

**NJCSCR 2020**



# NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH

Annual Report State Fiscal Year 2020



# NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH

## 2020 ANNUAL REPORT

January 29, 2021

The Honorable Phil Murphy  
Governor of New Jersey  
Office of the Governor  
State House – P.O. Box 001  
Trenton, New Jersey 08625

Dear Governor Murphy:

On behalf of the New Jersey Commission on Spinal Cord Research, I am pleased to present the Annual Report for 2020.

Commission grant programs have increased the importance of spinal cord injury research, have brought new spinal cord injury researchers into the State of New Jersey and have laid the ground work for new research and leveraged additional grants and funding.

In 2020, the Commission awarded \$2.8 million in spinal cord injury research grant funding. Each of the funded research projects has the potential to contribute significantly to the development of treatments and cures for the paralysis and secondary complications that accompany spinal cord injury. These grants facilitate the basic research findings necessary to compete successfully for larger National Institutes of Health, and National Science Foundation awards.

We wish to thank you, and the State of New Jersey for continued support of spinal cord injury research.

Sincerely,  
  
John D. Del Colle  
Chairman



**State of  
New Jersey  
Commission on  
Spinal Cord  
Research**

# NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH

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**2020 ANNUAL REPORT**



**New Jersey Commission on Spinal Cord Research  
Members of the Commission**

**John Del Colle, Chairperson**

**Carolyn Daniels, D.H.Sc., M.Ed.**

**Carolann Murphy, PA**

**Loran C. Vocaturo, Ed.D.**

**Commission Personnel**

Christine Traynor, Administrator

Mary Ray, Fiscal Manager

***ACKNOWLEDGEMENTS***

The New Jersey Commission on Spinal Cord Research would like to express its sincere appreciation to all present and past Commission members, and the New Jersey Department of Health staff.

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# TABLE OF CONTENTS

<b>Members of the New Jersey Commission on Spinal Cord Research.....</b>	<b>i</b>
<b>Acknowledgements.....</b>	<b>i</b>
<b>Executive Summary.....</b>	<b>1</b>
<b>Introduction.....</b>	<b>2</b>
<b>New Jersey Spinal Cord Registry .....</b>	<b>3</b>
<b>New Jersey’s Commitment to Spinal Cord Research .....</b>	<b>3</b>
Mission and Goals.....	3
Objectives .....	4
Membership and Organization .....	5
Administration .....	6
Funding .....	6
<b>Research Funding Priorities .....</b>	<b>6</b>
<b>Grant Application and Review Process.....</b>	<b>7</b>
<b>Current Grant Programs.....</b>	<b>8</b>
<b>2001-2020 Summary and Performance Record .....</b>	<b>10</b>
<b>New Jersey Qualified Research Institutions .....</b>	<b>11</b>
<b>Commission Achievements .....</b>	<b>12</b>
<b>2020 Year In Review .....</b>	<b>12</b>
<b>Grant Programs For 2021 .....</b>	<b>13</b>
<b>COVID-19 Impact.....</b>	<b>13</b>
<b>Financial Statement.....</b>	<b>14</b>
<b>2020 Research Grant Awards .....</b>	<b>15</b>
<b>Attachment A – Spinal Cord Research Act.....</b>	<b>29</b>



# EXECUTIVE SUMMARY

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

## The New Jersey Commission on Spinal Cord Research was established in 1999 to fund spinal cord injury research projects in New Jersey.



Since 2001, the New Jersey Commission on Spinal Cord Research (Commission) has awarded over \$56 million to individual scientists at academic and research institutions and approved 240 separate scientific research projects.

- Since 2001, 211 scientific research projects have been completed.
  - Progress made by researchers has been presented in abstracts, scientific conferences, symposia, and meetings.
  - Commission programs have facilitated wider scientific interaction and numerous active research collaborations, along with out-of-state researchers.
- Success in achieving Commission funding has resulted in academic and career advancement for New Jersey researchers, including doctoral dissertations.
  - Numerous successful applications to the National Institutes of Health, the National Science Foundation and other organizations based on the Commission's grants have been made.

### ❖ Four grant programs were offered in Fiscal Year 2020:

- Individual Research Grants
- Exploratory Research Grants
- Postdoctoral and Graduate Fellowship Grants
- Spinal Cord Injury Techniques Training Travel Grants

### ❖ 2020 Achievements:

- Thirty-five applications requesting a total of \$11.1 million were submitted.
- Ten awards were made in 2020 totaling \$2,813,101.
- Four Individual Research Grants totaling \$2,000,000, three Exploratory Research Grants totaling \$598,101, two Fellowship Research Grants totaling \$210,000, and one Spinal Cord Injury Techniques Training Travel Grant totaling \$5,000 were approved.



# INTRODUCTION

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

## INTRODUCTION

This report is written in accordance with the enabling Statute, which stipulates that the Commission shall provide a report to the Governor and Legislature on the status of the Commission's activities and the results of its funded research efforts.<sup>1</sup>

The Spinal Cord Research Act created the New Jersey Commission on Spinal Cord Research and the New Jersey Spinal Cord Research Fund to support its activities. This Act resulted from the collaborative efforts of people with spinal cord injury and their families, clinicians, scientists, public officials, and representatives of research, rehabilitation and non-profit organizations.

## BACKGROUND

Spinal cord injuries can be some of the most devastating and life-changing injuries a person can sustain. Depending on the severity and location of the injury, a spinal cord injury can cause paralysis and death. Spinal cord injury has long been regarded as a virtually hopeless diagnosis with a grim prognosis. However, innovative approaches to rehabilitation and modern medicine have extended life expectancy from months to years and even decades. Many people with permanent injury can now live vital and productive lives. More recently, breakthroughs in research and new horizons in the life sciences are moving us closer to finding cures for spinal cord injuries.

Spinal cord injury impacts individuals and families across the State and nation. Though young men remain at greatest risk, the number of women and older people suffering a spinal cord injury is increasing. Motor vehicle crashes remain the leading cause of spinal cord injury, followed by falls and acts of violence such as gunshot wounds.<sup>2</sup>

The economic and human cost of these injuries remains huge. Better therapies are needed, and the task of research is more demanding than ever. Paralysis resulting from spinal cord injury may no longer be “an ailment not to be treated,” but the search for the answers remains among the greatest challenges to medical science and the healing arts.

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1. N.J.S.A. C.52:9E-1 et seq. Enabling statute is attached hereto as “Attachment A.”

2. National Spinal Cord Injury Facts and Figures at a Glance. <https://www.nscisc.uab.edu/Public/Facts%202016.pdf>.

# MISSION AND GOALS

## NJ COMMISSION ON SPINAL CORD RESEARCH 2020

### NEW JERSEY SPINAL CORD REGISTRY

The Spinal Cord Research Act mandated the establishment of a central registry of persons who sustain spinal cord injuries other than through disease, whether or not the injury results in a permanent disability. The Registry captures incidence and prevalence data on spinal cord injuries and serves as a resource for research, evaluation and information on spinal cord injuries.

### NEW JERSEY'S COMMITMENT TO SPINAL CORD RESEARCH

New Jersey is a leader in funding research aimed at the repair of spinal cord injuries. The Commission, created in 1999 under New Jersey's Spinal Cord Research Act, represents the successful culmination of years and determined effort to enlist New Jersey in the fight. The Commission offers research grant programs for both established scientists and younger researchers committed to spinal cord injury research.

Now in its 21<sup>st</sup> year of operation, the Commission has funded 253 scientific research projects and supported individual scientists at research institutions in New Jersey. Its impartial and scientifically rigorous application and review process has helped make the Commission vital to New Jersey's scientific investigators in their pursuit of developing effective therapies for spinal cord injury.

