

**INDIANA SPINAL CORD AND BRAIN INJURY
RESEARCH FUND**

2008 ANNUAL REPORT

Submitted January 30, 2009

This report is in compliance with P.L. 234-2007 and contains information generated from 6 months of work on the part of 9 Board members and one staff member. This report is funded by the Indiana Spinal Cord and Brain Injury Research Fund.

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Annual Report for 2008

The Indiana Spinal Cord and Brain Injury Research Fund was created by the 2007 Indiana General Assembly under Indiana Code (IC) 16-41-42-4. Decisions for the fund are made by the Spinal Cord and Brain Injury Research Board who are appointed by the Governor, Indiana University, Purdue University, Brain Injury Association, National Spinal Cord Injury Association, and Rehabilitation Hospital of Indiana.

The Fund is to be used for the following purposes:

1. Establish and maintain a state medical surveillance registry for traumatic spinal cord and brain injuries.
2. Fulfilling the duties of the board.
3. Funding research related to treatment and cure of spinal cord and brain injuries, including acute management, medical complications, rehabilitative techniques, and neuronal recovery. Research must be conducted in compliance with all state and federal laws.

The Board is charged with the following duties:

- (1) Consider policy matters relating to spinal cord and brain injury research projects and programs,
- (2) Consider research applications and make grants for approved research projects,
- (3) Formulate policies and procedures concerning the operation of the board,
- (4) Review and authorize spinal cord and brain injury research projects and programs to be financed under this chapter,
- (5) Review and approve progress and final research reports on projects,
- (6) Review and make recommendations concerning the expenditure of money from the fund.

Executive Summary: Legislation went before and was passed by the 2008 General Assembly which changed the funding mechanism for the Indiana Spinal Cord and Brain Injury Research Fund (ISCBIRF). Effective December 31, 2008, the funding mechanism became a \$0.30 increase in registrations for non-commercial passenger vehicles, including cars, light trucks and motorcycles.

The Board for the ISCBIRF is required to meet a minimum of two times per year. In 2008, the Board formally met on five occasions to accomplish the goals of hosting the first Indiana Symposium related to spinal cord and brain injury research in Indiana and awarding the first research grants.

In the first quarter of 2008, the Board was dedicated to developing a Symposium which would draw researchers from around the state to identify current projects, promote collaboration, and announce the developing grant awards. The Symposium occurred on April 17, 2008 at the Indiana Historical Society. There were 86 attendees from 29 different organizations/institutions from throughout the state. Please see the attached list of topics.

The Board then began the task of creating the grant application, the application process, and the independent scientific review advisory panel for the grants. Because of the processes involved

and the scientific nature of the grants, it was determined that the Board did not have the expertise to coordinate these activities. The Indiana State Department of Health contracted with Lisa Dinsmore, Director of Operations, Office of Research Administration, Indiana University School of Medicine, to coordinate these steps. The grant review process was fully supported by the monies of the fund. The application was approved by the Board, the Request for Applications (RFA) was posted on June 17, 2008, and thirty-two applications were submitted by researchers from around the state.

Ms. Dinsmore created the Independent Scientific Advisory Panel, which was co-chaired by a representative from Purdue University, Indiana University and Rehabilitation Hospital of Indiana. These representatives were, respectively, Dr. John Turek, Dr. Gerry Oxford, and Dr. Jim Malec. Applications were triaged and reviewed by the individual reviewers, followed by an Advisory Panel Meeting for discussion and final scoring; National Institutes of Health (NIH) scoring was utilized. Scores and recommendations were presented to the Board for final selection.

The Board met on November 13, 2008 for final deliberations and award decisions after reviewing the scored applications. The decision was made to fund fourteen applications from six different institutions within the state. These applicants were fairly evenly split between spinal cord and brain injury projects and several were collaborative projects. This award cycle resulted in a distribution of almost \$1.7 million in funding to Indiana researchers and institutions; each grantee is receiving \$120,000 over two years. On December 10, 2008, the Indiana State Department of Health announced the first grant recipients as follows:

