

**NJCSCR 2019**



# NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH

Annual Report State Fiscal Year 2019





# NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH

## 2019 ANNUAL REPORT

January 30, 2020

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:

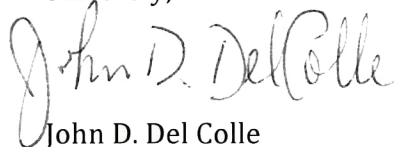
On behalf of the New Jersey Commission on Spinal Cord Research, I am pleased to present the Annual Report for 2019.

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 2019, the Commission awarded \$3.4 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,

A handwritten signature in black ink that reads "John D. Del Colle". The signature is written in a cursive style with a large initial "J".

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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**2019 ANNUAL REPORT**



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

**John Del Colle, Chairperson  
Peter W. Carmel, M.D.  
Carolyn Daniels, D.H.Sc., M.Ed.  
Susan P. Howley  
Carolann Murphy, PA  
Michael J. Rhode  
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.

**Commission Office**

225 East State Street, 2nd Floor West  
P.O. Box 360, Trenton, New Jersey 08625  
(609) 292-4055 - Phone  
(609) 943-4213 - Fax



# 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>
<b>New Jersey Commission on 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>2001-2019 Summary and Performance Record .....</b>	<b>10</b>
<b>New Jersey Qualified Research Institutions .....</b>	<b>11</b>
<b>Commission Achievements .....</b>	<b>11</b>
<b>2019 Year In Review .....</b>	<b>12</b>
<b>Grant Programs For 2020 .....</b>	<b>13</b>
<b>Financial Statement.....</b>	<b>14</b>
<b>2019 Research Grant Awards .....</b>	<b>15</b>
<b>Attachment A – Spinal Cord Research Act.....</b>	<b>31</b>

# EXECUTIVE SUMMARY

NJ COMMISSION ON SPINAL CORD RESEARCH 2019

## 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, 196 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 2019:

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

### ❖ 2019 Achievements:

- Thirty-seven applications requesting a total of \$11.6 million were submitted.
- Eleven awards were made in 2019 totaling \$3,410,418.
- Five Individual Research Grants totaling \$2,938,418, two Exploratory Research Grants totaling \$400,000, one Fellowship Research Grant totaling \$60,000, and three Spinal Cord Injury Techniques Training Travel Grants totaling \$12,000 were approved.



# INTRODUCTION

NJ COMMISSION ON SPINAL CORD RESEARCH 2019

## 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 2019

## 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 20<sup>th</sup> year of operation, the Commission has funded 240 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 2019

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 2019

### 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 2019

## 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 2019

- 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

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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 2019

requirements, the application will be triaged, and will not be forwarded for independent scientific merit review.

- 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 2019

## 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 2019

## 2001-2019 SUMMARY AND PERFORMANCE RECORD

Since 2001, the Commission has invested \$56,705,220 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 751 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 2019

## 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



# 2019 YEAR IN REVIEW

## NJ COMMISSION ON SPINAL CORD RESEARCH 2019

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.

## 2019 YEAR IN REVIEW

In 2019 the Commission witnessed its 20th year of operation and 24<sup>th</sup> grant cycle. Thirty-seven applications were submitted with requests for funds totaling \$11.6 million.

### 2019 Overview and Applications

Eleven applicants were awarded a total of \$3,410,418 in 2019. Five Individual Research Grants totaling \$2,938,418, two Exploratory Research Grants totaling \$400,000, one Fellowship Research Grant totaling \$60,000, and three Spinal Cord Techniques Training Travel Grants totaling \$12,000 were funded.

### 2019 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

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10. NJ Department of Health Directory of Grant Programs: [www.healthapps.state.nj.us/noticeofgrant/noticegrants.aspx](http://www.healthapps.state.nj.us/noticeofgrant/noticegrants.aspx)

# 2019 YEAR IN REVIEW

## NJ COMMISSION ON SPINAL CORD RESEARCH 2019

Department of Health's Directory of Grant Programs.<sup>10</sup> In Fiscal Year 2019, one grant cycle was offered; resulting in the availability of \$3.1 million for spinal cord research projects.

