Duke University Office of Licensing & Ventures
Technology Opportunity Report # 2491

ELECTRODE ARRAY FOR DIFFERENTIAL STIMULATION OF THE NERVOUS SYSTEM

Duke University is seeking venture funding to support a start-up company based upon a breakthrough discovery that modulates neuronal activity and thereby restores function following neurological disease or injury.

The Opportunity

Electrical stimulation of the nervous system is a powerful means to modulate neuronal activity and thereby restore function following neurological disease or injury. This invention is applicable in situations where the delivery of electrical stimulation of the nervous system to treat neurological disorders is limited by unwanted side effects. The two principal areas are: spinal cord stimulation for pain (SCS) and deep brain stimulation (DBS) used to treat movement disorders (Parkinson's disease), pain, epilepsy, and psychiatric disorders (including depression). In both cases, efficacy is strongly dependent on surgical skill in placing the electrode. In cases where side effects are intolerable, surgical repositioning of the lead is required for function.

This invention would reduce the outcome dependence on electrode placement.

Lead Inventor

Warren M. Grill, Ph.D., Associate Professor of Duke Biomedical Engineering and Associate Professor in Surgery at Duke University. Dr. Grill's research interests are in neural engineering and neural prostheses and include design and testing of electrodes and stimulation techniques, the electrical properties of tissues and cells, and computational neuroscience with applications in restoration of bladder function, treatment of movement disorders with deep brain stimulation, and multi-joint limb movement. Dr. Grill is an experiences entrepreneur who holds 7 issued patents with a number of additional applications pending.

The Technology

This invention is a novel electrode array that produces differential stimulation of neurons. This differential stimulation enables the generation of the desired clinical effect(s) without generation of the unwanted side effect(s).

Seed-Stage Project Goals:

- Complete computational analysis and optimization
- Animal feasibility demonstration: two years $500,000
- Human feasibility (acute) demonstration
- Animal chronic safety testing: two years $1,000,000

Intellectual Property

Patents pending.

For Licensing Information, Please Contact:

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