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FREE-FLOATING UTAH ARRAY

BIOTECHNOLOGY

Self-dissolvable microelectrode array that reduces neural tissue damage through use of free-floating, independent electrodes.

TECHNOLOGY TYPE

Devices
Nanotechnology
Research Tools
Neurology

STAGE OF DEVELOPMENT

- Bench prototype demonstrates intended dissolving behavior.

- Ongoing research to collect impedance data and develop a working prototype for testing.

IP PROTECTION

Nationalized PCT Pending
Microneedle Arrays Having a Bio-erodible Substrate
WO2018053017A1

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TECHNOLOGY SUMMARY

Neural microelectrodes are crucial to the development of neural prostheses used to restore lost motor or sensory functions in the body. However, due to their large and rigid base existing commercial devices (such as the Utah array) damage neural tissue. Additionally, use in clinical applications is limited by their short lifetime – typically a few months to several years.

A new variant of the Utah electrode array minimizes this damage using a bio-erodible substrate. A biocompatible and dissolvable material binds the matrix of electrodes. The substrate dissolves in biological fluid, leaving the electrode array needles freely floating within neural tissue. The free-floating electrode array, nicknamed the "Natural Buoyancy Utah Array" uses the same construction technique of typical Utah arrays, but significantly reduces micro-motion of the array within the brain tissue. This increases array lifetime and improves overall array performance.

FEATURES AND BENEFITS

- Reduces neural tissue damage.
- Increases flexibility allowing the array to better adapt to tissue.
- Decreases inflammatory responses, scarring, and other tissue responses.

RECENT PUBLICATIONS

Leber, M., Bhandari, R., Solzbacher, F., Negi, S. (2017). Novel method of fabricating self-dissolvable and freely floating neural array. *2017 19th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS).* doi: 10.1109/transducers.2017.7994400

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