

# **NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH**



## **2009 ANNUAL REPORT**

**JANUARY 29, 2010**





## **MEMBERS OF THE NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH - 2009**

### **2009 COMMISSION MEMBERS**

**Susan P. Howley, Chairperson**  
**Cynthia M. Kirchner, M.P.H, Vice-Chair**  
**Peter W. Carmel, M.D.**  
**Robin L. Davis, Ph.D.**  
**John D. Del Colle**

### **ACKNOWLEDGEMENTS**

The NJCSCR would like to express its sincere appreciation to all present and past Commission members, and the New Jersey Department of Health and Senior Services for their expertise, time, and effort.

The NJCSCR also wishes to thank Katherine Hempstead, Director, Office of Injury Surveillance and Prevention, Center for Health Statistics, for the spinal cord injury surveillance statistics, Executive Director Gabriel B. Milton, and Commission staff members Christine Traynor and Mary Ray for their support.

This report is being submitted in fulfillment of the legislative mandate in the N.J.S.A. 52:9E-4(f). The report describes the implementation of the Spinal Cord Research Act and evaluates the benefit of the Act as evidenced in this report of grant awards for State Fiscal Year 2009.

### **ADMINISTRATIVE STAFF**

**Gabriel B. Milton, J.D., L.L.M., Executive Director**  
**Christine Traynor, Administrator**  
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## STATE OF NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH

January 29, 2010

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

Dear Governor Christie:

On behalf of the New Jersey Commission on Spinal Cord Research (NJCSCR), its members, staff and the spinal cord injured citizens of New Jersey, it is my privilege to present the Annual Report for Fiscal Year 2009, pursuant to N.J.S.A. 52:9E-4(f).

In 2009, the NJCSCR awarded \$2.3 million, funding five Individual Research grants totaling \$1.7 million and four Fellowships totaling \$280,000. These projects were carefully selected by a panel of independent scientific experts from thirty-eight applications submitted by researchers at New Jersey academic institutions, and approved by vote of the NJCSCR.

The NJCSCR grants often produce the basic research findings necessary to compete successfully for larger NIH and other grants, and help attract talented scientists and students to this exciting and promising field. Each of the funded projects has the potential to contribute significantly to the development of treatments and cures for the paralysis and complications that accompany spinal cord injury.

The NJCSCR is supported exclusively by a surcharge on traffic violations and does not draw upon general tax revenue. Its spinal cord research programs bring value-added to New Jersey's impressive scientific portfolio and help to insure that the State remains at the forefront of neuroscience.

We wish to thank you, the Department of Health and Senior Services, and the State of New Jersey for your continued support and advocacy of spinal cord injury research.

Respectfully,

A handwritten signature in blue ink that reads "Susan P. Howley". The signature is fluid and cursive, with the first name being the most prominent.

Susan P. Howley  
Chairperson



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**New Jersey Commission On Spinal Cord Research**

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## EXECUTIVE SUMMARY

**The New Jersey Commission on Spinal Cord Research (NJCSCR), established in 1999, funds spinal cord injury research projects in New Jersey.**

- ❖ Since 2001, the New Jersey Commission on Spinal Cord Research has awarded over \$28.1 million to 102 individual scientists at six academic and research institutions, and approved 132 separate scientific research projects.
  - Since 2001, 80 NJCSCR research projects have been completed.
  - Over 80 scientific articles reporting on work funded by NJCSCR have appeared in peer-reviewed scientific publications or are in preparation.
  - Progress made by NJCSCR researchers has been presented in abstracts, scientific conferences, symposia, and meetings.
  - NJCSCR programs have enabled wider scientific interaction and research collaborations, many with out-of-state researchers.
  - Success in achieving NJCSCR funding has resulted in academic and career advancement for New Jersey researchers, including doctoral dissertations.
  - Over 50 applications to NIH, NSF and other organizations based on NJCSCR grants have been made. NJCSCR programs have enabled wider scientific interaction and at least 16 active research collaborations.
- ❖ NJCSCR offered two grant programs in SFY2009:
  - Individual Research Grants.
  - Postdoctoral and Graduate Fellowship Grants.
- ❖ NJCSCR 2009 Achievements:
  - Thirty-eight applications requesting \$9.4 million were submitted from six institutions.
  - Nine awards were made in 2009 totaling \$2.0 million.
  - Five Individual Research Grants totaling \$1.7 million and four Fellowships totaling \$280,000 were approved.
  - Empanelled an expert Strategic Advisory Board that met with the NJCSCR to identify new opportunities and initiatives to expand the impact and significance of its programs.
  - Commission outreach efforts continued through attendance and participation in conferences, workshops and symposia.

### **NJ Spinal Cord Registry:**

- ❖ NJCSCR supports a central registry of spinal cord injured persons in New Jersey in cooperation with New Jersey Department of Health and Senior Services Center for Health Statistics
- ❖ The database provides resource for research, evaluation, and information on spinal cord injuries
- ❖ All Level 1 trauma centers now collect and submit comprehensive data electronically and soon an on-line system will allow all New Jersey acute care facilities to participate.
- ❖ Over the period 2006-2008, there have been 1,064 hospitalizations for spinal cord injury in New Jersey, with an overall incidence of 3.9 cases per 100,000 population.



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**New Jersey Commission On Spinal Cord Research**

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## INTRODUCTION



**"...an ailment not to be treated..."**

- William Smith Surgical Papyri - circa 2500 BC

Spinal cord injury and paralysis has long been regarded as a virtually hopeless diagnosis with a grim prognosis. Only since World War II has the outlook brightened. New approaches to rehabilitation and modern medicines have extended life expectancy from mere months to years and even decades.

Many people with permanent injury now look forward to far more vital and productive lives. More recently, breakthroughs in research and new horizons in the life sciences are at bringing the prospect of a real cure within sight. This prospect is, however, not yet a reality.

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 spinal cord injury is increasing. Falls, traffic and worksite accidents are the major causes of injuries. Black and Hispanic populations suffer disproportionately.

The economic and human costs of these injuries remain huge. Better therapies are urgently needed and the task of research 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.

### Facts and Figures\*

- ◆ Nearly 35,000 New Jersey residents now live with traumatic spinal cord injury - nationally the number totals 1,275,000.
- ◆ About 1,740 new spinal cord injuries occur annually in New Jersey of the estimated 64,000 across the United States. 300 of these are severe enough to require intensive hospitalization.
- ◆ Spinal cord injury costs New Jersey \$1.1 billion annually, and estimated at \$40.5 billion for the United States.
- ◆ Individual medical costs that can easily exceed tens or even hundreds of thousands of dollars per year - lifetime costs can be in the millions.
- ◆ Indirect costs are hard to quantify, but place a significant burden on individuals and their families, and on state and local resources. The toll in emotional costs and quality of life is incalculable.

