PURDUE INNOVATES | Office of Technology Commercialization

Chip-Scale Integrated Electrophysiology & Electrochemistry Detection and Amplification System

Compact probe platform recording both chemical and electrical brain signals for deeper disease insights.

The brain is a complex network of interconnected neurons that communicates through both electric (electrical action potentials) and chemical (neuromodulators and neurotransmitters) means. However, there is a current lack of technologies for the concurrent study of electrical and chemical signals within the brain, leading to an incomplete understanding of its signaling mechanisms. While systems for studying electrical signals with high resolution have improved, chemical signal recording systems suffer from problems such as bulky instrumentation, spatial limitations, and an inability to record both slow and fast signals. Researchers at Purdue University have addressed these limitations by designing a system comprised of a novel probe and processor setup for the simultaneous monitoring of electrochemistry and electrophysiological signals within the brain at high resolution, thus allowing for a more holistic view of neural communication. Ultimately, this new technology can be used to better characterize neural signaling pathways and lead to development of therapeutics to treat disease states.

Advantages

-High temporal resolution

-Low power consumption

-Compact instrumentation

Applications

-Drug development to address complex disease states

-Brain-computer interface technologies

TRL: 2

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Category
Digital Health & Medtech/Implantable Medical Devices
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Authors
Krishna Jayant

Further information
Patrick Finnerty
pwfinnerty@prf.org

View online

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