

Biological Sensing and Actuation Using CMOS SOI Microelectrode Arrays

Track Code: 2016-MOHA-67340

Categories:

- Biotechnology
- Electrical Engineering

Keywords:

- Biomarkers
- Biotechnology
- Electrical Engineering
- Implants
- Microfabrication

Microelectrode arrays (MEAs) are devices that serve as neural interfaces, connecting neural signals to electronic circuitry. Current MEAs are not fabricated in a complementary metal-oxide semiconductor (CMOS) platform; therefore, they suffer from low yield and low sensitivity and require packaging to bring the lead out. The CMOS version of MEA is not flexible and still requires packaging.

Researchers at Purdue University have developed a highly-flexible microelectrode array built on a complementary metal oxide semiconductor chip that senses live cells, neurons, and live tissues. This technology not only improves the yield and sensitivity, it brings the advantages of CMOS integration, e.g., wireless link and wireless powering. It can be used on concave and pulsating and moving tissues and cells, such as a retina. The technology will make it possible to achieve a single-cell characterization platform, cochlea implant, wireless retina, neural recording devices, and nerve connectors to mend severed peripheral nerves.

Advantages:

- Highly flexible
- Low noise and high fidelity
- Wireless link and wireless powering

Potential Applications:

- Cochlea implants
- Wireless neural prosthetic such as retina implant or wireless neural recording devices

People:

- Mohammadi, Saeed (Project leader)

- Pajouhi, Hossein
- Sarmadi, Mojgan

Intellectual Property:

Application Date: November 16, 2017

Type: Utility Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Application Date: November 16, 2016

Type: Provisional-Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Contact OTC:

Purdue Office of Technology Commercialization

The Convergence Center

101 Foundry Drive, Suite 2500

West Lafayette, IN 47906

Phone: (765) 588-3475

Fax: (765) 463-3486

Email: otcip@prf.org