\* Source: *One Degree of Separation - Spinal Cord Injury and Paralysis in the United States*. Christopher and Dana Reeve Foundation, 2009



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

**The Spinal Cord Research Act (N.J.S.A. 52:9e-1 et seq.) Created the New Jersey, Commission on Spinal Cord Research and the New Jersey Spinal Cord Research Fund to support its activities.**

New Jersey is a leader in supporting the quest for a cure and repair of spinal cord injuries and paralysis. The New Jersey Commission on Spinal Cord Research, created in 1999 under New Jersey's Spinal Cord Research Act, represents the successful culmination of years of determined effort to enlist New Jersey in the fight.

The NJCSCR provides research grant programs for both established scientists and younger researchers committed to the goals of spinal cord injury research. The Commission also supports the New Jersey Department of Health and Senior Services ("NJDHSS"), Center for Health Statistics ("CHS") in establishing a database of all spinal cord injured patients in New Jersey.

Now in its 10<sup>th</sup> year of operation, the NJCSCR has funded 132 research projects and supported 104 individual scientists at research institutions around the state. Its impartial and scientifically rigorous application and review process has helped make NJCSCR vital to New Jersey's best researchers in their pursuit of answers and cures.

## **THE NEW JERSEY COMMISSION ON SPINAL CORD RESEARCH**

The NJCSCR is one of only nine publicly-funded organizations nationwide that, together with the National Institutes of Health, the Centers for Disease Control, the Veterans' Administration and a few other entities, provide the essential support for the research and learning needed to find the long-sought-for solutions for this devastating and so far incurable injury.

Created as an semi-independent public body, the NJCSCR is "...allocated in, but not of..." the NJDHSS. It is subject to all the administrative rules and procedures of NJDHSS, but is not a part of the Department and is not included in its budget.

The Commission establishes and oversees the operations of the grants process and other activities that are implemented by its administrative staff. Eleven uncompensated Commissioners are appointed by the Governor with the advice and consent of the Senate serve for three-year terms.

Five Commission seats are designated by statute to represent the state's major academic research institutions and stakeholders. Public members provide a diversity of backgrounds and interests united by a shared commitment to the cause of spinal cord research. Any qualified person wishing to be considered for appointment may submit his or her name to the Governor's Office of Appointments. The Commission will always have one or more individual from each of the following institutions and categories:

- ❖ The Commissioner of the NJDHSS, or designee (voting ex-officio member)
- ❖ University of Medicine and Dentistry of New Jersey



## New Jersey Commission On Spinal Cord Research

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- ❖ Rutgers, The State University of New Jersey
- ❖ Spinal Cord Injury Model System (Kessler Foundation Research Center)
- ❖ Christopher and Dana Reeve Foundation (American Paralysis Foundation)
- ❖ Public members (at least one spinal cord physician and a spinal cord injured individual)

The NJCSCR holds public meetings at least four times a year. Two-thirds of sitting members constitutes a quorum for all purposes. Members are recused from discussing or voting on matters in which they may have a potential conflict. A Chair and Vice-Chairperson are elected annually and preside over all formal proceedings.

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

## ADMINISTRATION

The NJCSCR's administrative office provides the vital linkages and machinery that implement the NJCSCR's programs and ensure the integrity of its operations. The Executive Director and office staff manage the NJCSCR's day-to-day operations, including program administration, interaction with applicants and grantees, contract administration, budgeting and financial matters, record-keeping and reporting.

The office schedules and facilitates all NJCSCR activities, manages the scientific merit review process, negotiates with outside vendors, and maintains the necessary relationships within state government.

The Executive Director, through outreach and other activities on behalf of NJCSCR, serves as its main spokesperson and liaison with NJDHSS, other state entities, outside institutions and third parties. The Executive Director is also responsible for monitoring, measuring, and reporting on NJCSCR performance and activities.

## NEW JERSEY SPINAL CORD RESEARCH FUND

The work of the NJCSCR is supported entirely by a statutory one dollar surcharge on all traffic and motor vehicle fines or penalties. Similar sources of funding have been implemented successfully by several other jurisdictions - vehicular accidents are a significant cause of spinal cord injury.

Revenue is collected by the State Treasurer for deposit into the New Jersey Spinal Cord Research Fund. The NJCSCR funds all its grant programs and other activities entirely from this dedicated source. No part of the NJCSCR's operating budget is paid for out of New Jersey's general tax revenue.



## **MISSION AND GOALS**

The New Jersey Commission on Spinal Cord Research implements the commitment of New Jersey to the international quest for cures for catastrophic spinal cord injuries. Through its grants programs and related activities, the NJCSCR reinforces New Jersey's preeminence as a center of biomedical research and a leader in neuroscience, neurotrauma, and spinal cord research.

- ❖ The NJCSCR supports meritorious research projects that advance the understanding of spinal cord injury and explore potential therapeutic strategies
- ❖ The NJCSCR supports the progression of research from laboratory to animal and clinical applications.
- ❖ The NJCSCR programs enhance the reputation of the New Jersey as a focus of research and increases its attractiveness to researchers and business.

## **OBJECTIVES**

The NJCSCR seeks to accelerate research that will deepen our understanding of spinal cord injury and open the way to interventions and cures for paralysis and associated conditions. The NJCSCR has identified the following objectives:

- ❖ 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.
- ❖ Promote dissemination of the research findings generated by scientists supported by the NJCSCR.





## RESEARCH FUNDING PRIORITIES

The **NJCSCR Research Guidelines** set forth the Commission's scientific agenda, research criteria and areas of particular interest. They offer applicants detailed guidance and instruction on funding criteria and policies. The full text appears on the NJCSCR website. [www.state.nj.us/health/spinalcord](http://www.state.nj.us/health/spinalcord).

NJCSCR currently offers an array of grant programs including individual research grants, fellowships, and exploratory research grants. Each of these programs is designed to support and encourage spinal cord research in New Jersey in a unique way. The NJCSCR is continually evaluating its programs and seeking ways to improve performance and results.

