Closed-Loop Modulation Of Epileptic Networks

Tech ID: 34220 / UC Case 2025-796-0

BRIEF DESCRIPTION

This technology offers a novel approach to treating epilepsy by preventing the spread of epileptic networks and improving memory deficits through targeted electrical stimulation.

FULL DESCRIPTION

This technology utilizes closed-loop electrical stimulation, specifically targeting the hippocampal region to counteract interictal epileptiform discharges (IEDs) that disrupt cognitive functions and contribute to the spread of epileptic networks. By inhibiting pathological hippocampal-cortical oscillatory coupling, it effectively prevents the expansion of epileptic networks and mitigates associated memory deficits in focal epilepsy, showcasing a promising avenue for epilepsy treatment and the improvement of neuropsychiatric comorbidities.

SUGGESTED USES

- Treatment of refractory focal epilepsy in both children and adults.
- Neuropsychiatric interventions, leveraging the modulation of interictal network dynamics.
- Advanced epilepsy management systems incorporating closed-loop electrical stimulation technology.
- Potential use in preventing epileptogenesis following brain insult, offering a prophylactic application.

ADVANTAGES

- Prevents the spread of the epileptic network, potentially limiting the progression of epilepsy.
- Ameliorates long-term spatial memory deficits, addressing cognitive comorbidities associated with epilepsy.
- Offers a targeted intervention that normalizes interictal dynamics, which may improve overall epilepsy outcomes.
- High translational potential due to non-reliance on viral vectors, genetic modifications, and the established safety of electrical stimulation.
- Technological advancements enhance the computational capacity and decrease the invasiveness of the required electronic devices.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

CATEGORIZED AS

- **Medical**
  - Disease: Central Nervous System
  - Other
  - Therapeutics

RELATED CASES

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