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"Improving Intraoperative Brain Mapping Through Neurochemical Sensing"

Daryl Kipke, PhD and Parag Patil, MD, PhD
2009 funding: $100,000

Deep Brain Stimulation (DBS) devices - 'brain pacemakers' - have emerged as a revolutionary new approach to the treatment of neurological disorders. Accurate targeting of deep brain regions is necessary to obtain an optimal treatment of DBS with minimal risk to the patient. Functional mapping in deep brain surgery involves penetrating the computed target structures with movable microelectrodes to identify the neuronal structure boundaries. At present, the microelectrode senses only neuronal electrical activity in the small region surrounding the electrode tip with inherent limitations in spatial resolution and specificity that often lead to uncertainties and delays in identifying structural boundaries. There is an unmet need to improve the spatial resolution, specificity, and speed of functional deep brain mapping.

Dr. Kipke's team will develop a clinical-grade, multi-modal deep brain mapping electrode providing concurrent neural recording and selective neurochemical sensing for intraoperative deep-brain mapping surgical procedures.

Using UM Coulter TP funds, they will further develop and translate this research-grade microelectrode multi-modal sensing technology into a clinical-grade device that will allow surgeons to identify neuronal structure boundaries with greater resolution and specificity and in less time. The outcome of this project will be an innovative clinical multi-modal mapping microelectrode, including validation data and IP.

A list of all the U-M Coulter funded projects is found on the UM BME Coulter Site.

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