

Summer Student Research Program
Project Description

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PROJECT TITLE (200 Characters max): Neuroprotection and regeneration in spinal cord contusion injury

HYPOTHESIS:

Modulation of innate immune responses in the central nervous system alters the functional outcome of spinal cord injury.

PROJECT DESCRIPTION (Include design, methodology, data collection, techniques, data analysis to be employed and evaluation and interpretation methodology)

In broad terms, the investigations focus on the design of therapeutic strategies to protect neurons and promote axonal regeneration after spinal cord injury. Rodent models of spinal cord contusion injury and intrathecal administration of pharmacological agents that modulate the innate immune and inflammatory responses are used in conjunction with in vitro approaches in order to investigate the effects of the treatment on the functional outcome after injury and to unravel the underlying molecular mechanisms of neuroprotection and regeneration. Spinal cord contusion injury is induced by use of the Infinite Horizons Impactor. Motor function is assessed by the Basso, Beattie, Bresnahan test. Neuronal cultures are established from day 15 rat embryos and maintained in vitro for a week until maturation. Molecular, cellular and histological approaches are used to define mechanisms.

SPONSOR'S MOST RECENT PUBLICATIONS RELEVANT TO THIS RESEARCH:

IS THIS PROJECT SUPPORTED BY EXTRAMURAL FUNDS?

Yes or No

(IF YES, PLEASE SUPPLY THE GRANTING AGENCY'S NAME)

THIS PROJECT IS: Clinical Laboratory Behavioral
Other

THIS PROJECT IS CANCER-RELATED

Please explain Cancer relevance

THIS PROJECT IS HEART, LUNG & BLOOD- RELATED

Please explain Heart, Lung, Blood relevance

THIS PROJECT EMPLOYS RADIOISOTOPES

THIS PROJECT INVOLVES THE USE OF ANIMALS

PENDING **APPROVED** **IACUC PROTOCOL #**
09030

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THIS PROJECT INVOLVES THE USE OF HUMAN SUBJECTS
PENDING **APPROVED** **IRB PROTOCOL # M**

THIS PROJECT IS SUITABLE FOR:

UNDERGRADUATE STUDENTS **ENTERING FRESHMAN**
SOPHMORES **ALL STUDENTS**

THIS PROJECT IS WORK-STUDY: **Yes** **or** **No**

THIS PROJECT WILL BE POSTED DURING ACADEMIC YEAR
FOR INTERESTED VOLUNTEERS?: **Yes** **or** **No**

WHAT WILL THE STUDENT LEARN FROM THIS EXPERIENCE?

Some of the principles and mechanisms underlying neurodegeneration, neuroprotection and regeneration after spinal cord injury.

Induction of spinal cord contusion injury in rodents.

Behavioral analysis of motor function.

Tissue culture, cellular, molecular techniques.

Data analysis and interpretation of results.