

Wireless Implantable System To Restore Memory

Tech ID: 27286 / UC Case 2014-959-0

SUMMARY

UCLA researchers have developed a wireless implantable deep brain stimulation system to restore memory in individuals with traumatic brain injury.

BACKGROUND

Patients with Traumatic Brain Injury (TBI) represent a large and under-addressed population, with 1.7 million new cases in the US annually. Deep brain stimulation (DBS) is clinically used to improve symptoms in patients with Parkinson's disease and epilepsy, but its application to other maladies (such as memory restoration due to TBI) has previously not been possible. New scientific and technological advances have opened up the possibility to apply DBS to additional applications.

INNOVATION

Researchers have developed a wireless implantable DBS system for patients with TBI that delivers electrical brain stimulation. This new technology improves on their existing DBS electrode design and includes a more compact electronic unit, accomplished with improved data processing algorithms and power optimization strategies. These improvements have expanded the application for the device including use in patients with impaired memory due to TBI to restore and enhance memory.

APPLICATIONS

- ▶ DBS for:
 - ▶ Seizure prevention in epilepsy patients
 - ▶ Treatment of Parkinson's Disease
 - ▶ Treatment of chronic depression
 - ▶ Restoring and enhancing memory in epilepsy and TBI patients
- ▶ Spinal cord neurostimulation for alleviation of chronic pain
- ▶ Functional restoration of impaired sensory systems (e.g. hearing, vision, tactile sensation)
- ▶ Monitoring:
 - ▶ Neural monitoring in epilepsy
 - ▶ Cardiac rhythm management
- ▶ Brain-Machine or Brain-Computer Interfaces (BMIs & BCIs) for neural control of prosthetic devices

ADVANTAGES

- ▶ Stimulation regulated by closed loop feedback system
- ▶ Based on real-time neural recordings
 - ▶ High spatial resolution
 - ▶ High voltage sensing range
- ▶ Highly compact
 - ▶ Wireless power and data transfer to/from implantable stimulator (no implanted battery)
 - ▶ Low power consumption
 - ▶ Wireless data streaming capability to mobile device/computer
 - ▶ Simultaneous stimulation and recording capability
 - ▶ Chronically implantable

RELATED MATERIALS

- ▶ Fried, Itzhak, Nanthia Suthana, and Barbara Knowlton. "Specific deep brain stimulation for enhancement of memory." U.S. Patent No. 9,403,010.

CONTACT

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INVENTORS

- ▶ Fried, Itzhak

OTHER INFORMATION

KEYWORDS

Traumatic Brain Injury (TBI), Deep Brain Stimulation, Implantable Neurostimulation, Neuromodulation, Memory Restoration, BRAIN Initiative, Wireless Implants, Electrode Probe, Neural Engineering, Brain-Computer Interfacing (BCI), Brain-Machine Interfacing

CATEGORIZED AS

- ▶ **Communications**
 - ▶ Wireless
- ▶ **Medical**
 - ▶ Devices
 - ▶ Disease: Central Nervous System
 - ▶ Disease: Ophthalmology and Optometry
 - ▶ Rehabilitation
 - ▶ Research Tools
 - ▶ Therapeutics
- ▶ **Sensors & Instrumentation**
 - ▶ Medical
- ▶ **Engineering**
 - ▶ Other

RELATED CASES

STATE OF DEVELOPMENT

The invention has been prototyped and approved for implantation in humans over 5 years.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,363,420	07/30/2019	2014-959

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Minimally Invasive Implantable Brain Stimulation Devices And Methods For Implanting Same](#)
- ▶ [Site Specific, On Demand Deep Brain Stimulation For Enhancement Of Memory](#)

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