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Nanoporous gold in 2D and 3D form, applications in ultrasensitive electrochemical superoxide bio-sensing**Ramin Banan Sadeghian**
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Superoxide anions as a member of reactive oxygen species (ROS) are involved in various physiological and pathological states. For instance, the rate of superoxide generation from skeletal muscle tissue is known to increase with contractile activity, fatigue and aging. It is therefore, very important to selectively detect and accurately quantify the release rates of super-oxides within both physiological and pathological levels. I will report on fabrication and characterization of enzyme-functionalized electrochemical superoxide biosensors built on a thick film of nanoporous gold and a three-dimensional macro-porous mesh of nanoporous gold. The devices were first tested and calibrated offline and then employed to detect superoxide release rates from C_2C_{12} myoblast cells and myotubes upon stimulation with an endogenous superoxide producing drug. Two to three orders of magnitude higher sensitivities were achieved as compared to those of earlier reported devices.

Biography

Ramin Banan Sadeghian is an Assistant Research Professor in WPI-AIMR, Tohoku University. His expertise and training in microelectronics, VLSI processes, micro- and nanofabrication, gas sensors, biosensors, semiconductor electron devices, thermo-electrics, instrumentation and industrial automation.

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