The Commission remains committed to broadening its portfolio of institutional grantees and increasing the size and diversity of its funding activities. Through outreach activities, the Commission encourages participation by all research organizations with an interest in spinal cord research.

## NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH

### 1. MISSION AND GOALS

The Commission's mission is to encourage and promote scientific research projects that advance the understanding of spinal cord injury and explore potential therapeutic strategies at qualifying research institutions in New Jersey. Through its grant programs and related activities, the Commission reinforces New Jersey's preeminence as a center of biomedical research, and a leader in neuroscience, neurotrauma and spinal cord research.

# MISSION AND GOALS

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

Simply stated, the Commission's goals are:

- To support meritorious research projects that advance the understanding of spinal cord injury and explore potential therapeutic strategies.
- To support the progression of research from bench to bedside.
- To enhance the reputation of New Jersey as a focus of biomedical research, and
- To facilitate the initiatives of New Jersey scientists to obtain larger grants from sources such as the National Institutes of Health and the National Science Foundation.



## 2. OBJECTIVES

The Commission is committed to accelerating research to develop effective interventions and cures for disabilities such as paralysis that are associated with spinal cord injury. Its primary objectives are:

- To develop and implement spinal cord research grant programs.
- To solicit, review, and administer grant awards in support of scientifically meritorious research projects.
- To promote development of spinal cord research projects that focus on treatments, cures, and on those that prevent or treat secondary biological conditions resulting from spinal cord injury, and
- To support the progression of research from laboratory to animal and clinical applications.

**More specifically, the Commission works to:**

- Advance the field of spinal cord research in New Jersey by encouraging established scientists to apply their expertise to spinal cord research.
- Foster collaborative, interdisciplinary approaches to spinal cord research.
- Nurture future generations of spinal cord researchers by supporting young scientists and postdoctoral fellows.
- Prevent or treat secondary biological conditions resulting from spinal cord injury, and
- Disseminate the research findings generated by scientists supported by the Commission.

# MEMBERSHIP AND ORGANIZATION

## NJ COMMISSION ON SPINAL CORD RESEARCH 2020

### 3. MEMBERSHIP AND ORGANIZATION

Created as a semi-independent public body, the Commission is “...allocated in, but not of...” the New Jersey Department of Health. The Commission is subject to all the administrative rules and procedures of the Department, but it is not a part of the Department’s budget.

The Commission establishes and oversees the administrative operations of the grant-making process as well as other program activities that are implemented by its administrative staff. Eleven uncompensated Commissioners are appointed by the Governor with the advice and consent of the Senate and serve three-year term.

The Commission will always have one or more individuals from each of the following institutions and categories.

The Commissioner of the New Jersey Department of Health, or designee, Rutgers, The State University of New Jersey; one representative of the federally designated Spinal Cord Injury Model System (Kessler Foundation); one representative from the American Paralysis Association (Christopher & Dana Reeve Foundation); and six public members - at least one licensed physician and one person with a spinal cord injury.

All public members shall be residents of the State, or otherwise associated with the State and should provide a diversity of backgrounds and interests united by a shared commitment to the cause of spinal cord research.<sup>3</sup>

Any qualified person wishing to be considered for appointment may submit his or her name to the Governor’s Office of Appointments.<sup>4</sup>

Public meetings are held at least four times a year. Members are recused from discussing or voting on matters in which they may have a potential conflict. A Chair and Vice Chairperson are elected and preside over all formal proceedings.

The Commission also maintains committees that meet and provide an informal structure to discuss issues on an ad hoc basis in advance of presenting them to the full Commission.

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3. New Jersey Statute (N.J.S.A.52:9E-1 et seq.)

4. New Jersey Statute (N.J.S.A.52:9E-1 et seq.) on the following website at: <http://www.state.nj.us/governor/admin/bca>

# RESEARCH FUNDING PRIORITIES

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

## 4. ADMINISTRATION

The Commission's administrative office provides the vital linkages and services to implement its programs and ensure the integrity of its operations. The administrative staff manages the day-to-day operations, including grant program administration, interaction with applicants and grantees, contract administration, budgeting and financial matters, record-keeping and reporting.

Administrative staff schedule and facilitate all activities, manage the scientific merit review process, negotiate with outside vendors, and maintain the necessary relationships within state government.

## 5. FUNDING

Under the enabling Statute, the work of the Commission is supported entirely by a one-dollar surcharge on all New Jersey traffic and motor vehicle fines or penalties. Monies generated from these fines or penalties are collected by the State Treasurer for deposit into the New Jersey Spinal Cord Research Fund. All grant programs and other activities are funded entirely from this dedicated source. No part of the operating budget is paid for out of New Jersey's general tax revenue.

## RESEARCH FUNDING PRIORITIES

The Research Program Guidelines set forth the Commission's scientific agenda, research criteria and areas of interest.<sup>5</sup> The guidelines offer applicants detailed guidance and instruction on funding criteria and policies.

The Commission funds research activities that hold promise of developing effective interventions and cures for paralysis and other consequences of spinal cord injury and disease. An array of grant programs is offered including Individual Research Grants, Fellowship Research Grants, Exploratory Research Grants, and Spinal Cord Techniques Training Travel Grants. The areas of research listed below highlight the focus of current emphasis and funding to:

- Study strategies to promote neuronal growth and survival, encourage the formation of synapses, enhance appropriate myelination, restore axonal conduction, replace injured cells, or otherwise improve function after spinal cord injury.
- Evaluate efficacy of drugs and other interventions that prevent or reduce secondary neuronal injury or providing insight into the mechanisms causing progressive damage.

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5. The full text appears on the website at: [www.nj.gov/health/njcsr](http://www.nj.gov/health/njcsr).

# GRANT APPLICATION AND REVIEW PROCESS

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

- Define anatomical characteristics of spinal cord injury or disease in well-defined animal models and in the human spinal cord, specifically documenting the cellular systems vulnerable to injury or disease and the functional losses which occur as a result thereof.
- Elucidate biological or physical mechanisms underlying approaches to improve functions compromised by spinal cord injury, e.g., bladder, bowel, and sexual function, and alleviate chronic pain, spasticity, and severe hypertension.
- Develop strategies to prevent or treat secondary complications arising from injury or disease to the spinal cord.
- Develop innovative restorative rehabilitation strategies to promote recovery of biological function.
- Translate basic and pre-clinical findings into clinical application.
- Support the investigation of promising new approaches.

## GRANT APPLICATION AND REVIEW PROCESS

The grants review process was modeled on the National Institutes of Health standards and procedures to provide an impartial and rigorous review of research proposals.<sup>6</sup> This effort has been largely successful and has earned respect from grantees and applicants.

### Application Process

The grant application process is now entirely electronic utilizing the State of New Jersey's System for Administering Grants Electronically (SAGE).<sup>7</sup> The online process ensures broad access, convenience, flexibility and greatly reduces administrative workloads for applicants, the Commission office, and the Scientific Merit Review Panel.

### Grant Review Process

The grant review process consists of a three-step review.

- First, all grant applications are reviewed by the Commission's administrative staff to ensure compliance with New Jersey Statutes and regulations and to ensure accuracy.
- Second, an independent relevance review is conducted by a three-person panel appointed by the office of the Commission. The panel determines the relevance of all applications to the Commission's mission, priorities and Research Program Guidelines, and will assign scientific reviewers for each proposal that meets the relevancy requirements. In the event the panel determines that an application does not meet those requirements, the application will be triaged, and will not be forwarded for independent scientific merit review.

