. Solute diffusion in TMJ disc measured using FRAP. *The 86th General Session of the International Association for Dental Research (IADR)*, Toronto, Canada, July 2-5, 2008.
191. Sinclair K, Brown PJ, and **Webb K**. Capillary channel polymer fibers as structural templates for ligament reconstruction. Presented at the Regenerate

- World Congress on Tissue Engineering and Regenerative Medicine, Pittsburgh, PA (2006).
192. Sinclair KD, Brown PJ, and **Webb K**. Novel fibers as structural templates for ligament regeneration. Presented at the annual conference of the Society for Biomaterials. Chicago, IL: April 2007.
 193. Smith AW, Guyton MK, Das A, **Ray SK**, and Banik NL (2008) Induction of calpain and caspase cascades in spinal cord tissues of Lewis rats with the onset of acute EAE. Presented in the 39th annual meeting of the American Society for Neurochemistry (ASN), March 1-5, San Antonio, TX.
 194. Sweeney A, Burg K, Kindy M, and Gao BZ, "Quantitative Effects of NGF Encapsulating PLGA Microsphere on Neurite Outgrowth at Single Cell Level," Society for Biomaterials Annual Meeting, Pittsburg, PA, April 26-29, 2006.
 195. **Vertegel A**, Reukov V, Thompson G, Satishkumar R, Yurko Y. Biomedical Nanodevices Based on Simultaneous Attachment of Several Functional Proteins to the Same Nanoparticle, *Materials Research Society 2007 Fall Meeting*, November 26-30, **2007**, Boston, Massachusetts.
 196. **Vertegel A**. Biomedical devices and biosensors based on protein attachment to nanoparticles, 35th Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Reno, NV, September 29 – October 2, **2008** (invited talk).
 197. Watson E, **Fritz SL**, Merlo AR, Rivers ED. Intensive Mobility Training: An intensive approach to chronic neurological rehabilitation. To be presented at Combined Sections Meeting, Las Vegas, NV. February, 2009. Poster Presentation.
 198. **Webb, K**. Deep groove fiber applications in axonal regeneration. 56th Southeastern Regional Meeting of the American Chemical Society; November 2004.
 199. **Webb, K**. Applications of capillary channel polymer fibers in regenerative medicine. Medical Textiles Conferences, March 21-22, 2006, Greenville, SC.
 200. **Wen, X**. Biomaterial-based bridges for CNS regeneration: past, current, and future; Society for Biomaterials 33rd Annual Meeting, Chicago, IL, USA (2007)
 201. Wilson DA, **Pickelsimer EE**, **Selassie AW**. Mortality within seven years after traumatic spinal cord injury. American College of Epidemiology; New Orleans, LA, Sept 17-20, 2005. (Note: This presentation has been cancelled due to Hurricane Katrina's destruction in New Orleans.)
 202. **Wilson LB**. Poster presentation at 2004 Experimental Biology Meeting in Washington, D.C.: Effect of gender on reflex cardiovascular responses to heat stimulation in decerebrate Guinea Pigs.
 203. **Wilson LB**. Role of spinal ionotropic excitatory amino acid receptors in the nociceptive pressor reflex evoked by noxious heat (poster presentation). International Congress of Physiological Sciences Meeting; San Diego, CA, 2005.

204. **Wilson LB.** Afferent neural pathways and central nervous system sites involved in the nociceptive pressor reflex (poster presentation). International Congress of Physiological Sciences Meeting; San Diego, CA, 2005.
205. Wise HH, Thomas JK, Sword DS, Diehl NS, Brown DD, Nietert P. Home physical activity programs for individuals with a spinal cord injury (poster presentation). CDC's 2006 Annual Health Promotion Conference: Innovations in Health Promotion: New Avenues for Collaboration, September 12-14, Atlanta, GA.
206. Wise HH, Thomas JK, Diehl N, Sword DO, Brown DD. Home programs of physical activity for the promotion of health and wellness in individuals with spinal cord injury (poster presentation). Annual Conference and Exposition of the American Physical Therapy Association, June 2007, Denver, Colorado.
207. Wu YR, Kuo J, Zhang L, and **Yao H.** Viscoelastic shear properties of porcine TMJ discs. *The 37th Annual Meeting of the American Association for Dental Research*, Dallas, TX, April 2-5, 2008.
208. Wu YR, Glaser JA, and **Yao H.** Effects of end-plate and mechanical loading on solute transport in intervertebral disc. *Proceedings of the ASME 2008 Summer Bioengineering Conference*, Macro Island, FL, June 25-29, 2008.
209. Yun J, Liu H, **Yao H**, LaBerge M, Borg T, Baicu C, Zile M, and Gao B. Application of laser guidance to irregularly shaped-cell patterning. *International Conference on Cellular & Molecular Bioengineering (ICCMB)*, Singapore, December 10-12, 2007.
210. Yun J, Zhang L, Dean D, LaBerge M, and **Yao H.** Mechanical properties of TMJ disc cells measured by atomic force microscopy. *Proceedings of the ASME 2008 Summer Bioengineering Conference*, Macro Island, FL, June 25-29, 2008.
211. Zhang, N., Tresco, P.A., & **Wen, X.** A Tissue Engineered Multifilament Entubulation Bridging Device for Spinal Cord Repair; Annual Meeting of the Biomedical Engineering Society, Chicago, IL, USA (2006)
212. Zhang, N., & **Wen, X.** Creating a glial scar-free implant-CNS interface by blocking chondroitin sulfate proteoglycan biosynthesis. World Congress on Tissue Engineering and Regenerative Medicine, Pittsburgh, PA, (2006)
213. Zhang R, Banik NL, and **Ray SK** (2008) Differential sensitivity of human glioblastoma LN18 (PTEN-positive) and A172 (PTEN-negative) cells to taxol for apoptosis. Presented in the 39th annual meeting of the American Society for Neurochemistry (ASN), March 1-5, San Antonio, TX.
214. Zhang R, Das A, **Ray SK**, Banik NL (2008) Estrogen partially inactivates PTEN to prevent apoptosis in VSC4.1 motoneurons following exposure to IFN- γ . Presented in the Annual Meeting of the Society for Neuroscience (SfN), November 15-19, Washington, DC.
215. Zhao, J., Zhang, N., & **Wen, X.** IL-10 Expressing Stem Cells Ameliorate CNS Inflammatory Response And Improve Survival And Migration; Annual Meeting of the Biomedical Engineering Society, Chicago, IL, USA (2006)