### The NJCSCR Research Guidelines

New Jersey Commission on Spinal Cord Research will fund research activities that hold promise of developing effective interventions and cures for paralysis and other consequences of spinal cord injury and disease. The areas of research listed below highlight the focus of current NJCSCR emphasis and funding:

- ◆ Studying 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.
- ◆ Evaluating efficacy of drugs and other interventions that prevent or reduce secondary neuronal injury or providing insight into the mechanisms causing progressive damage.
- ◆ Defining 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.
- ◆ Elucidating 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.
- ◆ Developing strategies to prevent or treat secondary complications arising from injury or disease to the spinal cord.
- ◆ Developing innovative restorative rehabilitation strategies to promote recovery of biological function.
- ◆ Translating basic and pre-clinical findings into clinical application.
- ◆ Supporting the investigation of promising new approaches.

## OTHER ACTIVITIES

The NJCSCR is engaged in activities that promote awareness and interest in spinal cord injury and opportunities for research.

NJCSCR supports the efforts of NJDHSS' Center for Health Statistics under a Memorandum of Agreement to establish a "*Spinal Cord Injury Registry*" - a centralized data base of a standardized data set collected and submitted by each treating hospital on each new case of spinal cord injury in New Jersey.

Such a registry is mandated by statute as a resource for research, evaluation, and information on spinal cord injuries. CHS provides an annual report on spinal cord injury in the state as well as periodic updates to the NJCSCR.



## THE NJCSCR APPLICATION AND REVIEW PROCESS

The NJCSCR grants review process was designed to emulate NIH standards and procedures to provide an impartial and rigorous review. This effort has been largely successful and has earned respect from grantees and applicants. The NJCSCR application process is now entirely electronic utilizing the *proposalCENTRAL* grants management system, and is accessible through the NJCSCR website.

The on-line process ensures broad access, convenience and flexibility, and greatly reduces administrative workloads for applicants, the NJCSCR office, and the Scientific Merit Review Panel.

The NJCSCR administrative staff reviews all applications for completeness and accuracy and assists applicants in correcting errors or omissions.

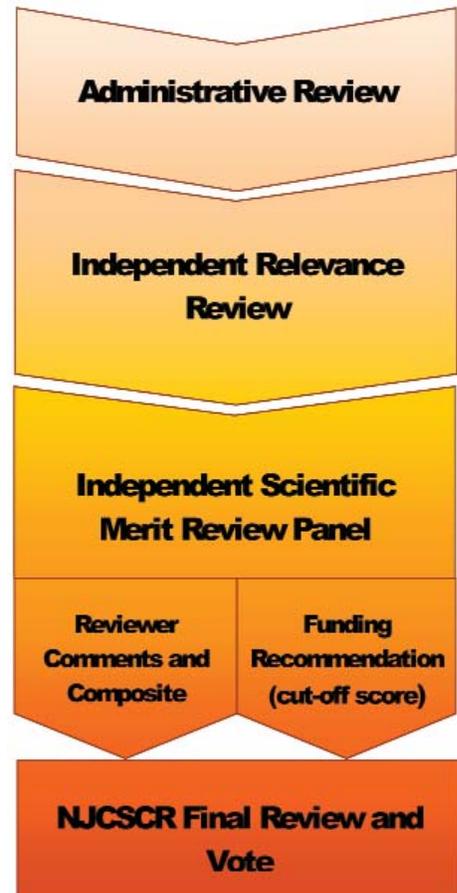
Relevance to the overall goals of the NJCSCR is assessed by an expert panel who also recommend reviewers for each grant from a pool of over 100 highly qualified scientists.

Each application is reviewed and scored independently by two or three peers prior to discussion at the Scientific Merit Review Panel meeting ("triated" applications are not discussed or scored.)

The remaining applications are fully discussed and scored by the entire panel and given a composite score. The panel also suggests a cut-off point for funding. The scores, comments, and funding recommendations are delivered to the NJCSCR for final consideration and vote.

The NJCSCR makes the final decision whether to fund each application by majority vote. The Commissioners pay close attention to the results of the Independent Scientific Merit Review, but retain discretion to take other factors into consideration in judging the merit of each application. Any application that was scored and not funded may be resubmitted with appropriate changes within 30 days for inclusion in the next grants cycle.

All applicants, regardless of the decision, receive "blinded" reviewer comments. These are often valuable and may help a researcher rethink a project or reframe a future application.





## CURRENT GRANTS PROGRAMS

NJCSCR grant programs are designed to provide opportunities attractive to a wide range of researchers. The Individual Research Grant is designed to fund senior independent researchers, while Fellowships offer encouragement to graduate students and post-doctoral researchers.

New in 2010 will be the Exploratory Research Grant, which provides a two-year non-renewable grant of up to \$200,000 to enable independent investigators to apply innovative ideas from other areas of science to spinal cord injury and repair. These grants are intended to enable the acquisition of preliminary data needed to successfully apply for larger grants from the NJCSCR, National Institutes of Health, and elsewhere. Inter-institutional and/or inter-state collaboration is strongly encouraged. Complete details on all NJCSCR programs are available on-line.

Larger, longer-term grants offered in the past have been discontinued for 2009.

### 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)
- ❖ Key goal is to enable established researchers to test and develop pilot data needed for future funding.

### Fellowship 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.
- ❖ Post-doctoral 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