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6. <https://www.nih.gov/sites/default/files/about-nih/nih-director/testimonies/nih-policies-procedures-promoting-scienc>

7. <https://njsage.intelligrants.com/Login2.aspx?APPTHEME=NJSAGE>



# GRANT APPLICATION AND REVIEW PROCESS

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

- Third, members of the Independent Scientific Merit Review Panel convene to evaluate all grant applications forwarded by the Independent Relevance Review Panel applying the criteria described below. This panel will assign scores to each application and make funding recommendations to the Commission. If it is determined that an ad hoc expertise is needed, additional scientific referees may be used.

## Recommendations and Authorization

The Independent Scientific Merit Review Panel will forward its recommendations to the Commission for final review and action. Grants triaged by either the Independent Relevance Review Panel and/or the Independent Scientific Merit Review Panel will not be forwarded to the Commission and will not be funded.<sup>8</sup>

## CURRENT GRANT PROGRAMS

Grant programs are designed to provide scientific opportunities attractive to a wide range of researchers. Awards are intended to promote collaboration among spinal cord researchers in New Jersey and encourage innovative research. The intent is not to provide long term support for research. It is expected that this initial support will lead investigators to acquire the necessary levels of preliminary data, so they may compete successfully for federal grant support.

The Individual Research Grant is designed to fund senior independent researchers, while the Fellowship Research Grant offers encouragement to graduate students and postdoctoral researchers. The Exploratory Research Grant enables researchers to apply innovative ideas from other areas of science to spinal cord injury and repair, and the Spinal Cord Injury Techniques Training Travel Grant offers applicants the ability to participate in training courses on spinal cord injury techniques.

Inter-institutional and/or inter-state collaboration is strongly encouraged. Complete details on all grant programs are available on the Commission's website.<sup>9</sup>

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8. The authority to authorize or not authorize grants is fully vested in the Commission according to New Jersey Statute (N.J.S.A. C.52:9E-1).

9. <https://nj.gov/health/spinalcord/>

# GRANT PROGRAMS

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

## INDIVIDUAL RESEARCH GRANTS

- Individual Research Grants support senior scientists to explore meritorious novel scientific and clinical ideas.
- Up to \$600,000 for up to three years (\$200,000 per year).
- A key goal is to enable established researchers to test and develop pilot data needed for future funding.

## FELLOWSHIP RESEARCH GRANTS

- Postdoctoral and Graduate Student Fellowships engage promising young investigators in spinal cord research.
- All fellowships include an annual stipend, research allowance and travel budget.
- Postdoctoral Fellowships run for three years with a total award of \$150,000; (\$50,000 per annum).
- Graduate Fellowships run for two years with a total award of \$60,000; (\$30,000 per annum).

## EXPLORATORY RESEARCH GRANTS

- Enable independent investigators to apply their specific expertise to spinal cord research.
- Develop preliminary data needed to justify higher levels of funding.
- Apply innovative ideas from other areas to spinal cord research.
- Encourage inter-institutional and/or inter-state collaborations.
- Allow up to \$200,000 for a two-year non-renewable grant.

## SPINAL CORD INJURY TECHNIQUES TRAINING TRAVEL GRANTS

- Offer applicants the ability to participate in training courses on spinal cord injury techniques.
- Applicants may select a course on their own or attend a course at either Rutgers, The State University of New Jersey, or the Spinal Cord Injury Research Training Program located at Ohio State University.
- A one-time per applicant non-renewable award of up to \$5,000 is provided.

# SUMMARY AND PERFORMANCE RECORD

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

## 2001-2020 SUMMARY AND PERFORMANCE RECORD

Since 2001, the Commission has invested \$59,509,922 in New Jersey scientists. Scientific interest in the field of spinal cord injury research remains strong due to the ongoing investment of these funds.

Approximately 35 grant applications are received annually; approval of ten or more new grant awards totaling \$2 to \$3 million are made.

Due to its continued investment in spinal cord injury research, the number of New Jersey researchers interested in the field is growing.

## GRANT APPLICATIONS

To date, the Commission has received 786 applications by scientists at New Jersey academic and research institutions. These awards represent an investment in spinal cord injury research, which cumulatively total \$210.5 million in grant funding requests.

The Commission has explored a range of grant programs that provide opportunities for both senior and young researchers, and larger programs for establishing new spinal cord research facilities and support for professorships.

Applications for Individual Research grants typically account for about two-thirds of the total. These projects are aimed at advancing the field in significant ways and result in scientific publications as well as additional funding.

## GRANT FUNDING AWARDS

Individual Research Grants awarded to established investigators are the mainstay of spinal cord research in New Jersey. These projects aim at advancing the field in significant ways and are most productive as measured by publications and applications for additional funding.

The Fellowship Research Grant program is the Commission's most cost-effective initiative, as measured by the number of researchers supported per grant dollar. The Commission is committed to bringing new researchers and promising students into the field. Its programs of graduate and postdoctoral Fellowships have been a success, in both numbers and qualified applicants.

# QUALIFIED RESEARCH INSTITUTIONS

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

## NEW JERSEY QUALIFIED RESEARCH INSTITUTIONS

Under the Spinal Cord Research Act, funds may only go to researchers affiliated with “New Jersey Qualified Research Institutions.” The following organizations have been designated as Qualified Research Institutions by the New Jersey Commission on Spinal Core Research.

- o Rutgers, The State University of New Jersey
- o Kessler Foundation
- o Princeton University
- o Coriell Institute for Medical Research
- o New Jersey Institute of Technology
- o VA New Jersey Health Care System & Veterans Biomedical Research Institute
- o Stevens Institute of Technology
- o Drew University
- o Hackensack Meridian Health JFK Medical Center – The Neuroscience Institute
- o Progenitor Cell Therapy, LLC
- o Hackensack Meridian School of Medicine at Seton Hall University
- o Wyeth Research/Pfizer
- o TRIM-edicine, Inc.
- o Rowan University
- o Cooper University Hospital & Cooper Medical School of Rowan University
- o Hackensack Meridian Health
- o Celvive, Inc.
- o Montclair State University
- o St. Joseph’s University Medical Center
- o GENERATION Biotech

The Commission is committed to broadening its portfolio of institutional grantees and increasing the size and diversity of its funding activities. Through outreach activities, the Commission encourages participation by all research organizations with an interest in spinal cord research.

## COMMISSION ACHIEVEMENTS

Although a cure for spinal cord injury remains elusive, the investment of millions of dollars by the Commission and other organizations has led to a wealth of new knowledge and insights that hold promise for effective therapies and cures. Below is a summary of the Commission's achievements:

- Grantees and their institutions have capitalized on the opportunities afforded by the availability of Commission funding. Scientific knowledge and careers have been advanced as well as institutional revenue and scientific achievements.
- The Commission has been a major factor in fostering the interest and continued involvement in spinal cord research within the State of New Jersey.
- Numerous scientific articles reporting on the work funded by Commission have appeared in peer-reviewed scientific publications, and several articles are about to be published. Progress made by researchers has been presented in numerous abstracts, scientific conferences, symposia, and meetings.
- The grant programs have facilitated greater scientific interaction and research collaborations, both in New Jersey and nationally.
- Success in achieving funding has resulted in academic and career advancement for New Jersey researchers, including doctoral dissertations. Applications to the National Institutes of Health, the National Science Foundation, and other organizations have been submitted, due to the work funded by the Commission.

## 2020 YEAR IN REVIEW

In 2020 the Commission witnessed its 21<sup>st</sup> year of operation and 25<sup>th</sup> grant cycle. Thirty-five applications were submitted with requests for funds totaling \$11.1 million.

### 2020 Overview and Applications

Ten applicants were awarded a total of \$2,813,101 in 2020. Four Individual Research Grants totaling \$2,000,000, three Exploratory Research Grants totaling \$598,101, two Fellowship Research Grants totaling \$210,000, and one Spinal Cord Techniques Training Travel Grant totaling \$5,000 were funded.

