Minimally Invasive Implantable Brain Stimulation Devices And Methods For Implanting Same

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SUMMARY

UCLA researchers in the Department of Neurosurgery have developed a novel, minimally invasive deep-brain stimulation device concept.

BACKGROUND

For many patients suffering from a variety of movement and neuropsychiatric disorders, deep-brain stimulation (DBS) of select brain areas provides lasting relief for otherwise-treatment-resistant cases. Deep-brain stimulation requires the implantation of a neurostimulator to send electrical impulses to specific brain subregions. Deep-brain stimulation is currently FDA-approved for treatment of essential tremor, Parkinson's disease, dystonia, and obsessive-compulsive disorder and has provided therapeutic relief for chronic pain, PTSD, and enhancing memory function. Unfortunately, current DBS devices require bulky hardware tunneled across large anatomical distances, longer intracranial trajectories and are prone to complications which increase surgical time, therefore, an innovative replacement for current DBS devices remains a highly unmet need.

INNOVATION

Professor Fried and colleagues have developed a novel DBS device concept to improve treatment options for DBS patients. This device concept targets select brain subregions and reduces complications involving extra corporeal leads. Hardware for this device is low profile, with external energy transferred wirelessly to an integrated antenna in the implantable DBS device. This device concept does not require tunneling and therefore reduces surgical handling of the device and overall surgical time. In total, this DBS device concept provides therapeutic brain stimulation, while minimizing patient complications from reduced surgical time and low-profile design.

APPLICATIONS

- Treatment of conditions for which deep-brain stimulation is a current or potential future therapeutic option including Parkinson's disease, dystonia, obsessive-compulsive disorder, chronic pain, major depression, Tourette syndrome, schizophrenia, complex-partial seizures, post-traumatic stress disorder (PTSD), and/or memory enhancement (in the case of Alzheimer's or dementia)
- Brain-machine interface devices

ADVANTAGES

- Implantable *via* minimally invasive surgery
- Energy is delivered wirelessly removing the need for electrical leads
- Does not require long distance tunneling of electrical leads (i.e., from head to chest)

STATE OF DEVELOPMENT

The invention remains in the conceptual stage.

RELATED MATERIALS

- N. Suthana, Z. Haneef, J. Stern, R. Mukamel, E. Behnke, B.Knowlton, I. Fried, Memory enhancement and deep-brain stimulation of the entorhinal area, N. Eng. J. Med., 2012.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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OTHER INFORMATION

KEYWORDS

Deep brain stimulation, minimally invasive, implantable brain stimulation, brain stimulation device

CATEGORIZED AS

- **Medical**
  - Devices
  - Disease: Central Nervous System
- **Sensors & Instrumentation**
  - Medical

RELATED CASES

2014-287-0

- Wireless Implantable System To Restore Memory
- Site Specific, On Demand Deep Brain Stimulation For Enhancement Of Memory

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