### 2019 Grant Cycle Information

Grant Application Deadline: December 10, 2018

Award Notification Date: April 30, 2019

Available Grant Programs:

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

## GRANT PROGRAMS FOR 2020

For Fiscal Year 2020, an estimated \$4 million has been allocated for spinal cord injury research projects. The Commission authorized one grant cycle for Fiscal Year 2020 offering Individual Research Grants, Fellowship Research Grants, Exploratory Research Grants and Spinal Cord Injury Techniques Training Travel Grants.

### 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

## 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.

# FINANCIAL STATEMENT

NJ COMMISSION ON SPINAL CORD RESEARCH 2019

## STATE FISCAL YEAR 2019 FUND BALANCE STATEMENT:

	SFY 2019 <i>Projected</i>	SFY 2019 Actual	SFY 2020 <i>Projected</i>
<b>Opening Fund Balance (July 1)</b>	\$1,183,527	\$963,130	\$899,225
<b>Revenues</b>			
Assessments <sup>1</sup>	\$3,720,000	\$3,796,085	\$3,720,000
Investments Earnings - Interest <sup>2</sup>	\$50,000	\$73,874	\$50,000
Total Revenue:	\$3,770,000	\$3,869,960	\$3,770,000
<b>Total Funds Available</b>	\$4,953,527	\$4,833,090	\$4,669,225
<b>Disbursements and Expenses</b>			
Spending Plan Reduction			
Disbursements to Grantees <sup>3</sup>	\$3,800,000	\$3,610,418	\$3,500,000
Total Disbursements:	\$3,800,000	\$3,610,418	\$3,500,000
<b>Expenses</b>			
Administrative & Office expense	\$310,000	\$292,743	\$310,000
Professional Review Panel	\$42,000	\$30,704	\$42,000
NJCSCR Registry	\$0	\$0	\$0
Total Expenses:	\$352,000	\$323,447	\$352,000
<b>Total Disbursements and Expenses</b>	\$4,152,000	\$3,933,865	\$3,852,000
<b>Closing Fund Balance (June 30)</b>	\$801,527	\$899,225	\$817,225

<sup>1</sup>Net revenue variance

<sup>2</sup>Funds plus interest deposited annually in January

<sup>3</sup>Funds for Multi-year grants

## 2019 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

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

**CSCR19IRG012**

**Michael Matisse, Ph.D.**

**Rutgers University Biomedical & Health Sciences**

**Robert Wood Johnson Medical School - \$600,000**

**Project Title: *Restoration of Tissue Homeostasis by Hh-Responsive Astrocytes Following Spinal Cord Injury.***

We will test whether Hh signaling is required in a newly identified subset of functionally and molecularly distinct astrocytes for their role in repairing the blood-brain barrier following SCI.

The goal of the proposed project is to gain a better understanding of the cellular and molecular mechanisms that regulate the response to, and repair of, traumatic spinal cord injuries (SCI) in a rodent model system. We have discovered that a subset of glial cell (astrocytes) exhibit unique properties that distinguish them from other similar cells in the spinal cord. In particular, these cells are under the control of an important signaling pathway mediated by a secreted factor known as Sonic Hedgehog (Shh). These cells exhibit a unique function in that they appear to comprise a subset of astrocytes that respond to SCI by migrating to the injury site. There, our data suggests that they play a key role in repairing damage to the blood-brain/spinal cord barrier (BBB), a critical diffusion barrier that normally inhibits the infiltration of circulating plasma proteins and compounds into the CNS from the blood stream and in doing so maintains its unique “privileged” immune status. Disruption of the BBB commonly occurs following SCI and can lead to numerous secondary consequences. BBB disruption is also recognized as a critical early event in the etiology of many diseases affecting the CNS and spinal cord, including Multiple Sclerosis (MS) and Amyotrophic Lateral Sclerosis (ALS). Functional recovery from SCI requires the restoration of normal BBB function. However, our current knowledge of the specific roles that different spinal cord cell types and signaling pathways play in maintaining or repairing the BBB is lacking.

Our study will comprise two specific aims. In Aim 1 we will test the hypothesis that these specific, genetically and functionally unique GM astrocytes are required to establish and/or maintain the BBB after penetrating spinal cord lesions that model traumatic SCI. These studies will combine conditional mutagenesis, genetic lineage tracing, and surgically induced SCI.