# GRANT PROGRAMS FOR 2021

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

## 2020 Outreach and Development Efforts

The Commission maintains an ongoing interest in expanding spinal cord injury research in New Jersey. Direct contacts, attendance at events and meetings, plus its website and publications are some of the resources used to publicize grant opportunities throughout the State.

## Publication of Grant Programs

Official Notices of Fund Availability advise interested parties of the Commission's grant programs. These notices are published annually on the Commission's website and in the New Jersey Department of Health's Directory of Grant Programs.<sup>10</sup> In Fiscal Year 2020, one grant cycle was offered; resulting in the availability of \$4 million for spinal cord research projects.

## 2020 Grant Cycle Information

Grant Application Deadline: May 1, 2019

Award Notification Date: November 29, 2019

Available Grant Programs:

- Individual Research Grants
- Exploratory Research Grants
- Fellowship Grants
- Spinal Cord Injury Techniques Training Travel Grants

## GRANT PROGRAMS FOR 2021

Due to the State of Emergency declared by Governor Phil Murphy to combat the Coronavirus pandemic, and the resulting financial impact to the New Jersey Commission on Spinal Cord Research's Trust Fund, the Fiscal Year 2021 grant cycle was cancelled.

## COVID-19 IMPACT

The impact to the State of New Jersey due to the COVID-19 pandemic has been severe. The overall financial impact to the New Jersey Commission on Spinal Cord Research's Trust Fund will not be known for some time. The decision to cancel the Fiscal Year 2021 grant cycle was difficult, but in the light of the impact of COVID19, it was the correct course of action to take. Incoming revenue to the Trust Fund continues to be significantly reduced. The Commission is hopeful to make available funding for new grants in the Fiscal Year 2022 grant cycle.



# FINANCIAL STATEMENT

NJ COMMISSION ON SPINAL CORD RESEARCH 2020

## FINANCIAL STATEMENT

The activities and programs of the Commission are supported by the New Jersey Spinal Cord Research Fund as established by the Act. A one-dollar surcharge is imposed on all fines or penalties from motor vehicle or traffic violations. This revenue surcharge is collected and forwarded to the New Jersey State Treasurer. The funds are then deposited annually in an interest-bearing account designated as the New Jersey Spinal Cord Research Fund.

### STATE FISCAL YEAR 2020 FUND BALANCE STATEMENT:

<b>FUND BALANCE STATEMENT:</b>			
	<b>SFY 2020</b> <i>Projected</i>	<b>SFY 2020</b> <i>Actual</i>	<b>SFY 2021</b> <i>Projected</i>
<b>Opening Fund Balance (July 1)</b>	\$899,225	\$492,977	\$322,236
<b>Revenues</b>			
Assessments <sup>1</sup>	\$3,720,000	\$2,874,517	\$1,750,000
Investments Earnings - Interest <sup>2</sup>	\$50,000	\$36,124	\$50,000
Total Revenue:	\$3,770,000	\$2,910,641	\$1,800,000
<b>Total Funds Available</b>	<b>\$4,669,225</b>	<b>\$3,403,618</b>	<b>\$2,122,236</b>
<b>Disbursements and Expenses</b>			
Spending Plan Reduction			\$ 43,790
Disbursements to Grantees <sup>3</sup>	\$3,500,000	\$2,827,291	\$0
Unexpended Grant funds		\$ (87,472)	
Total Disbursements:	\$3,500,000	\$ 2,739,819	\$ 43,790
<b>Expenses</b>			
Administrative & Office expense	\$310,000	\$298,673	\$140,000
Professional Review Panel	\$42,000	\$42,890	\$0
NJCSCR Registry	\$0	\$0	\$0
Total Expenses:	\$352,000	\$341,563	\$140,000
<b>Total Disbursements and Expenses</b>	<b>\$3,852,000</b>	<b>\$3,081,382</b>	<b>\$183,790</b>
<b>Closing Fund Balance (June 30)</b>	<b>\$817,225</b>	<b>\$322,236</b>	<b>\$1,938,446</b>

<sup>1</sup> Net revenue variance  
<sup>2</sup> Funds plus interest deposited annually in Jan.  
<sup>3</sup> Funds for Multi-year grants

## 2020 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

*Below is a project summary of the Individual Research Grant recipients:*

**CSCR20IRG005**

**Victoria Abraira, Ph.D.**

**Rutgers University - Cell Biology & Neuroscience**

**\$600,000**

***Improving Rehabilitation: The Spinal Cord Neural Systems Important for Functional Recovery after Injury***

Interventions that increase plasticity and regeneration are improving; this project identifies the neural systems and mechanisms that would be most effective to target such interventions.

Interventions that increase plasticity and regeneration after spinal cord injury (SCI) are improving, but little is known about the spinal cord neural systems that would be most appropriate to target such interventions. Rehabilitation, like treadmill walking, suggest a strong link between activity of sensory neurons in our limbs and motor recovery. Sensory information important for recovery is received and processed by the intermediate zone (IZ) of the spinal cord. This zone also contains neurons important for generating movement. Thus, therapeutic interventions should be tailored to most optimally engage the spinal cord IZ during recovery. However, there are a lot of different types of neurons within the IZ and few studies have actually tested the role of specific IZ neurons in functional recovery. Without this fundamental knowledge, appropriately targeting therapeutic interventions becomes very hard- much like trying to make a vaccine without first identifying the disease-causing virus. The reason progress has been slow, is because we don't have the appropriate tools to study specific spinal cord circuits (like IZ neurons) in health and injury.

Our research program has built an extensive mouse genetic toolkit to identify, visualize and test the function of specific spinal cord circuits in health and injury. We will use this toolkit to test the hypothesis that a very special class of spinal cord IZ neurons are responsible for interpreting sensory signals from the limb and translating this information to motor neurons that tell our muscles how to move as we walk. We will also test what happens to these neurons when the spinal cord is injured and how rehabilitation (like treadmill walking) help them make the right connections. To test if these neurons are part of key neural systems mediating recovery after injury, we will specifically remove these circuits from the injured animal to test if recovery gets worse. Lastly, we will implement machine learning approaches and artificial intelligence (AI) to track mouse movement in 3-dimensional space. We will use this technology to both test how these types of spinal cord neurons shape naturalistic behaviors (walking, running, rearing, etc.), but also to reveal the types of micro-movements that are most predictive of recovery after injury. By understanding the structure of movement after injury and how specific spinal cord neurons

## 2020 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

contribute to these movements, we can begin to tailor rehabilitation to specifically augment these mechanisms. Furthermore, implementing AI to characterize movement after injury will reveal the sensitive behavioral biomarkers needed to establish a fast, reliable and unbiased scale of functional recovery in rodents.

Our study provides both the essential framework and key tools to improve and expedite SCI therapeutic interventions. For example, clinicians using epidural stimulation to facilitate recovery need to tune electrical stimulation to recruit the right type of spinal cord circuits. This study will reveal the identity of these circuits; critical information which the clinician can immediately use to more specifically tune epidural stimulation. Another example are stem cell therapies. Stem cells transplanted into injured spinal cords can self-assemble and integrate into spinal cord circuits. However, to enhance regeneration, stem cells could be shaped prior to injection to more accurately resemble the topography of the intact spinal cord. Indeed, fundamental knowledge revealed by this project will be utilized to help instruct graft development toward network identities that facilitate proper integration. Lastly, current scales to track functional recovery in rodents are time consuming and expensive; requiring two highly trained individuals to perform. Our AI-based Behavioral Biomarker Scale (BBS) is a cheap, fast, reliable and unbiased functional recovery scale that will revolutionize the way rodent SCI research is performed.