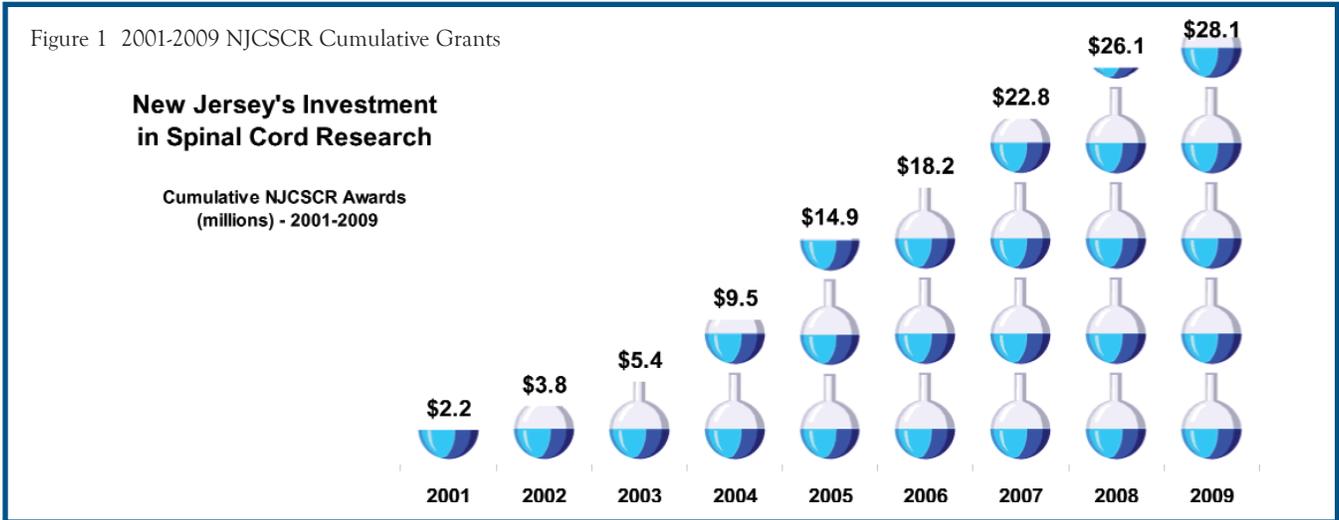


- ❖ Enable independent investigators to apply their specific expertise to spinal cord research.
- ❖ Develop preliminary data needed to justify higher levels of funding.
- ❖ Apply innovative ideas from other areas to spinal cord research.
- ❖ Encourage inter-institutional and/or inter-state collaborations.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



# 2001-2009 NJCSCR SUMMARY AND PERFORMANCE RECORD

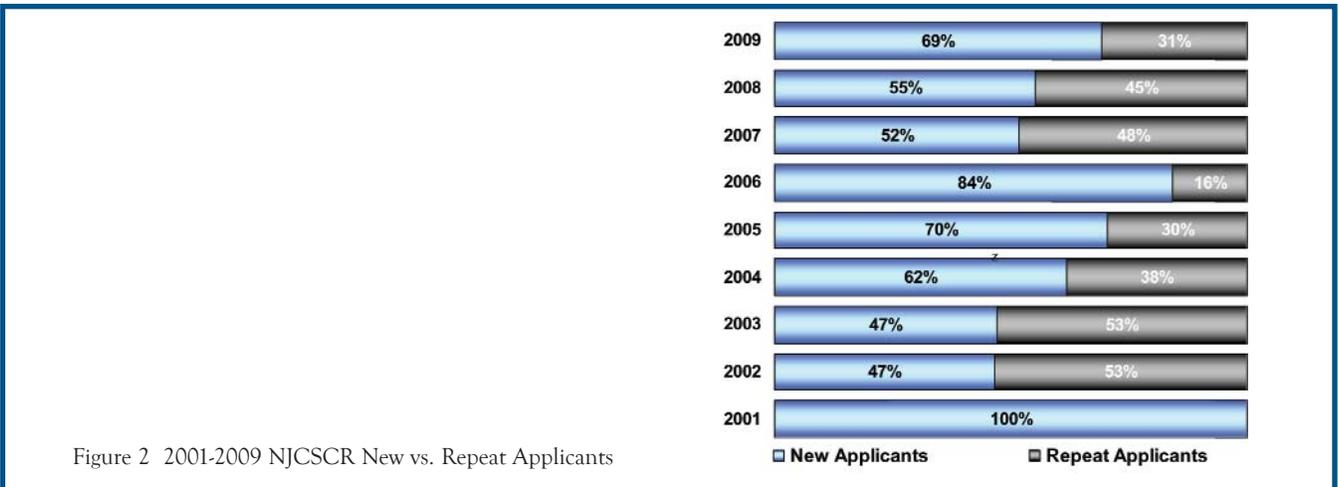
Since 2001, the New Jersey Commission on Spinal Cord Research has funded 132 separate scientific research projects to 97 individual scientists at six academic and research institutions. These awards represent an investment in spinal cord injury research of \$28.1 million (see Figure 1.)



NJCSCR receives over 50 applications annually, approving 20 or more new awards, totaling between \$2.5 and \$3.5 million.

As NJCSCR continues to invest in spinal cord research, the number of New Jersey researchers interested in the field is growing. The NJCSCR has been successful in attracting large numbers of new applicants to its programs every year.

First-time applicants represent a significant majority of applications received by the NJCSCR each year. These applications are an indication of the continued interest generated by the NJCSCR in participating in spinal cord research. See Figure 2.





## GRANT APPLICATIONS

NJCSCR has received 390 applications from 215 professors, post-doctoral fellows, and graduate students at 14 New Jersey research institutions. Table 1 provides data on current and cumulative applications, which now exceed \$103.9 million in grant requests.

<i>Program</i>	<i>FY '01 - '05</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>Total</i>
<b><i>Applications</i></b>						
Individual Research	144	31	37	27	22	261
Fellowship	22	29	21	20	16	108
One-Time Start-up	2	3	3	4		12
5-Yr. Named Chair	4	2	1	2		9
All Applications	172	65	62	53	38	390
<b><i>Funds Requested</i></b>						
Individual Research	\$37.4	\$10.9	\$12.8	\$9.2	\$8.2	\$78.5
Fellowship	\$1.5	\$1.9	\$1.4	\$1.4	\$1.2	\$7.5
One-Time Start-up	\$1.7	\$2.3	\$2.6	\$3.0		\$9.5
5-Yr. Named Chair	\$4.1	\$1.3	\$1.0	\$2.0		\$8.4
All Applications	\$44.7	\$16.4	\$17.8	\$15.6	\$9.4	\$103.9

Table 1 2001-2009 NJCSCR Applications by Program

The NJCSCR has explored a range of grant programs that provide opportunities for both very senior and younger researchers, and larger programs for establishing new spinal cord research facilities and support for professorships (these latter two are not currently offered.)

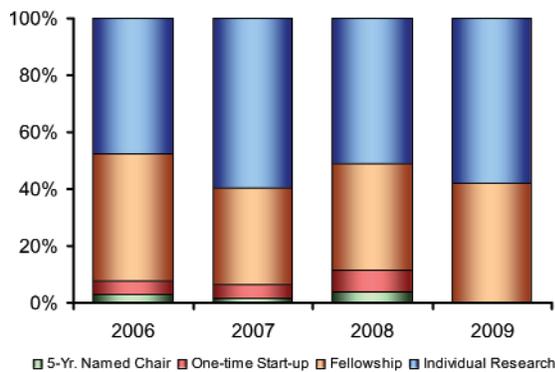


Figure 3 2001-2009 Percent NJCSCR Applications by Program Type

Applications for Individual Research Grants typically account for about two-thirds of the total. Interest in both Fellowship and Individual Research programs is historically strong. (Note: NJCSCR offered only a single grant cycle in 2009, which limited the number of applications received.) See Figure 3.