**Contact Information:**

Michael Matisse, Ph.D.

Rutgers BHS RWJMS/Dept. Neuroscience & Cell Biology

675 Hoes Lane West Piscataway, NJ 08854-3925

732-235-3471

[matisemp@rwjms.rutgers.edu](mailto:matisemp@rwjms.rutgers.edu)

## 2019 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

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

**CSCR19IRG018**

**Trevor Dyson-Hudson, Ph.D.**

**Kessler Foundation - \$548,468**

***Project Title: Autologous Micro-Fragmented Adipose Tissue Injection for Shoulder Overuse Injuries in Wheelchair Users with Spinal Cord Injury: A Randomized Controlled Trial***

This is a randomized controlled trial to determine the efficacy of autologous micro-fragmented adipose tissue injection for recalcitrant rotator cuff disease in persons with spinal cord injury.

The overall purpose of this study is to determine the effectiveness of autologous, micro-fragmented adipose tissue injection in the treatment of a chronic shoulder pain in individuals with spinal cord injury (SCI). Shoulder pain is a common medical complication occurring in those with SCI and is caused by overuse due to an increased reliance on the upper limbs for wheelchair mobility and other activities of daily living. Often referred to as “wheelchair user’s shoulder”, shoulder pain can lead to substantial disability in individuals with SCI, resulting in decreased functional independence and increasing the risk for other medical complications.

Although shoulder pain has long been recognized as a significant problem in individuals with SCI, very little research has been conducted to identify suitable treatments. Current guidelines recommend conservative treatments such as rest, medications such as nonsteroidal anti-inflammatory drugs and corticosteroid injections, modalities such as heat, ice, and ultrasound, and exercises. Unfortunately, the effectiveness of these treatments in individuals with spinal cord injury is unknown and some are known to have negative side-effects or may be inappropriate for individuals with SCI. If these treatment options fail, then rotator cuff surgery may be the only option. There is clearly a need for further research into appropriate treatments for chronic shoulder pain in individuals with SCI that are effective, have minimal side effects, and maintain functional independence.

Regenerative medicine focuses on the repair or replacement of tissue lost to injury, disease, or age through self-healing and cell-based-therapies. Micro-fragmented adipose tissue injection is a type of regenerative medicine and rehabilitative medicine treatment that uses a person’s fat or adipose tissue to fill joint and muscle defects, like shoulder injuries. Adipose tissue is also thought to contain growth factors and cells that may stimulate tissue healing. There is some evidence that an adipose tissue injection alleviates shoulder pain in able-bodied individuals who have shoulder pain. Results from a recent study in a small group of individuals with SCI who had shoulder pain were also promising. However, in order to better understand how this treatment works and whether it is



## 2019 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

effective, we need to continue studying it in a larger group of individuals with SCI and compare it to a conventional treatment, such as a corticosteroid injection.

The purpose of this study is to determine the effectiveness of micro-fragmented adipose tissue injection in the treatment of a chronic shoulder pain in persons with SCI. During the course of this study, 28 individuals with chronic SCI who have shoulder pain that has not responded to regular, conservative treatment will be randomly assigned (by a coin toss) to one of two treatment groups: 1) a micro-fragmented adipose tissue injection treatment group; or 2) an alternate (“control”) group treated with a traditional corticosteroid injection. We will then follow people for six months to see how both treatments work and to compare changes in shoulder pain and function. Our goal is to show that micro-fragmented adipose tissue injection works better than conventional treatments to alleviate chronic shoulder pain in individuals with SCI and potentially improve their quality of life. Achievement of the proposed goals will have a significant impact on the treatment of shoulder pain in persons with SCI. This study will identify an effective and promising rehabilitative treatment that will be an alternative to rotator cuff surgery in people with SCI who have overuse-related shoulder pain that does not respond to conventional treatments.

**Contact Information:**

Trevor Dyson-Hudson, Ph.D.

Kessler Foundation

1199 Pleasant Valley Way

West Orange, NJ 07052

973-324-3576

[tdysonhudson@kesslerfoundation.org](mailto:tdysonhudson@kesslerfoundation.org)

## 2019 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

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

**CSCR19IRG021**

**Erica Weber, Ph.D.**

**Kessler Foundation - \$592,177**

***Project Title: Development and Validation of an Abbreviated Cognitive Screening Battery for Individuals with Spinal Cord Injury***

This project will validate the use of a brief, abbreviated cognitive screening battery, developed from established, motor-free neuropsychological tests that are sensitive to SCI-related impairment.