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## 2020 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

*Below is a project summary of the Individual Research Grant recipients:*

**CSCR20IRG008**

**Juan Mena Segovia, Ph.D.**

**Rutgers University – Center for Molecular & Behavioral Neuroscience**

**\$600,000**

***Characterization of a Novel Descending Projection from the Mesencephalic Locomotor Region: Implications for Spinal Cord Injury Recovery***

We will test if MLR glutamatergic neurons that directly contact spinal cord neurons modulate motor activity and contribute to the compensatory changes that follow an incomplete spinal cord lesion.

Following a partial spinal cord injury, a series of changes occur in the brain to compensate for the loss of motor function. Among these changes, motor regions of the brain change their pattern of connections and develop new functions that allow the restoration of movement. Therefore, understanding these changes are critical to guide the recovery of patients suffering a spinal cord injury and offer new therapeutic strategies.

In our lab, we have recently discovered the existence of a novel connection between a region called the ‘mesencephalic locomotor region’, or MLR, and the spinal cord. We believe that this connection is key to understand the changes observed following a partial spinal cord lesion because the MLR, first, is highly connected with the regions of the brain controlling movement, and second, because these connections are further enhanced after a spinal cord lesion. In addition, using highly selective technologies for the identification of neurons in the MLR, we were able to interrogate their function in relation to movement. We found that these neurons influence the spinal cord and influence muscle activity. Our own evidence, together with published literature, strongly suggest that they have a central role in the changes that occur following a partial spinal cord injury. Here we propose a series of experiments to test this theory and evaluate the potential of this area to be used as a therapeutic target in the clinics.

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## 2020 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

*Below is a project summary of the Individual Research Grant recipients:*

**CSCR20IRG011**

**Bonnie L. Firestein, Ph.D.**

**Rutgers University - Cell Biology & Neuroscience**

**\$600,000**

### ***Cypin Inhibitors as Therapeutics for Neuropathic Pain after SCI***

We will optimize treatment with inhibitors of the protein cypin to decrease neuropathic pain occurring after SCI.

Neuropathic pain often occurs after spinal cord injury (SCI) and leads to a decreased quality of life. Previous reports support a role for inosine and guanine-based purines in pain sensitivity. Our group has identified a handful of drugs that activate and inhibit enzymes in the central nervous system that regulate the production of guanine-based purines. We have found that administration of inhibitors of the guanine metabolizing enzyme cypin increases mechanical pain threshold in female mice with spinal cord contusion injury.

We now propose to extend these studies in a larger number of mice and in both sexes of mice since pain mechanisms differ between the sexes. The value of such a study would be considerable, as it could provide information that could ultimately be used to decrease neuropathic pain after spinal cord injury. Thus, our hope is to develop novel therapies to improve quality of life after spinal cord injury.

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*Below are the project summaries of the Exploratory Research Grant recipients:*

**CSCR20ERG003**

**Brian Daniels, Ph.D.**

**Rutgers University - Cell Biology & Neuroscience - \$199,999**

### ***Investigating RIPK3 as a Driver of Inflammatory Astrocyte Activation in Spinal Cord Injury***

We will investigate the molecule RIPK3 as a candidate mechanism for pathogenic astrocyte activation in the context of spinal cord injury.

Traumatic injury to the spinal cord is marked by pathological immune responses in injured tissue. Following traumatic spinal cord injury (SCI), non-neuronal cells in the spinal cord called “astrocytes” become activated, causing them to proliferate and increase their expression of inflammatory genes. Recently, unique types of activated astrocytes have been described. One of these types are known as “A1” astrocytes, which promote neuroinflammation and neuronal cell death. A1 astrocytes have been observed in the spinal cord following SCI, though the cellular and molecular mechanisms that cause A1 astrocytes to develop in this context are unknown.

A strong candidate molecule for promoting A1 astrocyte formation following SCI is the protein RIPK3, an immunological signaling molecule with complex functions that promote both inflammation and cell death. Recent work has established that RIPK3 signaling is a potent inducer of neuroinflammation in a variety of neurodegenerative conditions, including Alzheimer’s disease and amyotrophic lateral sclerosis. In response, pharmacological inhibitors of this pathway are currently in phase II clinical trials for several inflammatory disorders of the central nervous system. While RIPK3 activation has been observed in the context of SCI, roles for this pathway in the promotion of neuroinflammation following injury have not yet been uncovered.

In this proposal, we will test the hypothesis that RIPK3 signaling is a driver of pathologic A1 astrocyte activation using mouse and cell culture models of SCI. These studies aim to uncover fundamental mechanisms of inflammatory astrocyte activation in the context of SCI, with the goal of identifying a new target for the treatment of neuroinflammation and neuronal cell death in the injured spinal cord.

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## 2020 RESEARCH GRANT AWARDS - EXPLORATORY RESEARCH GRANT RECIPIENTS

*Below are the project summaries of the Exploratory Research Grant recipients:*

**CSCR20ERG010**

**Francis Berthiaume, Ph.D.**

**Rutgers University – Biomedical Engineering**

**\$200,000**

### ***Elastin-Like Polypeptides Fused with FGF-2 and ARA290 for Spinal Cord Injury Repair***

The current study will investigate the efficacy of FGF-2-ELP and ARA290-ELP nanoparticles as a multi-modal treatment for SCI functional recovery. There are ~17,000 new cases of spinal cord injury (SCI) reported each year, and >250,000 individuals living with SCI in the United States. New Jersey alone reported ~600 cases annually of traumatic or non-traumatic SCI. It is a devastating trauma that leads to a sudden loss of motor, sensory, and autonomic nerve functions below the level of injury. SCI leads to a host of secondary health issues, such as chronic neuropathic pain, skin pressure ulcers, incontinence, respiratory problems, to name a few. Chronic pain is seen in more than 75% of SCI patients, and is often severe, with a strong negative impact on daily functioning. SCI patients tend to experience a greater number of socioeconomic and lifestyle risk factors for disease and pain. The primary mechanical insult to the spinal cord triggers a cascade of molecular and cellular events causing inflammation and edema, which lead to further tissue damage around the initial injury site, thus exacerbating the extent of the initial injury. While the initial injury has already taken place when the patient is admitted to the hospital, the secondary damage occurs over a period of hours to days and thus may be prevented, ultimately promoting faster and more complete recovery.

The main objective of this proposal is to develop new therapeutic compounds that protect the undamaged neural cells located in proximity to the site of injury and induce regeneration. The compounds consist of natural peptides that have known relevant biological activity, and which will be coupled with other naturally occurring peptides that have the ability to self-assemble into nanoparticles. The resulting nanoparticles are more stable, and have a long-lasting effect, such that they may only require a single application. The nanoparticles will be tested first on neuronal cells in culture to verify that they have biological activity. Subsequently, they will be tested in an animal model of SCI to show whether they promote recovery from SCI. If successful, the therapeutic compounds developed would be a new low-cost biologic pharmaceutical that improves patient outcomes. The regulatory process for commercialization may be facilitated because these compounds are made of peptides that occur naturally in the body. Overall, this project addresses the ongoing initiative of NJCSCR to develop new therapies to improve the care and quality of life of SCI patients.

## 2020 RESEARCH GRANT AWARDS - EXPLORATORY RESEARCH GRANT RECIPIENTS

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## 2020 RESEARCH GRANT AWARDS - EXPLORATORY RESEARCH GRANT RECIPIENTS

*Below are the project summaries of the Exploratory Research Grant recipients:*

**CSCR20ERG013**

**Rakesh Pilkar, Ph.D.**

**Kessler Foundation**

**\$198,102**

### ***A Novel System for Quasi Real-Time Tracking of Neuromuscular Response during Electrical Stimulation***

This study proposes a novel system for real-time assessment of artifact-free, high-quality responses of a stimulated muscle during neuromuscular electrical stimulation applications for SCI.

