

Intelligent Microsystems Laboratory

General interests

- Micro- to meso-scale systems (sensors, actuators, fluidics, etc.) for biological, medical and environmental applications utilizing electronic/optical device technology

Self-calibrating metabolites sensors

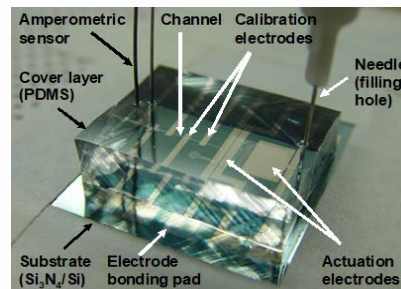
- Integrated self-calibrator based on an electrochemical actuation to generate micro-calibration environment
- Autonomous sensors with minimal human intervention (oxygen, glucose, lactate, pH, etc.)

Biodegradable solid-state sensors and actuators

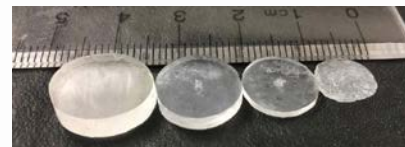
- Temporary implants with intended lifetime eliminating the need of removal surgery
- Device platform based on bioactive materials

Plant biotechnology

- Low-cost, high-throughput screening system for physical/chemical stress-tolerant crops



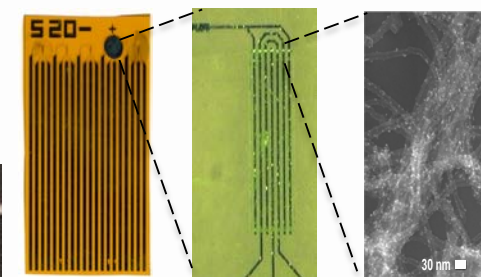
Microfluidic chip with self-calibration module



Biodegradable platform for solid-state device fabrication based on water-soluble solid materials



Flexible sensor strip for wearable biomedical monitoring



Microsensor array for volatile organic compounds with nanocomposites (metal nanoparticle / polymer nanofiber)

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Funding history

- NSF (National Science Foundation)
- NIH (National Institutes of Health)
- USDA (United States Department of Agriculture)
- NASA (National Aeronautics and Space Administration)
- IEEE Instrumentation & Measurement Society

Keywords

- Bioinstrumentation, sensors, solid-state devices, microsystems, MEMS, 3D-printed devices, nanotechnology applications

Recognitions

- NSF Career award
- IEEE Sensors Journal Associate Editor
- IEEE, SPIE Senior Member