Traumatic spinal cord injury (SCI) is a significant public health concern as it affects approximately 17,500 persons in the US per year, who incur lifetime costs ranging from \$1.6 to \$4.8 million each. Researchers and clinicians alike have begun to pay greater attention to cognitive difficulties in persons with SCI, as many individuals experience problems with their thinking abilities (like memory and attention) after sustaining their injury. These cognitive problems often cause problems in the daily lives of persons with SCI, as it can affect their ability to benefit from other types of rehabilitation (PT, OT), how independently they are able to care for themselves, and how well they can re-integrate into their communities. As such, assessment of cognition is important to promoting positive health and everyday outcomes in those with SCI. Despite this need to evaluate thinking abilities after SCI, cognitive functioning is not usually assessed in individuals with SCI in the clinic, most likely because it is time- and labor-intensive, expensive, and often requires hand and arm functioning for completion of many cognitive tests.

This project proposal seeks to develop and test a brief cognitive screening tool, created from abbreviated portions of common, well-regarded, motor-free neuropsychological tests. A total of 240 participants with SCI (recruited by three current or recent SCI Model System sites: Kessler Foundation, Craig Hospital, and the University of Washington) will undergo an assessment of cognitive functioning, in the context of a broader evaluation that will help us better understand their medical history, mental health symptoms, quality of life, and daily living. Supported by our strong preliminary data, previous experience in carrying out similar projects in other neurological disorders, and the expertise of our multi-site SCIMS-based team, the rigorous testing of this collection of abbreviated tests as proposed by this study protocol will allow cognitive screening to become more routine and valuable in SCI clinics. In turn, this project will yield critical advancements in the field that improve resource-effectiveness of neuropsychological referrals, lead to greater identification of cognitive impairment, and ultimately enhance important health and daily living outcomes for individuals with SCI.

## 2019 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

**Contact Information:**

Erica Weber, Ph.D.

Kessler Foundation

120 Eagle Rock Avenue, Suite 100

East Hanover, NJ 07936

973-324-8451

[eweber@kesslerfoundation.org](mailto:eweber@kesslerfoundation.org)

## 2019 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

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

**CSCR19IRG019**

**Nancy Chiaravalloti, Ph.D.**

**Kessler Foundation - \$597,773**

**Project Title: *Longitudinal Changes in Cognition and Hemodynamics in Individuals with Spinal Cord Injury***

We will document longitudinal changes in SCI compared to healthies in cognitive, cardio and cerebrovascular function, as well as their relationship to each other and patterns of cerebral activation.

The general population is aging; today 12% of the US population is older than 65 and it is estimated that by 2020 the number of people in the US older than 65 will outnumber children younger than 5. Similar to the general population, the spinal cord injury (SCI) population is also aging and it is estimated that 14% of persons with SCI are older than 60. However, despite the fact that persons with SCI are living longer, life expectancy remains below that of the general population, with cardiovascular and cerebrovascular diseases accounting for more than 25% of all deaths since 1995. It has been proposed that the SCI population represents a model of accelerated cardiovascular aging and that decentralized cardiovascular autonomic control may play a role.

Similar to the non-injured population, as people with SCI get older, they are faced with the increased likelihood of developing age-associated diseases like cardiovascular disease and stroke (cerebrovascular disease). In fact, people with SCI are 5-times more likely to have had a stroke than people without SCI, which may be due to the secondary complications of the SCI, such as the inability to control heart rate and blood pressure. Furthermore, because of damage to the nervous system it is often more difficult to prevent and treat diseases and illness in the SCI population, which may worsen disease progression and reduce life expectancy. In addition to cardiovascular and cerebrovascular disease, people with SCI are reported to have impaired thinking (cognitive) abilities at a relatively young age, and as many as 60% of individuals with SCI have functional deficits in memory, information processing and executive function. In the general population, there is an association between aging and the development of cognitive deficits that may be related to cardiovascular and cerebrovascular dysfunction.

