



Methods Of Fabricating A Multi-Electrode Array For Spinal Cord Epidural Stimulation

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SUMMARY

UCLA researchers in the Department of Bioengineering and Department of Integrated Biology & Physiology have developed a novel array for spinal cord epidural stimulation.

BACKGROUND

The discovery of epidural stimulation therapy has been a ground-breaking achievement for the treatment of spinal cord injury that has allowed for partial recovery of motor activity in previously paralyzed patients. This procedure involves a chip that is surgically implanted into the lower part of the patients' spinal cord. This chip is connected to the circuits within the spinal cord and produces a continuous electrical current that can be controlled remotely by a device outside of the body. This current "reactivates" the nerves in the spinal cord which, paired with physiotherapy, permits voluntary movements of the lower body. Epidural stimulation therapy has also been reported to be beneficial for patients that suffer from chronic back pain, making it a potential substitute for opioids. Epidural stimulation therapy is the most advanced form of treatment available for spinal cord injury patients and continuous improvements on its design will allow for this therapy to be utilized for more patients.

INNOVATION

UCLA researchers have designed an electrode array for spinal cord epidural stimulation therapy that uses multiple electrodes to allow for flexible arrangement along the spinal cord. The polymer of which it is constructed on is flexible, durable, and can withstand spinal cord movements for long periods of time.

APPLICATIONS

- ▶ Partial restoration of motility in patients with spinal cord injury-induced paralysis
- ▶ Treatment of chronic pain as a substitute for opioid use

ADVANTAGES

- ▶ Selectable/programmable multi-site electrodes that allow for variable parameters for optimal stimulation of the spinal cord
- ▶ Increased mechanical flexibility and durability

STATE OF DEVELOPMENT

This invention has been developed and has been shown to work in mice.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,583,285	03/10/2020	2015-911

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Electrical Charge Balancing Scheme For Functional Stimulation Using Pulse Width Compensation](#)
- ▶ [Flexible Stretchable Electrode And Recording Method For Gastrointestinal Prostheses](#)

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OTHER INFORMATION

KEYWORDS

spine, spinal cord, spinal cord injury, spinal cord stimulation (SCS), epidural stimulation, electrode, paralysis, chronic pain

CATEGORIZED AS

- ▶ [Biotechnology](#)
 - ▶ [Health](#)
- ▶ [Medical](#)
 - ▶ [Devices](#)
 - ▶ [Disease: Central Nervous System](#)

RELATED CASES

2015-911-0

- ▶ [Selective Chemical Bath Deposition of IrOx on Thin Film Structure](#)
- ▶ [Ultra-Dense Electrode-Based Brain Imaging System With High Spatial And Temporal Resolution](#)
- ▶ [Wireless Wearable Big Data Brain Machine Interface \(W2b2/Wwbb\)](#)

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