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## Advanced nanoelectrode array for electrochemical and biological sensing

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Recent advancements in the semiconductor fabrication technologies have greatly helped in advancing the understanding of electrochemistry at the nanoscale ( $10^{-9}$  m). Electrodes are being produced at the micro ( $10^{-6}$  m) and nanoscale with varied materials, designs and for diverse applications. Better electrochemical sensing and detecting capabilities are achieved with nanoelectrodes in comparison with regular microelectrodes. A lot of theoretical studies of electrochemistry at these nanoelectrodes have been proposed and developed. Despite the theoretical advancements, little has been done in experimental studies of nanoelectrodes. The progress is majorly impeded by lack of reliable fabrication procedures to produce such nanoelectrodes and test them experimentally. In the current study, a new procedure to fabricate nanoelectrode arrays for enhanced electrochemical detection has been developed. The electrochemical advantages of the nanoelectrodes over macro electrodes such as better mass transport of analytes, independent diffusional domains and faster chemical reaction rates are studied. The dimensions of the electrode are optimized to get the best possible electrochemical sensing capabilities. The optimized NEA geometry has shown an excellent detection as an electrochemical & biological sensor. This is attributed to the enhanced mass transport of analytes and faster chemical reaction rates at the surface of the nanoelectrodes.

### Biography

Savan Suri is currently a graduate student pursuing PhD in Electrical Engineering at West Virginia University, USA. His area of research is nanomaterial & nanosensors for optical, chemical & biological applications. His expertise also includes electrochemical analysis at the nanoscale, photochemical deposition of nanoparticles and nano/microfabrication techniques for plasmonic nanostructures. He also holds Masters degree in Electrical & Mechanical engineering from West Virginia University, USA.

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