Spinal cord injury (SCI) is one of the most severe and life-altering injuries. The overwhelming statistics of SCI occurrences nationwide, as well as in New Jersey, and enormous treatment costs make the rehabilitation of these injuries increasingly important. In the absence of a cure, neuromuscular electrical stimulation (NMES) has been identified as one of the most effective rehabilitation strategies for recovery and treating the secondary complications after SCI. NMES operates on a basic principle that the application of electrical current can activate a paralyzed muscle. It has been reported that NMES interventions that involve voluntary participation from SCI patients are more effective in promoting recovery. However, such interventions are limited by lack of tools for monitoring effects of electrical stimulations (ES) specifically at the stimulated muscle during training. If voluntary participation is essential for NMES interventions to succeed, it is important to understand how much a muscle participates voluntarily, and how much ES contribute during training. Such information can help clinicians or researchers understand the relationship between ES and individual's own ability to activate a paralyzed muscle. With this information, the NMES interventions can be adjusted within session to extract optimal participation from patients and achieve maximal benefits. The need for a tool or a system for getting real-time information about a patient's muscle response is even more significant for individuals with complete SCI (cSCI) for whom the recovery in terms of movement may not be visible, but at muscle level it may be present. In the past, effects of NMES interventions have been assessed using the amount of force or torque generated at a joint. But this information is not specific to the stimulated muscle as the force or torque are generated using multiple muscles at a joint. Torque/force also fail to inform about how much a patient is contributing voluntarily and how much ES are contributing to the movement generated by ES. Surface electromyography (EMG) (electrical activity of muscles) recording provides a true physiological aspects of muscle function, interpretation of EMG during ES has been difficult to achieve due to the well-documented presence of overpowering interference of ES. With NJCSCR grant support, we were successful in developing and publishing a novel, accurate and efficient method (called as Empirical Mode Decomposition [EMD]-Notch filtering) to isolate 'true' muscle responses from

## 2020 RESEARCH GRANT AWARDS - EXPLORATORY RESEARCH GRANT RECIPIENTS

EMG data collected during FES applications for individuals with incomplete SCI (iSCI). As a next step, the objective of this study is to develop a novel system, called as SMARTq (Stimulated Muscle Assessment in Real Time) for NMES applications. Aim 1 of the study will focus on the design, development and validation of the SMARTq system using existing as well as experimental data from 5 able bodied, 5 iSCI and 5 cSCI. Aim 2 will focus on evaluating the usefulness of the SMARTq system as a feedback providing tool which could provide more accurate and effective feedback via artifact-free EMG and volitional participation than traditionally used torque. If successful, this novel system will allow the researchers or clinicians to monitor the effects of NMES at a muscle level during a training session. It will also allow them to observe contributions of patient's own participation as well as contributions of ES. This unique information, which was never accessible through traditional techniques (torque, force), will allow them not only to monitor the training sessions more effectively, but also allow them to modify NMES to get the best out of the patient as well as intervention. Hence, the outcomes of the proposed study complement NJCSCR's goals of development of novel techniques, methodologies, and models that could have a major impact on the field of SCI research and rehabilitation.

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## 2020 RESEARCH GRANT AWARDS - FELLOWSHIP RESEARCH GRANT RECIPIENTS

*Below are the project summaries of the Fellowship Research Grant recipients:*

**CSCR20FEL004**

**Nisha Singh**

**Rutgers University - Cell Biology & Neuroscience**

**\$60,000**

### ***Role of Guanine-Based Purines after SCI***

In this proposal, we will investigate the role of guanine metabolism after spinal cord injury and identify therapeutic agents that will improve outcome after injury.

Spinal cord injury (SCI) is characterized by an impact or force inflicted upon the spinal cord that results in tissue trauma from the death and damage of cells in the nervous system. This damage alters the signaling capabilities of these cells, preventing their proper communication with the brain and body. Such interferences in communication lead to pathologies, such as loss of motor function, loss of unconscious bodily functions such as bladder control, and increased pain sensitivity in patients. Additional disruption of cellular communication (secondary phase of injury) occurs and can cause further damage to the spinal cord, worsening these symptoms. Hence, development of treatments targeting the events that occur during this secondary phase of injury is crucial for improving patient recovery.

Although guanine is well known as a chemical building block of DNA, it also has other effects in the cell. For example, it can be converted to molecules that can promote neuron survival and reduce pain sensitivity after SCI. In this project, we will investigate how a key enzyme involved in this conversion of guanine to other molecules is regulated and can be therapeutically targeted.

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*Below are the project summaries of the Fellowship Research Grant recipients:*

**CSCR20FEL013**

**Bodhisatwa Das, Ph.D.**

**Rutgers University - Biomedical Engineering**

**\$150,000**

***MMP-9 Inhibition Via Controlled Release of Chemical Inhibitors for Chronic Pressure Ulcer Healing in Spinal Cord Injured Patients***

Pressure ulcer (PU), a major secondary complication of spinal cord injured patients to be treated by controlled release of drug molecules which inhibit the enzymes hindering the wound healing process.

Spinal cord injury (SCI) is one of the major neurological disorders mostly taking place due to accidents and occupational hazards. The spinal cord is the part of the brain coming down through the vertebral column in our back. Major nerves controlling our body sensation and responses are associated with the spinal cord. So, an SCI destabilizes this control and makes a patient partially or completely paralytic. As the sensations become weak and movements restricted, a patient sitting or lying down in the same posture creates high-pressure spots on the skin over hard bone specifically places like hip and back. These high-pressure spots in long run create ulcers called bed sores or pressure ulcers (PU). Due to the lack of sensation, the PUs often do not heal easily, progress continuously and create chronic deep injuries. Sometimes they become infected due to long-term contact with tissue fluids, moisture and lack of air circulation. This can lead to limb amputation, sepsis, and even patient death. In an injured tissue, a specific protein-degrading enzyme (MMP-9) is there which degrades the intermediary wound matrix (blood clot and surrounding hard tissue) and helps in healing by creating the path for new tissue to grow. In PU this enzyme is secreted in excess, and that even degrades every possible new tissue matrix allowing the wound to be unhealed for a very long time, and it impairs the healing process.

In current research work, we are proposing a bandage like protein matrix in which we will incorporate some drugs. These drugs will reduce this enzyme's activity for a prolonged period. The bandage is made of the same matrix in which an intermediate tissue is made in our body. So, whenever there will be more enzyme, the matrix will be degraded, and more drug will be released which will reduce the enzyme activity and allow the wound to heal. This cycle will go on in the same matrix until the wound healing is completed. Thus, this matrix drug composite will work as an automatic healing bandage for PU patients.

