Epilepsy surgery techniques

Anterior Thalamic Stimulation

Corpus callosotomy

Resective epilepsy surgery.

Hemispherectomy.

Temporal lobe epilepsy surgery.

Lobectomy

Multilobar resection

Lesionectomy

Vagus nerve stimulation.

Neuromodulation

Neuromodulation for Epilepsy.

Magnetic resonance image-guided laser interstitial thermal therapy for epilepsy

Magnetic resonance image-guided laser interstitial thermal therapy for epilepsy.

Transcranial alternating current stimulation for epilepsy

Transcranial alternating current stimulation for epilepsy

iEEG Recording and Adjustable Shunt-Current Conduction Platform

You et al. proposes a compact bioelectronics sensing platform, including a multi-channel electrode, intracranial electroencephalogram (iEEG) recorder, adjustable galvanometer, and shunt-current conduction circuit pathway. The developed implantable electrode made of polyurethane-insulated stainless-steel materials is capable of recording iEEG signals and shunt-current conduction. The electrochemical impedance of the conduction, ground/reference, and working electrode were characterized in phosphate buffer saline solution, revealing in vitro results of 517.2 Ω@1 kHz (length

of 0.1 mm, diameter of 0.8 mm), 1.374 kΩ@1 kHz (length of 0.3 mm, diameter of 0.1 mm), and 3.188 kΩ@1 kHz (length of 0.1 mm, diameter of 0.1 mm), respectively. On-bench measurement of the system revealed that the input noise of the system is less than 2 μVrms, the signal frequency bandwidth range is 1 Hz~10 kHz, and the shunt-current detection range is 0.1~3000 μA with an accuracy of above 99.985%. The electrode was implanted in the CA1 region of the right hippocampus of rats for the in vivo experiments. Kainic acid (KA)-induced seizures were detected through iEEG monitoring, and the induced shunt-current was successfully measured and conducted out of the brain through the designed circuit-body path, which verifies the potential of current conduction for the treatment of epilepsy [1].

1)
You C, Yao L, Yao P, Li L, Ding P, Liang S, Liu C, Xue N. An iEEG Recording and Adjustable Shunt-Current Conduction Platform for Epilepsy Treatment. Biosensors (Basel). 2022 Apr 15;12(4):247. doi: 10.3390/bios12040247. PMID: 35448307.