Recent evidence from our group has documented a significant relationship between cardiovascular and cerebrovascular dysfunction and poorer cognitive performance in person with SCI. We have additionally shown changes in the way the brain processes and remembers information in persons with SCI. However, understanding how cardiovascular, cerebrovascular and cognitive function

## 2019 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

change over time in persons with SCI compared to age-matched controls, will aid in the development of timely intervention strategies to prevent or ameliorate the pronounced functional deficits reported in the SCI population. The currently proposed project represents an important step forward in a continuing line of work that aims to understand the etiology of the prevalent cognitive disorders in the SCI population to develop and guide clinical treatment strategies in promoting independence, social integration and overall quality of life of persons living with SCI. We will document 3-5 years and 6-8 year longitudinal changes in individuals with SCI compared to age-matched healthy controls. We will compare cognitive, cardiovascular and cerebrovascular function between the groups, explore the relationship between cognitive dysfunction and cardiovascular and cerebrovascular dysfunction among persons with SCI as compared to AM healthy controls and determine regional patterns of cerebral activation on fMRI in individuals with SCI as compared to healthy controls. We will additionally examine the incidence of dementia in persons with SCI based on individuals in our longitudinal cohort. There are few studies examining the frequency of dementia in this population. It is particularly important to understand the relative dementia risk in this population given the increased prevalence of cognitive deficits consistently reported in persons with SCI and the fact that the SCI population is aging.

**Contact Information:**

Nancy Chiaravalloti, Ph.D.

Kessler Foundation

120 Eagle Rock Avenue, Suite 100

East Hanover, NJ 07936

973-324-8440

[nchiaravalloti@kesslerfoundation.org](mailto:nchiaravalloti@kesslerfoundation.org)

## 2019 RESEARCH GRANT AWARDS - INDIVIDUAL RESEARCH GRANTS

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

**CSCR19IRG007**

**Steven Zheng, Ph.D.**

**Rutgers University Biomedical and Health Sciences**

**Cancer Institute of New Jersey - \$600,000**

***Project Title: Role of MAF1 in the Neuroprotection and Axonal Regeneration after Spinal Cord Injury***

This project will investigate the negative role of MAF1 in the growth and survival of spinal neurons, and explore MAF1 as a potential therapeutic target for treatment of spinal cord injury.

There are as many as 17,500 new spinal cord injury (SCI) cases nationwide and over 300 in New Jersey each year. SCI has long-term debilitating effects on the injured individuals, and heavy burden on their families and the health care system. Currently, no effective treatment is available. There is an urgent need for new therapies.

A major challenge for recovery from SCI is to regain the growth ability of adult spinal nerves, which is lost due to restrained activity of mTOR, a master regulator of axonal growth. Recent studies have shown that stimulating mTOR by deletion of PTEN leads to regeneration of brain and spinal nerves. Unfortunately, removing PTEN is known to cause cancers in mice and men. Therefore, it is important to find new targets to activate mTOR without severe adverse effects.

In our preliminary study, we discovered that knockdown of MAF1 promotes the growth and survival of brain neurons. Maf1 inhibition does not appear to have the negative consequences suffered from PTEN blockage. In this application, we will study MAF1 in spinal neurons and test whether Maf1 inhibition has also stimulate the regeneration and survival of spinal neurons. If successful, the proposed studies will help lay groundwork for developing novel therapeutic drugs for treating SCI.

**Contact Information:**

Steven Zheng, Ph.D.

Rutgers University BHS

Cancer Institute of New Jersey

195 Little Albany Street

New Brunswick, NJ 08901

732-235-6879

[zhengst@cinj.rutgers.edu](mailto:zhengst@cinj.rutgers.edu)



## 2019 RESEARCH GRANT AWARDS - EXPLORATORY RESEARCH GRANT RECIPIENTS

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

**CSCR19ERG004**

**Martin L. Yarmush, M.D., Ph.D.**

**Rutgers University Biomedical and Health Sciences**

**Cancer Institute of New Jersey - \$200,000**

**Project Title: *Autonomous Early Detection and Treatment of Pressure Wound after Spinal Cord Injury***

We will monitor galvanic skin responses, recorded differentially from normal and pressure wounded skin to detect invisible onset of pressure ulcers and guide healing using electrical stimulation.

