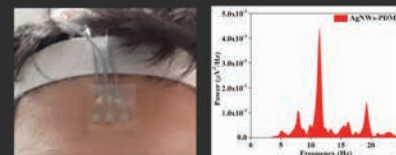


Implantable Electroencephalography (EEG) Probes for Neuro-Surgery and Neuro-Monitoring



Problem Statement: Neurological disorders are one of the important public health issues in India, with over 30 million people having common conditions such as epilepsy, stroke, tumours, Parkinson's disease and tremors. In many of these disorders, the first line of treatment is medication. However, surgical treatment is often necessary, for which diagnostics and monitoring by identifying the focal points are essential. One of the significant hurdles in neuro-surgical treatment is the prohibitive cost. Electrodes design can be drastically improved using the concepts of flexible and stretchable electronics such that a lesser area of the skull needs to be opened for surgery, provide better signals for localisation and significantly reduce the cost.

Uniqueness of the Solution: The team's indigenously designed electrodes are micro-scale electronic devices embedded in thin polymers, which can be rolled up and safely injected onto the brain surface without requiring larger

openings in craniotomy. The surface electrodes are very flexible, so they conform to the skull's contours, bringing all embedded electrodes in contact with the brain surface, providing better signal acquisition and hence better localisation of the problem zone.

Current Status of Technology: The team has developed a proof of concept of the technology of the flexible/stretchable electrodes embedded in polymers that can reliably pick up EEG signals from the forehead.

Societal Impact: Neuro-diseases are a major public health issue in India. The current finding can significantly reduce the cost associated with neuro-surgery.

Patent(s): Filed

Relevant Industries: Flexible Electronics, Nanotechnology, Healthcare.

Faculty: Prof. Dipti Gupta, Metallurgical Engineering and Materials Science.