## 2020 RESEARCH GRANT AWARDS - FELLOWSHIP RESEARCH GRANT RECIPIENTS

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## 2020 RESEARCH GRANT AWARDS -

### SPINAL CORD TECHNIQUES TRAINING TRAVEL GRANT RECIPIENTS

#### *Spinal Cord Techniques Training Travel Grant Recipient:*

**CSCR20TTT003**

**Colm Atkins**

**Rutgers University**

**Cell Biology & Neuroscience**

**\$5,000**

Spinal cord injuries (SCI) are part of a spectrum of damage that can occur in the central nervous system (CNS). Our lab focuses on inflammatory injury to the CNS, as mediated by astrocytes. In addition to structural roles maintaining the blood-brain barrier (BBB) and physiologically supporting neurons, astrocytes mediate inflammatory responses to both sterile and microbial stimuli in the CNS. Astrocyte activation following traumatic SCI is well documented. Activated astrocytes have both protective and pathologic functions. Among the pathologic consequences of astrocyte activation following SCI is the prevention of recovery in damaged neuronal signaling networks, permanently impairing signaling through the lesion, and thus having a negative impact on sensory and motor functions in the injured individual. Our studies focus on inflammatory signaling through the kinases RIPK1 and RIPK3, which we propose as putative molecular drivers of pathogenic astrocyte activation. Signaling through RIPK1 and RIPK3 leads to an immunogenic form of programmed cell death known as “necroptosis.” Necroptotic cells undergo membrane permeabilization, resulting in the release of inflammatory damage associated molecular patterns. The subsequent immune response causes damage to adjacent cells, both due to direct inflammation and the infiltration of other immune modulating cells. We will study the activation and signaling of the RIPK1/RIPK3 pathway in astrocytes following SCI in mice. To prototype these studies, we are using SHSY-5Y cells, a human cell line derived from a neuroblastoma, to develop preliminary data to guide our *in vivo* studies. The purpose of this application is to obtain in-depth training in rodent models of contusion SCI to facilitate the expansion of these studies into *in vivo* models. We hope to identify novel interactions of the necroptotic signaling pathway with the pathogenesis and repair processes in SCI, with the goal of identifying targets for pharmacological modulation, improvement in behavioral outcomes, and symptom management.

My previous training has prepared me to undertake new projects in the field of SCI. During my postdoctoral fellowship, I worked extensively with murine models of infectious and inflammatory disease states. I am proficient at the handling of mice, hamsters, ferrets, and guinea pigs. Species-specific training was provided for all manipulations, including IP, IM, SQ, and ID injections. I am also experienced with diverse sample collection methods, including retroorbital bleeding from mice and hamsters, vena cava blood collection in guinea pigs and ferrets, and terminal cardiac puncture blood collection in mice and hamsters. This training will allow me to expand my animal research capabilities. Specifically, we will be able to safely manipulate and study mice with a physically damaged CNS. We can also combine these studies with our lab's

## 2020 RESEARCH GRANT AWARDS - SPINAL CORD TECHNIQUES TRAINING TRAVEL GRANT RECIPIENTS

other focus on infectious models of CNS damage to study potential comorbidities. An example of this would be a patient with limited mobility after a traumatic event who subsequently contracts an arboviral (such as Zika virus) infection. Studying the interplay of these two pathologic states would be both innovative and timely. Building expertise in both of these domains will result in a rare and unique combination of skills, which will promote innovative grant applications and collaborative studies at Rutgers and beyond.

Beyond my own work, our lab is heavily invested in the training and mentorship of undergraduates. Developing the skills necessary to perform SCI studies will allow us to transfer these skills to Rutgers undergraduate researchers. Combined with their work in primary cell culture and virology, training in SCI models will give them a unique skillset that will make them highly competitive for whatever careers they choose. This aspect of my training will support the goals of our department to promote innovative undergraduate training and produce competitive job candidates. As a Non-Tenure Track faculty member of the department, supporting Dr. Daniels' research program and training his students is the most significant part of my job description. This grant will allow me to help develop our research in the most innovative way possible.

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# ATTACHMENT A SPINAL CORD RESEARCH ACT

## ATTACHMENT A

### Spinal Cord Research Act

#### CHAPTER 201

**An Act** establishing a New Jersey Commission on Spinal Cord Research, supplementing Title 52 of the Revised Statutes and amending R.S.39:5-41.

**Be It Enacted** *by the Senate and General Assembly of the State of New Jersey:*

C.52:93E-1 Short title.

1. This act shall be known and may be cited as the “Spinal Cord Research Act.”

C.52:93E-2 Definitions relative to spinal cord research.

2. As used in this act:

a. “Approved research project” means a peer reviewed scientific research project, which is approved by the commission and which focuses on the treatment and cure of spinal cord injuries and diseases that damage the spinal cord.

b. “Commission” means the New Jersey Commission on Spinal Cord Research established pursuant to this act.

c. “Institutional support services” means all services, facilities, equipment, personnel and expenditures associated with the creation and maintenance of approved research projects.

d. “Qualifying research institution” means the University of Medicine and Dentistry of New Jersey; Rutgers, The State University; Princeton University; the Kessler Medical Rehabilitation Research and Education Corporation; the Coriell Institute for Medical Research; and any other research institution in the State approved by the commission.

C.52:93E-3 New Jersey Commission on spinal Cord Research.

3. a. There is established in the Executive Branch of the State government, the New Jersey Commission on Spinal Cord Research. For the purposes of complying with the provisions of Article V, Section IV, paragraph 1 of the New Jersey Constitution, the commission is allocated within the Department of Health and Senior Services, but notwithstanding that allocation, the

# ATTACHMENT A SPINAL CORD RESEARCH ACT

commission shall be independent of any supervision or control by the department or by any board or officer thereof.

b. The commission shall consist of 11 members, including the Commissioner of Health and Senior Services, or his designee, who shall serve ex officio; one representative of the University of Medicine and Dentistry of New Jersey; one representative of Rutgers, The State University; one representative of the federally designated Spinal Cord Injury Model System; one representative from the American Paralysis Association; and six public members who are residents of the State knowledgeable about spinal cord injuries and who include at least one physician licensed in this State and at least one person with a spinal cord injury. The members shall be appointed by the Governor with the advice and consent of the Senate.

c. The term of office of each appointed member shall be three years, but of the members first appointed, three shall be appointed for a term of one year, four for terms of two years, and three for terms of three years. All vacancies shall be filled for the balances of the unexpired terms in the same manner as the original appointments. Appointed members are eligible for reappointment upon the expiration of their terms. A member shall continue to serve upon the expiration of his term until a successor is appointed.

The members of the commission shall not receive compensation for their services, but shall be reimbursed for the actual and necessary expenses incurred in the performance of their duties as members of the commission.

C.52:93E-4 Responsibilities of commission.

4. The commission shall:

a. Review and authorize approved research projects, for which purpose the commission may establish an independent scientific advisory panel composed of scientists and clinicians who are not members of the commission to review proposals submitted to the commission and make funding recommendations to the commission;

b. Apportion all available funds to qualifying research institutions to finance approved research projects and necessary institutional support services;

c. Ensure that funds so apportioned to approved research projects are not diverted to any other use;

d. Take steps necessary to encourage the development within the State of spinal cord research projects;

## ATTACHMENT A SPINAL CORD RESEARCH ACT

- e. Compile a directory of all spinal cord research projects being conducted in the State; and
- f. Provide the Governor and the Legislature with a report by January 30 of each year describing the status of the commission's activities and the results of its funded research efforts.

C.52:93E-5 Authority of commission.

5. The commission is authorized to:

- a. Adopt rules and regulations concerning the operation of the commission, the functions and responsibilities of its officers and employees and other matters as may be necessary to carry out the purposes of this act;
- b. Maintain offices at such places within the State as it may designate;
- c. Employ an executive director and other personnel as may be necessary, whose employment shall be in the unclassified service of the State, except that employees performing stenographic or clerical duties shall be appointed pursuant to Title 11A (Civil Service) of the New Jersey Statutes;
- d. Design a fair and equitable system for the solicitation, evaluation and approval of proposals for spinal cord research projects;
- e. Apply for and accept any grant of money from the federal government, which may be available for programs relating to research on the spinal cord;
- f. Enter into contracts with individuals, organizations and institutions necessary or incidental to the performance of its duties and the execution of its powers under this act; and
- g. Accept gifts, grants and bequests of funds from individuals, foundations, corporations, governmental agencies and other organizations and institutions.

C.52:93E-6 Election, duties of officers.