- Samantha L. Backhaus, Ph.D., Rehabilitation Hospital of Indiana Foundation; “Brain Injury Coping Skills group for Improving Self-Efficacy and Adjustment in Individuals with Brain Injury and Their Caregivers”
- Ji-Xin Cheng, Ph.D., Purdue University; “Effective Repair of Traumatically Injured Spinal Cord by Block Copolymer Micelles”
- Eri Hashino, Ph.D., Indiana University School of Medicine; “Novel Stem Cell Therapy for Spinal Cord Injury”
- Jacob T. Kean, Ph.D., Rehabilitation Hospital of Indiana Foundation; “An Exploration of the Hypocholinergic Hypothesis of Delirium Following Traumatic Brain Injury”
- Rajesh Khanna, Ph.D., Indiana University School of Medicine; “Investigating the molecular signaling of a novel interaction between CRMPs and VGCCs in facilitating axonal regeneration after nerve injury”
- Wei-Hua Lee, Ph.D., M.D., Indiana University School of Medicine; “IGF-I Therapy for Hypoxia-ischemia induced brain injury in newborns”
- Naikui Liu, Ph.D., Indiana University School of Medicine; “Role of cPLA α in the Pathogenesis of Spinal Cord Injury.”
- Brenna C. McDonald, Psy.D., Indiana University School of Medicine; “Neural basis of executive and memory changes after mild TBI in children and adolescents”
- Alyssa Panitch, Ph.D., Purdue University; “Inhibition of glial scarring for enhanced recovery following spinal cord injury.”

- Anne L Prieto, Ph.D., Indiana University – Bloomington; “role of the Tyro3 and Axl Receptor Tyrosine Kinases in Schwann Cell function”
- Jenna Rickus, Ph.D., Purdue University; “Bio-inorganic coating to reduce tissue reaction in cortical neural prostheses”
- Thomas M. Talavage, Ph.D., Purdue University; “Predictive modeling of cognitive impairment from head trauma in collegiate football players”
- Riyi Shi, M.D., Ph.D., Purdue University; “Rapid and sustained axonal reconnection for injured spinal cord”
- Xiaofei Wang, M.D., Ph.D., Indiana University School of Medicine. “functional regeneration following spinal cord injury: a combined strategy involving blockade of Wnt signaling, digestion of inhibitory CSPGs by grafts of Schwann cells overexpressing ChABC and targeted innervation by NT-3”

The Board evaluated the grant cycle, and it was determined that utilizing a different time frame for grant submissions and awards would allow applicants more conducive project timelines and be more consistent with other funding cycles. As 2008 came to a close, the grant application was being modified and improved. These changes will allow for improved focus of program objectives and provide clearer guidelines.

With knowledge and lessons learned from implementation of the first grant cycle, the Board now seeks to increase the awareness of the fund throughout the state. The goal is to increase both the number and quality of the applications from throughout the state.

The Board is preparing for 2009 and has developed next steps; please see ISCBIRF 2009 Plan below. The 2009 grant application has been posted; grant applications are due no later than March 16, 2009. It is anticipated the awards will be granted in June 2009. It is projected that approximately \$1.4 million will be available for the 2009 grants. The Board will begin its work planning the second spinal cord and traumatic brain injury research symposium; it is expected the symposium will become an annual event. Two of the Board members terms ended in November and are currently awaiting reappointment by the Governor.

Indiana Spinal Cord and Brain Injury Research Fund 2009 Plan

First Quarter

- Re-Elect Officers.
- Finalize new contractual agreements for Administrative Support and Scientific Reviewers.
- Finalize Application for Funding for next grant cycle.
- Post RFA for 2nd grant cycle.
- Investigate opportunities for developing 2nd Indiana Spinal Cord and Brain Injury Research Symposium. Symposium to be held in central location and bring together representatives from throughout the state to discuss current research activities, as well as future opportunities and priorities.

Second Quarter

- Independent Scientific Advisory Panel to score applications.
- Board to select projects that will be funded and disburse grants.
- Announce recipients of grants from the Indiana Spinal Cord and Brain Injury Research Fund.
- Work with ISDH on contractual agreements for next period.
- Assess opportunity for development of webpage within ISDH.

Third Quarter

- Analyze process of second grant cycle for improvements in 2010.

Fourth Quarter

- Initiate process for 2010 grant cycle and symposium.

Spinal Cord Injury/Brain Injury Trust Fund Board Membership List

(** - Governor appointed position)

1. Spinal Cord/Head Injury Person or Family Member**

Bob Setree

President, Southern Indiana Traumatic Brain Injury Foundation

2. Physician/Neurosurgeon**

*Position to be reappointed by the Governor

3. Physiatrist, Board Certified APMR**

*Position to be reappointed by the Governor

4. Technical Life Sciences Industry**

Ronald D. Henriksen

President and Chief Executive Officer, EndGenitor Technologies

Partner and Chief Investment Officer, Twilight Venture Partners

Chairman of Cytori Therapeutics, Inc.