Fellowships offer the advantage of engaging the greatest number of scientists in spinal cord research for the least cost. Fellowship applications have been funded at a high rate, nearly 43%. Just under one-third of all Individual Research Grant applications are approved. This is in contrast to much lower rates of approval for the NJCSCR's larger, more complex programs.



## GRANT FUNDING

NJCSCR has an overall funding rate of 33.8%. This rate is consistent with its goals of advancing spinal cord research, encouraging New Jersey scientists to get involved in the field, and funding the exploratory and pilot research often needed to obtain larger grants from sources such as National Institutes of Health ("NIH") and the National Science Foundation (See Table 2 below.)

<i>Program</i>	<i>Applications</i>	<i>Grants</i>	<i>Funding Rate</i>
Fellowship	108	45	41.7%
Individual Research	261	84	32.2%
5-Yr. Named Chair	9	2	22.2%
One-Time Start-up	12	1	8.3%
<b>Grand Total</b>	<b>390</b>	<b>132</b>	<b>33.8%</b>

Table 2 2001-2009 NJCSCR Funding Rates by Program

The Commission's funding rate is intentionally designed to be greater than NIH's (for example), as a key goal is to enable researchers develop the data needed to secure larger funding at a national level. Figure 4 shows the funding rate has remained consistent since 2006.

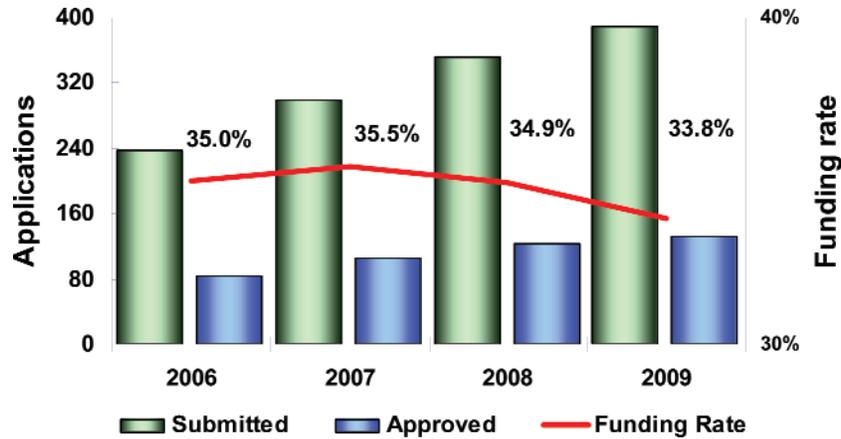


Figure 4 2006-2009 NJCSCR Funding Rates - Applications and Approvals

NJCSCR Individual Research Project 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 NJCSCR is also committed to bringing new researchers and promising students into the field as well. Its programs of graduate and post-doctoral Fellowships have been a success, in both numbers and the quality of applicants.



**New Jersey Commission On Spinal Cord Research**

The Fellowship program is the NJCSCR's most cost-effective initiative, as measured by the number of researchers supported per grant dollar. The Individual Research grants generally support work of greater sophistication and potential importance. Table 3 below shows the number of grants for each type of program and the dollars awarded.

<i>Program</i>	<i>FY '01 - '05</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>Total</i>
<b>Grants Awarded</b>						
Individual Research	52	6	12	9	5	84
Fellowship	12	10	11	8	4	45
5-Yr. Named Chair	2					2
One-Time Start-up		1				1
All Applications	66	17	23	17	9	132
<b>Funds Awarded</b>						
Individual Research	\$12.0	\$2.0	\$3.8	\$2.8	\$1.7	\$22.3
Fellowship	\$0.8	\$0.6	\$0.8	\$0.6	\$0.3	\$3.1
5-Yr. Named Chair	\$2.1					\$2.1
One-Time Start-up		\$0.7				\$0.7
All Applications	\$14.9	\$3.3	\$4.6	\$3.3	\$2.0	\$28.1

Table 3 2001-2008 NJCSCR Awards by Program

**NEW JERSEY QUALIFIED RESEARCH INSTITUTIONS**

Under The Spinal Cord Research Act, NJCSCR funds may only go to researchers affiliated with "*New Jersey Qualified Research Institutions*" ("NJQRIs".)

Five institutions are named in the Spinal Cord Research Act and seven others have been designated by the NJCSCR. These organizations provide a continuing source of interest and applications for NJCSCR funds.

<b>Statutory NJQRIs</b>	<b>NJCSCR Designated NJQRIs</b>
Rutgers, The State University of New Jersey University of Medicine and Dentistry of New Jersey Kessler Foundation Research Center Princeton University Coriell Institute	New Jersey Institute of Technology Veteran's Biomedical Research Institute Stevens Institute Drew University JFK Medical Center, NJ Neuroscience Institute Progenitor Cell Therapy, LLC Seton Hall University Wyeth Research

Table 4 NJCSCR Qualified Research Institutions



## INSTITUTIONAL PERFORMANCE

Interest in NJCSCR programs has been broad-based in both public and private universities and within each institution - over 33 academic departments have applied for funds from 14 New Jersey institutions.

Of the 390 applications received by the NJCSCR thus far, 174 have been submitted by researchers at Rutgers (all campuses) - over 44% of the total - followed by 132 for the UMDNJ system, more than 33% of the total. An additional 84 applications were submitted from 11 other institutions around the state, including Princeton University, Kessler Foundation Research Center and New Jersey Institute of Technology.

The public universities, Rutgers and UMDNJ, have benefited substantially from NJCSCR grants. Winning a combined total of 104 grants and over \$21.7 million dollars in awards, these institutions have become the center of gravity for spinal cord research in the New Jersey.