6. The commission shall annually elect a chairman and a vice-chairman from among its members. The chairman shall be the chief executive officer of the commission, shall preside at all meetings of the commission and shall perform other duties that the commission may prescribe.

The executive director shall serve as secretary to the commission and shall carry out its policies under the direction of the chairman.

# ATTACHMENT A SPINAL CORD RESEARCH ACT

C.52:9E-7 Direct application for funds permitted.

7. Nothing in this act shall preclude a qualifying research institution or any other research facility in the State from directly applying for or receiving funds from any public or private agency to conduct spinal cord research.

C.52:93E-8 Establishment, maintenance of central registry.

8. a. The commission shall establish and maintain, in conjunction with the Department of Health and Senior Services, a central registry of persons who sustain spinal cord injuries other than through disease, whether or not the injury results in a permanent disability, in order to provide a database that indicates the incidence and prevalence of spinal cord injuries and which will serve as a resource for research, evaluation and information on spinal cord injuries and available services.

b. The commission shall require the reporting of all cases of spinal cord injuries, except those caused through disease, and the submission of specified additional information on reported cases as it deems necessary and appropriate.

The commission shall, by regulation, specify the health care facilities and providers required to make the report of a spinal cord injury to the registry, information that shall be included in the report to the registry, the method for making the report and the time period in which the report shall be made.

c. The reports made pursuant to this section are to be used only by the commission and the Department of Health and Senior Services and such other agencies as may be designated by the commission or the department and shall not otherwise be divulged or made public so as to disclose the identity of any person to whom they relate; and to that end, the reports shall not be included under materials available to public inspection pursuant to P.L.1963, c.73 (C.47:1A-1 et seq.).

d. No individual or organization providing information to the commission in accordance with this section shall be deemed to be, or held liable for, divulging confidential information. Nothing in this section shall be construed to compel any individual to submit to medical, commission or department examination or supervision.

e. A health care facility or health care provider who is required to report a spinal cord injury to the commission that fails to comply with the provisions of this section shall be liable to a penalty of up to \$100 per unreported spinal cord injury case. A penalty sued for under the provisions of this section shall be recovered by and in the name of the commission and shall be deposited in the "New Jersey Spinal Cord Research Fund" established pursuant to this act.

# ATTACHMENT A SPINAL CORD RESEARCH ACT

C.52:93E-9 “New Jersey Spinal Cord Research Fund.”

9. a. There is established in the Department of the Treasury a nonlapsing revolving fund to be known as the “New Jersey Spinal Cord Research Fund.” This fund shall be the repository for moneys provided pursuant to subsection e. of R.S.39:5-41. Moneys deposited in the fund, and any interest earned thereon, shall be used exclusively for the purpose of making grants for approved spinal cord research projects at qualified research institutions.

b. Any costs incurred by the department in the collection or administration of the fund may be deducted from the funds deposited therein, as determined by the Director of the Division of Budget and Accounting.

10. R.S.39:5-41 is amended to read as follows:

Fines, penalties; forfeitures, disposition of; exceptions.

39:5-41. a. All fines, penalties and forfeitures imposed and collected under authority of law for any violations of R.S.39:4-63 and R.S.39:4-64 shall be forwarded by the judge to whom the same have been paid to the proper financial officer of a county, if the violation occurred within the jurisdiction of that county’s central municipal court, established pursuant to N.J.S.2B:12-1 et seq. or the municipality wherein the violation occurred, to be used by the county or municipality to help finance litter control activities in addition to or supplementing existing litter pickup and removal activities in the municipality.

b. Except as otherwise provided by subsection a. of this section, all fines, penalties and forfeitures imposed and collected under authority of law for any violations of the provisions of this Title, other than those violations in which the complaining witness is the director, a member of his staff, a member of the State Police, a member of a county police department and force or a county park police system in a county that has established a central municipal court, an inspector of the Board of Public Utilities, or a law enforcement officer of any other State agency, shall be forwarded by the judge to whom the same have been paid as follows: one-half of the total amount collected to the financial officer, as designated by the local governing body, of the respective municipalities wherein the violations occurred, to be used by the municipality for general municipal use and to defray the cost of operating the municipal court; and one-half of the total amount collected to the proper financial officer of the county wherein they were collected, to be used by the county as a fund for the construction, reconstruction, maintenance and repair of roads and bridges, snow removal, the acquisition and purchase of rights-of-way, and the purchase, replacement and repair of equipment for use on said roads and bridges therein. Up to 25% of the money received by a municipality pursuant to this subsection, but not more than the actual amount budgeted for the municipal court, whichever is less, may be used to upgrade case processing.



## ATTACHMENT A SPINAL CORD RESEARCH ACT

All fines, penalties and forfeitures imposed and collected under authority of law for any violations of the provisions of this Title, in which the complaining witness is a member of a county police department and force or a county park police system in a county that has established a central municipal court, shall be forwarded by the judge to whom the same have been paid to the financial officer, designated by the governing body of the county, for all violations occurring within the jurisdiction of that court, to be used for general county use and to defray the cost of operating the central municipal court.

Whenever any county has deposited moneys collected pursuant to this section in a special trust fund in lieu of expending the same for the purposes authorized by this section, it may withdraw from said special trust fund in any year an amount which is not in excess of the amount expended by the county over the immediately preceding three-year period from general county revenues for said purposes. Such moneys withdrawn from the trust fund shall be accounted for and used as are other general county revenues.

c. (Deleted by amendment, P.L.1993, c.293.)

d. Notwithstanding the provisions of subsections a. and b. of this section, \$1.00 shall be added to the amount of each fine and penalty imposed and collected under authority of any law for any violation of the provisions of Title 39 of the Revised Statutes or any other motor vehicle or traffic violation in this State and shall be forwarded by the person to whom the same are paid to the State Treasurer. In addition, upon the forfeiture of bail, \$1.00 of that forfeiture shall be forwarded to the State Treasurer. The State Treasurer shall annually deposit those moneys so forwarded in the "Body Armor Replacement" fund established pursuant to section 1 of P.L.1997, c.177 (C.52:17B-4.4). Beginning in the fiscal year next following the effective date of this act, the State Treasurer annually shall allocate from those moneys so forwarded an amount not to exceed \$400,000 to the Department of Personnel to be expended exclusively for the purposes of funding the operation of the "Law Enforcement Officer Crisis Intervention Services" telephone hotline established and maintained under the provisions of P.L.1998, c.149 (C.11A:2-25 et al.).

e. Notwithstanding the provisions of subsections a. and b. of this section, \$1 shall be added to the amount of each fine and penalty imposed and collected under authority of any law for any violation of the provisions of Title 39 of the Revised Statutes or any other motor vehicle or traffic violation in this State and shall be forwarded by the person to whom the same are paid to the State Treasurer. The State Treasurer shall annually deposit those moneys so forwarded in the "New Jersey Spinal Cord Research Fund" established pursuant to section 9 of P.L.1999, c.201 (C.52:9E-9). In order to comply with the provisions of Article VIII, Section II, paragraph 5 of the State Constitution, a municipal or county agency which forwards moneys to the State Treasurer pursuant to this subsection may retain an amount equal to 2% of the moneys which it collects pursuant to this subsection as compensation for its administrative costs associated with implementing the provisions of this subsection.

# ATTACHMENT A SPINAL CORD RESEARCH ACT

C.52:93E-10 Rules, regulations pertinent to spinal cord research.

11. The commission shall adopt such regulations pursuant to the “Administrative Procedure Act,” P.L.1968, c.410 (C.52:14B-1 et seq.) as are necessary to carry out the provisions of this act.

12. This act shall take effect on the 90th day following enactment.

Approved September 13, 1999.