5. Indiana University

Dr. Paul B. Nelson

Chairman and Betsy Barton Professor

Department of Neurological Surgery

Indiana University School of Medicine

6. Purdue University

Alan H. Rebar, DVM, PhD

Senior Associate Vice President for Research

and Executive Director of Discovery Park

Hovde Hall

7. National Spinal Cord Injury Association

Janeen Earwood, Director of Rehabilitation, American Senior Communities

8. Rehabilitation Hospital of Indiana

Annette Seabrook, Therapy Program Manager

Inpatient Spinal Cord and Orthopedic Programs

Rehabilitation Hospital of Indiana

9. American Brain Injury Association/Brain Injury Assoc. of Indiana

Lance E. Trexler, Ph.D, Director, Dept. of Rehabilitation Neuropsychology

and Program Director for Neurobehavioral Services

Rehabilitation Hospital of Indiana

Indiana Spinal Cord & Brain Injury Research Board Research Symposium April 17, 2008

On April 17, 2008 the Indiana Spinal Cord and Brain Injury Research Board held its first research symposium at the Indiana History Center in downtown Indianapolis. The program was well-received by the approximately 90 people who attended. Attendees were representative of several areas with an interest in spinal cord and brain injury, including neurosurgery, neuropsychology, vocational rehabilitation, trauma, injury prevention, traumatic brain injury survivors, universities and public health.

The symposium began with a welcome from Gerry Oxford, PhD, Stark Neurosciences Research Institute at the IU School of Medicine, and continued with Annette Seabrook, Physical Therapist, Rehabilitation Hospital of Indiana, and Chairperson of the Research Board. Ms. Seabrook related the history of the Indiana Spinal Cord and Brain Injury Research Fund and Board. Chuck Dietzen, MD, Crossroads Rehabilitation Center, the Timmy Foundation, and the Research Board, discussed the epidemiology and health care costs for spinal cord injury (SCI) and traumatic brain injury (TBI). Research projects were presented in both the morning and afternoon sessions, and attendees were introduced to the Indiana TBI grant and related programs. A panel discussion wrapped up the days events. The full list of presentations is below:

- Welcome: Gerry Oxford, PhD; Stark Neurosciences Research Institute; IU School of Medicine
- History of the Indiana Spinal Cord and Brain Injury Research Fund: Annette Seabrook, PT; Rehabilitation Hospital of Indiana; Chair, Indiana Spinal Cord and Brain Injury Research Board
- Scope of the Problem: Epidemiology/Health Care Costs for SCI and TBI: Chuck Dietzen, MD; Crossroads Rehabilitation Center; The Timmy Foundation; Indiana Spinal Cord and Brain Injury Research Board
- Neuroprotective and regenerative strategies for the repair of spinal cord injury: Xiao-Ming Xu, MD, PhD; IU School of Medicine
- Neuroimaging and Genetic Biomarkers in Traumatic Brain Injury Research: Andrew Saykin, PsyD, ABCN; IU Center for Neuroimaging, IU School of Medicine
- Computer Simulation of the Mechanics of Traumatic Brain Injury: Jim Caruthers, PhD; Purdue University, & Byron Pipes, NAE, IVA; Purdue University
- Peripheral axotomy & potential ways of preventing dendritic atrophy in spinal motoneurons: Dale Sengelaub, PhD; Indiana University, Bloomington
- A Summary of Frontiers in TBI and SCI Research: Timothy Pohlman, MD; IUSOM, Clarian Methodist Hospital
- A simple mean to overcome the metabolic and body composition deterioration in people with spinal cord injury: Ashraf Gorgey, PhD, PT; IU Dept. of Physical Therapy
- Introduction to Indiana TBI Grant, Resource Facilitation – Overview & Pilot Research Project: Laura Trexler, OTR, Brain Injury Association of Indiana, TBI Grant Program Director
- Assessing and Managing Delirium Following Traumatic Brain Injury?: Jacob Kean, PhD; Indiana University, Bloomington
- Prevention of Depression & Enhancing Cognitive Recovery with Duloxetine in TBI: Lance Trexler, PhD, Rehabilitation Hospital of Indianapolis

- Results of Phase 1 Trials of Oscillating Field Stimulators in Acute, Complete Spinal Cord Injury: Scott Shapiro, MD; IU School of Medicine; Wishard Health Services
- Panel Discussion: James Malec, PhD (Rehabilitation Hospital of Indianapolis); Alan Rebar, PhD (Purdue University); Gerry Oxford, PhD – facilitators
- Summation and Future Directions: Annette Seabrook, PT

The Board used information from presenters and attendees to guide its first research grant application process.