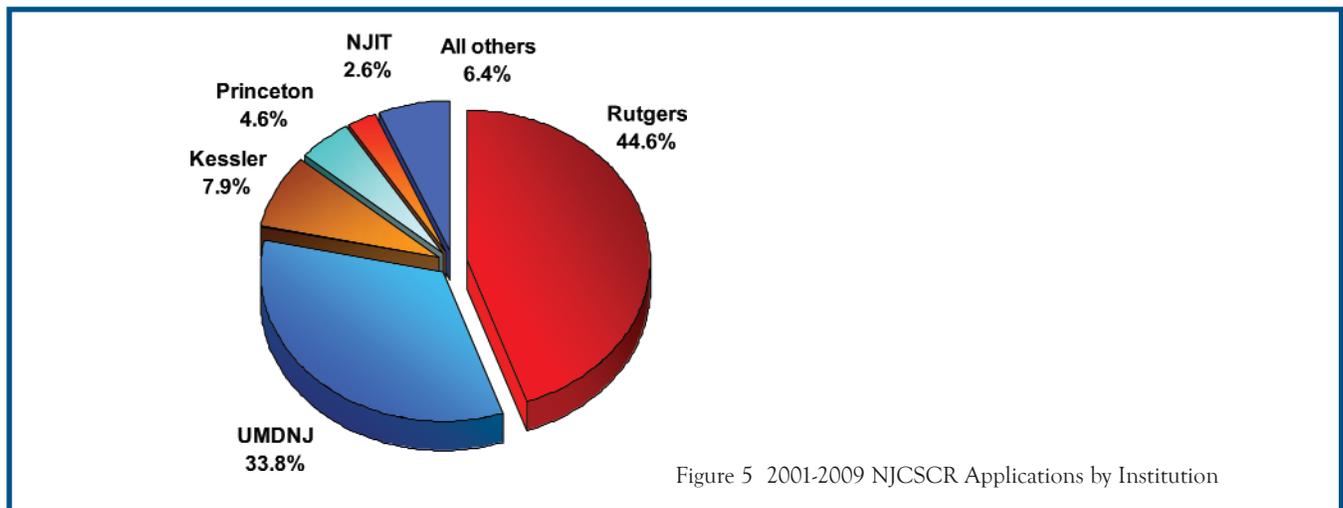


Figure 5 2001-2009 NJCSCR Applications by Institution

Other academic and research institutions have also benefited. A new spinal cord research facility was established at New Jersey Institute of Technology through a grant from NJCSCR. Researchers from Princeton have been successful applicants, with 50% of their proposals approved for funding.

<i>Institution</i>	<i>Grants</i>	<i>Total Awards</i>	<i>Funding Rate</i>	<i>Share of Grants</i>	<i>Share of \$</i>
Rutgers	74	\$14,745,795	42.5%	56.1%	52.4%
UMDNJ	38	\$8,912,431	28.8%	43.7%	31.7%
Princeton	9	\$1,638,024	50.0%	20.0%	5.8%
Kessler	7	\$1,625,292	22.6%	22.6%	5.8%
NJIT	3	\$806,463	30.0%	37.5%	2.9%
Veterans BRI	1	\$393,800	12.5%	5.6%	1.4%
<b>Total</b>	<b>132</b>	<b>\$28,121,805</b>	<b>33.8%</b>	<b>100.0%</b>	<b>100.0%</b>

Table 5 Funding Rate by Institution and Share of Funds Awarded



## RESULTS AND ACHIEVEMENTS

Cure of spinal cord injury remains an elusive and frustrating goal. Years of intensive research and the investment of millions of dollars by NJCSCR and other organizations still leave much work to be done.

NJCSCR grantees and grantee institutions have capitalized on the opportunities afforded by the availability of Commission funding through advancement of individual careers, increased institutional investment, and applying for additional outside funding. The NJCSCR has been a major factor in fostering this interest and continued involvement in spinal cord research within the State of New Jersey.

The NJCSCR continues to pursue its mission, encouraging and supporting spinal cord research in New Jersey. Many of its researchers can point to significant accomplishments.

- ❖ Since 2001, NJCSCR has awarded 132 grants, of which 80 are now completed.
- ❖ Over 80 scientific articles reporting on work funded by NJCSCR have appeared in peer-reviewed scientific publications, and additional articles are in preparation.
- ❖ Progress made by NJCSCR researchers has been presented in numerous abstracts, scientific conferences, symposia, and meetings.
- ❖ NJCSCR programs have enabled wider scientific interaction and research collaborations, many with out-of-state researchers.
- ❖ Success in achieving NJCSCR funding has resulted in academic and career advancement for New Jersey researchers, including doctoral dissertations.
- ❖ Over 50 applications to NIH, NSF and other organizations have been submitted, based in part on work funded by NJCSCR grants

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





## 2009 NJCSCR YEAR IN REVIEW

### 2009 NJCSCR SPINAL CORD RESEARCH GRANTS PROGRAM

The NJCSCR awarded nine applicants a total of two million dollars in 2009. Five Individual Research grants and four Fellowships were funded after a careful review of the 38 applications submitted. The NJCSCR awarded the maximum amount reserved.

The NJCSCR authorized one grant cycle for the SFY 2010 offering Individual Research Grants and Fellowship Grants. Announced in May 2008, the NJCSCR reserved up to six million dollars for spinal cord research projects. Neither the Five-Year Named Professorship nor One-Time Start-up Costs grants were available in 2009. Announced grant

### 2009 APPLICATIONS

2009 saw the New Jersey Commission on Spinal Cord Research in its tenth year of operation and its thirteenth cycle of grants. Thirty-eight applications were submitted from five institutions. Total funds requested exceeded \$9.4 million.

<i>Type</i>	<i>Applications</i>	<i>% of #</i>	<i>Request</i>	<i>% of Funds</i>
Individual Research	22	58%	<b>\$8,162,004</b>	87%
Fellowship	16	42%	<b>\$1,240,000</b>	13%
<b>Grand Total</b>	<b>38</b>	<b>100%</b>	<b>\$9,402,004</b>	<b>100%</b>

Table 6 2009 NJCSCR Grant Program Applications

16 Fellowship applications and 22 Individual Research applications were submitted by researchers at 11 departments at six institutions. Rutgers and UMDNJ-RWJMS accounted for most of these - 17 and 14 respectively.

<b>Rutgers, The State University</b>	<b>17</b>	<b>UMDNJ-NJMS</b>	<b>1</b>
Biomedical Engineering	7	NJ Medical School	1
W.M. Keck Ctr for Collaborative Neuroscience	6		
Genetics	1		
Molecular Biology & Biochemistry	1	<b>UMDNJ-RWJMS</b>	<b>14</b>
Cell Biology & Neuroscience	1	Robt. Wood Johnson Medical School	11
Chemistry & Chemical Biology	1	Neuroscience and Cell Biology	1
		Pathology and Laboratory Medicine	1
<b>Kessler Foundation Research Center</b>	<b>2</b>	Pediatrics	1
<b>NJIT</b>	<b>1</b>	<b>Veterans Biomedical Research Inst.</b>	<b>1</b>

Table 7 2009 NJCSCR Grant Applications by Institution and Departments



## 2009 FUNDING

The NJCSCR voted to fund nine new and one continuing applications, awarding \$2.0 million. Five Individual Research grants were approved for over \$1.7 million and four Fellowships were awarded totaling \$280,000.

