Implantable neuromodulation: Using ionic direct current to treat chronic pain

Neuropathic Pain Research Group, Translational Neuroscience Facility, School of Medical Sciences, Level 2/3, Wallace Wurth Building, UNSW Sydney

Supervisors:
Dr. Felix Peter Aplin; f.aplin@unsw.edu.au
A/Prof Moalem-Taylor Gila; gila@unsw.edu.au

TREATMENT OF CHRONIC PAIN USING ELECTRICAL STIMULATION

Background: This subgroup is a part of the Neuropathic Pain Research group at the Translational Neuroscience Facility. We are interested in developing new ways to treat chronic pain using electrical stimulation via neural implants. Our ultimate goal is to develop and translate new technologies to communicate with the nervous system.

OUR TOOLS

Resources/Technologies available:
- Animal models of nervous system damage
- High fidelity spinal cord and peripheral nerve electrophysiology recordings
- Soft silicone/paper device fabrication and electronics design
- Immunohistochemistry and confocal microscopy

STUDY AIMS

- Understanding how the nervous system interacts with neuromodulation devices.
- Validation and translation of ionic direct current as a chronic treatment of neuropathic pain.
- Developing novel approaches for interfacing the nervous system with computers and technology.

Our research:

AVAILABLE PROJECTS

- Test the acute effects of direct current on the health of peripheral and spinal nerves.
- Examine the potential for simultaneous recording and neuromodulation of a nerve for “closed-loop” control.
- Investigate how neuromodulation affects spinal cord responses at the input (dorsal horn) vs output (spinothalamic tract).
- Optimise the design and surgical placement of a flexible sciatic nerve cuff for chronic implantation.

OUR GROUP

The implantable neuromodulation group currently consists of:
- 1 postdoc (Felix Aplin);
- 1 PhD student (Catherine Guo); and
- 1 honours student (Tom Su).

More information (Dr. Felix Aplin, Phone: +61-402 286 711, Email: f.aplin@unsw.edu.au)