Pressure ulcers, with an incidence of over 50%, are serious secondary complications in spinal cord injury patients. The loss of sensation and mobility makes SCI patients very prone to develop pressure ulcers that rapidly progress to chronic stages where current treatment modalities fail. The chronic pressure ulcers are prone to bacterial infections and sepsis leading to patient death. SCI patients depend on skilled nursing care which currently is expensive and results in delayed treatment due to inadequate pressure ulcer diagnostic tools. The delayed treatment and the absence of options for successful chronic wound treatment makes pressure ulcer treatment a nationwide healthcare priority.

SCI results in a loss of endogenous autoregulatory function of skin necessary to withstand normal pressure. The exposure of skin to the pressure of critical intensity and duration in SCI patients occludes the normal blood circulation depriving cells of oxygen and other nutrients. The changes in subepithelial and interstitial fluid introduced by such deprivation of nutrients along with the local increase in pressure triggers ischemia and necrosis of regional cells and thereby the onset of a pressure ulcer. A mechanism to track and restore such changes can be developed for therapeutic pressure ulcer intervention in SCI patients.

The goal of these studies is to track pressure induced changes on circulation and in interstitial fluid using GSR and restore them using electrical stimulation to develop a clinically relevant multimodal pressure ulcer treatment for SCI patients.

**Contact Information:**

Martin L. Yarmush, M.D., Ph.D.

Rutgers University BHS

Cancer Institute of New Jersey

599 Taylor Road, Suite 231

Piscataway, NJ 08854

848-445-6528

[yarmush@rci.rutgers.edu](mailto:yarmush@rci.rutgers.edu)

## 2019 RESEARCH GRANT AWARDS - EXPLORATORY RESEARCH GRANT RECIPIENTS

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

**CSCR19ERG008**

**Treana Arinzeh, Ph.D.**

**New Jersey Institute of Technology - \$200,000**

***Project Title: A Novel Combination Strategy Using Schwann Cells and a Bifunctional Conduit for Spinal Cord Repair***

This study will evaluate the use of a bifunctional conduit that provides both physical and biochemical cues in combination with Schwann cells for spinal cord repair. In the United States alone, there are approximately 300,000 individuals living with a spinal cord injury (SCI). SCI is a devastating condition for which there is no cure. Bioengineering efforts have been focused on developing biomaterials that promote the regeneration of axons across lesions. Although these materials show promise, the overall effect is limited, and many axons fail to traverse the lesion. In addition, directing the axons across the lesion back into the spinal cord to integrate with host pathways remains to be achieved. Recent efforts, therefore, have been exploring combination strategies using conduits with cells and/or neurotrophic or neuroprotective factors.

The goal here is to improve axon regeneration across a Schwann cell (SC)-containing conduit and into the host cord to improve functional recovery by using a novel tissue engineering strategy. These studies bring together the PI, Dr. Treana Livingston Arinzeh, who has expertise in tissue engineering and biomaterials, with an established investigator in SCI research, Dr. Martin Oudega, to develop a novel, combination strategy and more translatable approach in spinal cord repair. SCs in combination with a bifunctional conduit that has both physical and biochemical properties will be used in the proposed studies to promote axonal growth. The bifunctional conduit consists of aligned fibers that have piezoelectric activity, which provides electrical activity without having to apply external electrodes, provide contact guidance for directional growth of the axons, and release zinc (Zn) to promote SC survival and axonal regeneration. The conduit is also biodegradable, which allows for full integration over time. The unique combination of SC transplantation with a degradable piezoelectric conduit may be an effective and translatable strategy leading to clinical trials. The Miami Project, where Dr. Martin Oudega is a Research Associate Professor, is currently conducting autologous human SC transplantation for human SCI. Studies proposed here will complement the ongoing clinical trial by developing novel SC combination strategies to improve functional recovery. If findings in the proposed animal studies show promise, the path to a clinical trial will be faster since SCs are currently in a clinical trial and the proposed biomaterials also are approved by the FDA.