NJCSCR funded 23.7% of all applications submitted in 2009 - 25% of Fellowships and 22.7% of Individual Research applications, continuing NJCSCR's support for graduate and post-doctoral students, as well as independent individual researchers.

Type	Grants	% of Grants	Award	% of Funds
Fellowship	4	44.4%	\$280,000	14.0%
Individual Research	5	55.6%	\$1,720,000	86.0%
Grand Total	9	100.0%	\$2,000,000	100.0%

Table 8 2009 NJCSCR Grant Awards by Program

## 2009 RESULTS BY INSTITUTION

The NJCSCR approved four applications from Rutgers researchers, four for UMDNJ-RWJMS, and one for NJIT. Researchers at Rutgers will receive disbursements of over \$1.2 million, UMDNJ researchers over \$722,000, and New Jersey Institute of Technology \$60,000.

Institution	Individual Research		Fellowships		Total	
	Grants	Award	Grants	Award	Grants	Award
Rutgers	3	\$1,157,721	1	\$60,000	4	\$1,217,721
UMDNJ-RWJMS	2	\$562,279	2	\$160,000	4	\$722,279
NJIT			1	\$60,000	1	\$60,000
Grand Total	5	\$1,720,000	4	\$280,000	9	\$2,000,000

Table 9 2009 NJCSCR Grant Program Awards by Institution

Rutgers received 60% of the Individual Research grants and 40% went to UMDNJ-RWJMS. Rutgers and NJIT each took 25% of the Fellowship awards and UMDNJ-RWJMS 50%. (See Figure 6 below.)

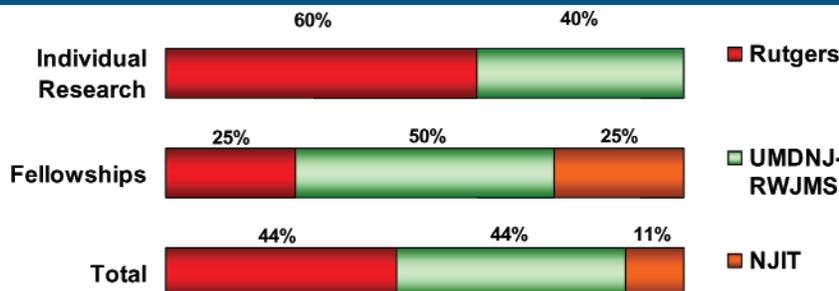


Figure 6 2009 NJCSCR Grants Awards by Institution



## **2009 OUTREACH AND DEVELOPMENT EFFORTS**

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

### **Publication of Grant Programs**

Official Notices of Grant Availability advise interested parties of NJCSCR grant programs. These are published in the New Jersey Register and the NJDHSS' Directory of Grant Programs and advertised in leading scientific journals.

### **Strategic Advisory Board**

On September 29, 2008, the New Jersey Commission on Spinal Cord Research (NJCSCR) held an all-day workshop with a panel of eminent spinal cord researchers. The aim was identify new opportunities and initiatives available to the NJCSCR that would build on its record of success and expand the impact and significance of its programs.

A broad range of programs and institutions took part, including Yale University, Georgetown University, University of Louisville, University of Washington, Stony Brook University (SUNY), and The Beckman Institute, and deans and vice-presidents of research from New Jersey research and academic institutions including Rutgers, Princeton, Robert Wood Johnson Medical School (UMDNJ), New Jersey Medical School (UMDNJ), the Kessler Foundation and NJIT. The entire Commission membership and staff was present.

The NJCSCR is considering the learning gathered from this extraordinary and thought-provoking event and has already incorporated many of these ideas in revitalized programs and new relationships with the state's academic institutions. These include:

- ❖ Increase the size and duration of Individual Research Grants, making them more attractive to senior, well-established researchers.
- ❖ Dramatically increase outreach efforts, specifically targeting senior researchers in disciplines not traditionally engaged in spinal cord research.
- ❖ Encourage more innovative and exploratory proposals.

### **New Jersey Neuroscience Proposal Development Workshop Series**

The New Jersey Neuroscience Proposal Development Workshop Series held no events during 2009. Nearly 200 students, fellows, and researchers have participated in these workshops to date. Attendees exchanged ideas and developed connections that may advance spinal cord research in New Jersey. Plans are in development for renewed activity in 2010.



## **GRANTS PROGRAM FOR FY2010**

In 2010, the NJCSCR will return to two grant cycles, 2010B and 2010A. The NJCSCR has allocated up to six million dollars for spinal cord research projects in 2010, but is not required to award any or all of that amount. The Exploratory RESEARCH grant Program will be available for the first time in FY2010.

### **2010 B Grant Cycle**

**Grant Application Deadline: June 8, 2009**

**Award Notification Date: November 30, 2009**

#### **Available Grant Programs:**

- ❖ Individual Research Grants
- ❖ Exploratory Research Grant
- ❖ Fellowship Grants

### **2010 A Grant Cycle**

**Grant Application Deadline: December 8, 2009**

**Award Notification Date: June 1, 2010**

#### **Available Grant Programs:**

- ❖ Individual Research Grants
- ❖ Exploratory Research Grant
- ❖ Fellowship Grants



# NEW JERSEY SPINAL CORD INJURY REGISTRY

The Spinal Cord Research Act mandates the establishment and maintenance of a central registry of persons who sustain spinal cord injuries throughout the State. NJCSCR has been supporting the work of the NJDHSS' Center for Health Statistics to create the mechanism for the collection and analysis of spinal cord injury data.

In 2007, NJCSCR and NJDHSS Center for Health Statistics entered into a second three-year Memorandum of Agreement to further this effort. All Level 1 trauma centers are now equipped to collect and submit comprehensive data electronically. Plans are underway to enable an on-line system allowing all New Jersey acute care facilities to participate.

When fully established, the registry will serve as a resource for research, evaluation, and information on spinal cord injuries. CHS publishes an annual report providing data on spinal cord and brain injury in New Jersey.

The Spinal Cord Research Act mandates the establishment and maintenance of a central registry of persons who sustain spinal cord injuries throughout the State. NJCSCR has been supporting the work of the NJDHSS' Center for Health Statistics to create the mechanism for the collection and analysis of spinal cord injury data.

Table 10 summarizes data collected by CHS on non-fatal hospitalizations for spinal cord injury in New Jersey for the years 2006-2008.

Over that period 2006-2008, there were 1,064 non-fatal admissions. Men are more than twice as likely as women to suffer a serious spinal cord injury; blacks similarly vs. other ethnic groups. 15-24 year-olds, and the elderly are at greatest risk, though from different causes - vehicular for the former, falls for the later.

<b>Groups</b>	<i>n</i>	<i>Rate</i>
<b>Total</b>	<b>1,064</b>	<b>3.9</b>

<b>Sex</b>	<i>n</i>	<i>Rate</i>
<b>Males</b>	<b>714</b>	<b>5.6</b>
Females	350	2.3

<b>Age</b>	<i>n</i>	<i>Rate</i>
Under 15 years	24	0.5
<b>15-24 years</b>	<b>161</b>	<b>4.8</b>
25-44 years	240	3.3
45-64 years	317	4.6
<b>65 years and older</b>	<b>322</b>	<b>9.4</b>

<b>Race &amp; Ethnicity</b>	<i>n</i>	<i>Rate</i>
White non-Hispanic	602	3.2
<b>Black non-Hispanic</b>	<b>223</b>	<b>6.5</b>
Hispanic	127	3.4
Other race/ethnicity	81	-
Asian/Pacific Islander	31	2.3

<b>Mechanism</b>	<i>n</i>	<i>%</i>
All vehicular	266	25.0
<b>Falls</b>	<b>462</b>	<b>43.4</b>
All other injuries	336	31.6

Table 10 Non-fatal spinal cord injury hospitalizations, New Jersey, 2006-2008



## FINANCIAL STATEMENTS

The activities and programs of the NJCSCR are supported by the New Jersey Spinal Cord Research Fund as established by the Act. A one dollar (\$1.00) surcharge is imposed on all fines or penalties levied under the provisions of Title 39 of the Revised Statutes or any other motor vehicle or traffic violation. The revenue surcharge is collected and forwarded to the State Treasurer and deposited annually in an interest-bearing account designated as the New Jersey Spinal Cord Research Fund.

The Fund opened SFY 2009 with a balance of \$7.18 million. Revenues and interest fell by \$0.4 million to \$4.28 million in 2009, bringing the total fund to just under \$11.47 million.

Disbursements and expenses for SFY 2009 were \$2.43 million. \$2.01 million was paid out to grantees and \$426,000 was spent for office and administrative expenses. The Fund closed the year with a balance of \$9.03 million.

The NJCSCR is committed to granting a substantial majority of the Fund each year to support as much meritorious research as possible, while retaining the ability to meet expenses. SFY 2010 disbursements to grantees of \$6.03 million and expenses of \$571,918 are projected for budgeting purposes.

	SFY 2009 <i>Projected</i>	SFY 2009 <i>Actual</i>	SFY 2010 <i>Projected</i>
<b>Opening Fund Balance (July 1)</b>	\$7,148,000	\$7,187,000	\$9,033,344
<b>Revenues</b>			
Assessments <sup>1</sup>	\$4,200,000	\$4,103,000	\$4,000,000
Investments Earnings - Interest <sup>2</sup>	\$600,000	\$180,000	\$75,000
Total Revenue:	\$4,800,000	\$4,283,000	\$4,075,000
<b>Total Funds Available</b>	\$11,948,000	\$11,470,000	\$13,108,344
<b>Disbursements and Expenses</b>			
Disbursements to Grantees	\$7,035,000	\$2,010,000	\$6,030,000
Total disbursements	\$7,035,000	\$2,010,000	\$6,030,000
<b>Expenses</b>			
Administrative & Office expense	\$476,226	\$364,656	\$466,918
Professional Review Panel	\$60,000	\$50,000	\$55,000
NJCSCR Registry	\$75,000	\$12,000	\$50,000
Total expenses	\$611,226	\$426,656	\$571,918
<b>Total Disbursements and Expenses</b>	\$7,646,226	\$2,436,656	\$6,601,918
<b>Closing Fund Balance (June 30)</b>	\$4,301,774	\$9,033,344	\$6,506,426

<sup>1</sup> Net revenue variance

<sup>2</sup> Funds plus interest deposited annually in Jan.

Table 11 2009 NJCSCR Fund Balance Summary



## 2009 NJCSCR RESEARCH GRANT AWARDS

### INDIVIDUAL RESEARCH GRANTS

*"Mechanisms of Neuronal Regeneration in a Genetic Model"*, Monica Driscoll, Ph.D.  
Molecular Biology & Biochemistry, Rutgers, The State University of New Jersey  
\$393,764

*"Inducing Motor Neurons by Combinatorial Signals for SCI"*, KiBum Lee, Ph.D.  
Chemistry & Chemical Biology, Rutgers, The State University of New Jersey  
\$370,293

*"GABAergic Interneuronal Restricted Progenitors and Spinal Cord Injury"*, Hedong Li, Ph.D.  
W.M. Keck Ctr for Collaborative Neuroscience, Rutgers, The State University of New Jersey  
\$393,664

*"Molecules Promoting Axon Guidance and Synaptogenesis"*, William Wadsworth, Ph.D.  
Pathology and Laboratory Medicine, University of Medicine and Dentistry of New Jersey-RWJMS  
\$368,515

*"Role of Foxn4 in spinal Neurogenesis and Gliogenesis"*, Mengqing Xiang, Ph.D.  
Pediatrics, University of Medicine and Dentistry of New Jersey-RWJMS  
\$193,764

### FELLOWSHIP GRANTS

*"Elucidating the Interplay Between Inhibitory Factors Preventing Axon Regeneration in CNS Injury"*,  
Omar Hasan  
University of Medicine and Dentistry of New Jersey-RWJMS  
\$60,000

*"Molecular Mechanisms of Axon Outgrowth and Guidance"*, Haichang Li, Ph.D.  
University of Medicine and Dentistry of New Jersey-RWJMS  
\$100,000

*"Spinal Cord Computer Interface for Command Signal Generation"*, Abhishek Prasad  
Bioengineering, New Jersey Institute of Technology  
\$60,000

*"Continuous Microfluidic Analysis of CSF Inflammation Markers"*, Lawrence Sasso  
Biomedical Engineering, Rutgers, The State University of New Jersey  
\$60,000