## 2019 RESEARCH GRANT AWARDS - EXPLORATORY RESEARCH GRANT RECIPIENTS

**Contact Information:**

Treena Arinzeh, Ph.D.  
New Jersey Institute of Technology  
University Heights  
Fenster Hall, Room 618  
Newark, NJ 07102  
973-596-5269  
[arinzeh@njit.edu](mailto:arinzeh@njit.edu)

## 2019 RESEARCH GRANT AWARDS - FELLOWSHIP RESEARCH GRANT RECIPIENTS

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

**CSCR19FEL002**

**Nofar Engelhard**

**Rutgers University - \$60,000**

***Project Title: Characterizing a Novel Spinal Cord Population: Role In Both Locomotive Control and Recovery from Spinal Cord Injury***

We target a new spinal cord neuronal population to characterize its connectivity, reveal its role in locomotion, and establish its importance for recovery after spinal cord injury.

Walking requires the synchronization of various muscles, which depends on the orchestrated activity of numerous elements in our spinal cord. Damage to these intricate circuits (spinal cord injury) can result in loss of control over motor functions such as walking (locomotion). The main cause for spinal cord injury is car accidents: in New Jersey alone, there are over 250,000 annual accidents - of which 20% result in injuries. Although no treatment can restore one's ability to walk, rehabilitation strategies show some success in improving motor function, suggesting that providing stimulation to the spinal cord cause the induction of neural circuits change, serving as the mechanism of the improved motor control. This capability of neural circuits to change their connection pattern and to reorganize to form new circuits, is broadly termed - plasticity. Indeed, animal research supports the notion that spinal cord is capable of spontaneous plastic reorganizations after spinal cord injury; processes that can be further engaged by rehabilitation.

Thus, to develop better therapies for restoration of motor control after spinal cord injury, we must identify and characterize the spinal cord elements participating in plasticity - induced recovery of motor function. Circuits involved, are suggested to possess some or all of the following properties: they 1) are modulated by external information about touch, body posture, and position, 2) have the ability to directly contribute to movement, and 3) have a role in synchronizing activity across the body. Identifying these circuits will allow for a better understanding of the plasticity processes that underlie functional recovery following spinal cord injury; knowledge that can be used for optimization of therapeutic approaches.

We use advanced mouse genetic tools, allowing us to both visualize, and manipulate specific spinal cord neuronal populations. Combined with our sensitive behavioral paradigms, we can characterize their connections within the spinal cord, and identify their role in locomotion, in both the healthy and injured animal. Our preliminary work identifies a new spinal cord neuronal population, termed IZ-PV+. Our results suggest that a spinal cord IZ-PV+ microcircuit exhibits all the major characteristics of circuits participating in plasticity- induced functional recovery and

## 2019 RESEARCH GRANT AWARDS - FELLOWSHIP RESEARCH GRANT RECIPIENTS

is thus, likely to be important in both locomotive control and recovery from spinal cord injury. We propose to thoroughly characterize the circuit in which IZ-PV+ neurons reside, their projection patterns across the spinal cord and their role in locomotion of the healthy animal. This proposal will set the groundwork for our future work, in which we will examine IZ-PV+ contribution to locomotion and recovery from spinal cord injury. We argue: to better understand how specific spinal cord neuronal populations reorganize after injury to improve recovery, we must first characterize them in the healthy animal. We hope that research such as ours will open the door for similar work, designed to characterize additional spinal cord circuits in health and disease. Expanding our knowledge about specific spinal cord subpopulations will supply an arsenal of potential therapeutic targets, with different potential clinical advantages that could be used for personalized treatment of spinal cord injury.

**Contact Information:**

Nofar Engelhard  
Rutgers University  
Dept. Cell Biology & Neuroscience  
604 Allison Road  
Piscataway, NJ 08854  
609-516-3813  
[nofar.engelhard@rutgers.edu](mailto:nofar.engelhard@rutgers.edu)

## 2019 RESEARCH GRANT AWARDS - SPINAL CORD TECHNIQUES TRAINING TRAVEL GRANT RECIPIENTS

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

**CSCR19TTT002**

**Nofar Engelhard**

**Rutgers University - \$4,000**

After finishing high school, I chose to devote two years for national service in my home country, Israel. During that time, I volunteered in an organization for adults and youths with various types of disabilities, including paraplegia and quadriplegia. We, as a group of volunteers, came there to spend time with them, take part in their activities, and help them with whatever was necessary. While I already knew that I wanted to study biology, this experience made me develop a specific interest in understanding the biology of disabilities and in studying ways to improve them.

Since then, my research training has focused on dissection of specific neuronal circuits important for sensorimotor integration. Additionally, I gathered various expertise including: patch clamp electrophysiology, immunohistochemistry and behavior. I am currently during my second year of a PhD program in the lab of Dr. Victoria Abaira at Rutgers University where we are interested in studying the role of specific spinal cord circuits in sensorimotor function. To that end, our lab developed and validated the use of advanced mouse molecular genetic tool box to label, visualize and manipulate specific spinal cord circuits. It is my personal interest, which I share with my PI, Dr. Victoria Abaira, to extend our expertise to the field of spinal cord injury.

Our tools, used for genetic targeting of specific spinal cord circuits, present a great opportunity to dissect the role of specific spinal cord populations in recovery from spinal cord injury. This research is both conceptually and technically innovative and can have a profound impact of clinical approaches targeting specific spinal cord circuits to induce recovery from spinal cord injury. To achieve my goal, I would like to participate in a spinal cord technique course. Support from the New Jersey Commission on Spinal Cord Research will guarantee the necessary training to allow me to apply my unique skills (including mouse molecular genetics, spinal cord electrophysiology, anatomy, and behavior) to shed light on the circuits involved in recovery from spinal cord injury.

#### **Contact Information:**

Nofar Engelhard  
Rutgers University  
Dept. Cell Biology & Neuroscience  
604 Allison Road  
Piscataway, NJ 08854  
609-516-3813  
[nofar.engelhard@rutgers.edu](mailto:nofar.engelhard@rutgers.edu)



## 2019 RESEARCH GRANT AWARDS - SPINAL CORD TECHNIQUES TRAINING TRAVEL GRANT RECIPIENTS

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

**CSCR19TTT003**

**Diego Prado De Maio**

**Rutgers University - \$4,000**

I am very interested in training in the area of neuroimmunology, a rapidly expanding field that shows significant promise. I believe spinal cord injury research is one area in particular that could greatly benefit from the application of immunology science, and I would like to gain the knowledge and skills necessary to carry this out. This course will provide me with in depth knowledge of techniques so that I will improve my surgical skills and create more repeatable data efficiently.

In this regard, I am currently working with a mouse model of decreased helper T cell immunity to determine the role of these cells in systemic lupus erythematosus and neurotrauma following a spinal cord injury. With this fellowship, I would be able to expand my current research and focus on the relationship between spinal cord injury and autoimmunity. My sponsor and I have established a plan based on current literature to investigate this actively developing area, including attending the Spinal Cord Injury Techniques Training Program at Ohio State University.

#### **Contact Information:**

Diego Prado De Maio

Rutgers University

Dept. Cell Biology & Neuroscience

604 Allison Road

B318 Nelson

Piscataway, NJ 08854

[djp229@gsbs.rutgers.edu](mailto:djp229@gsbs.rutgers.edu)

## 2019 RESEARCH GRANT AWARDS - SPINAL CORD TECHNIQUES TRAINING TRAVEL GRANT RECIPIENTS

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

**CSCR19TTT004**

**Nisha Singh**

**Rutgers University - \$4,000**

As an aspiring biomedical researcher, I am interested in elucidating the molecular mechanisms underlying the secondary phase of spinal cord injury (SCI) to aid in the development of drugs and other pharmaceutical agents that can be used for treatment. In particular, identifying therapeutic targets in relevant molecular pathways, developing and optimizing modes of treatment delivery, and studying axon kinematics and pharmacokinetics, are areas that I would like to pursue. The SCI techniques training course will equip me with additional knowledge and experience that can be applied to more effectively explore these avenues of research.

Through the course, I hope to learn more about current in vivo approaches that are being used to study SCI. The course will give me a better understanding of these methodologies, their implementation, and the experimental designs associated with them. Applying these approaches to my research in conjunction with in vitro experiments will facilitate more comprehensive testing of pharmacologic agents that I identify as viable treatment options and characterizations of SCI pathology.

#### **Contact Information:**

Nisha Singh

Rutgers University

Dept. Cell Biology & Neuroscience

604 Allison Road

Piscataway, NJ 08854

848-445-8046

[nks76@gsbs.rutgers.edu](mailto:nks76@gsbs.rutgers.edu)

# 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.

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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.

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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.