

ECE Distinguished Lecture Series



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Towards Biosensor Enabled Smart Dressings for Management of Chronic Wounds: Advances and Perspectives

March 23, 2021, 10:00am-11:00am

WebEx: <https://gwu.webex.com/gwu/j.php?MTID=mba07963bfe3a48b5a39aedd0614bbb9d>

Meeting number: 120 121 2173

Password: MUndUTKP828

Abstract:

Wounds that do not heal over long periods of time (3 months) are classified as Chronic wounds. They manifest themselves in patients that have underlying diseases like poorly controlled diabetes. Chronic wounds need to be managed to prevent complications, preserve tissue function, and facilitate healing. Current practice for wound evaluation and wound management includes visually recording the wound area and wound depth to assess healing progress. The need to visit a clinic at least once every week results in poor patient compliance and long term complication with inferior health outcomes.

Our research focuses on leveraging advances in electrochemical sensing, fabrication techniques and electronics to develop a new class of affordable wound dressings that enable quantitative measurements of markers of wound healing. In this talk a novel sensor chemistry its in-vitro and initial in-vivo results are presented. This biosensor was fabricated by immobilizing uricase (UOx) a natural catalyst for Uric Acid (an indicator for wound status) as the enzyme. UA is immobilized on a flexible electrode along with Au nanoparticles and multi-walled carbon nanotubes (MWNT) and gold nanoparticles (Au) in an FCA matrix to ensure seamless electron transfer. The sensor was attached to a gauze and used on patients for proof of principle.

Biography:

Shekhar Bhansali, PhD, is Division Director (Electrical, Communications and Cyber Systems), National Science Foundation, and Lucent CALA Technologies Distinguished University Professor of Electrical and Computer Engineering at Florida International University. Dr. Bhansali received his Ph.D. in Electrical Engineering from RMIT University in Australia (1997). As a mentor, Dr. Bhansali has advised over 22 postdocs, 65 Ph.D. and master's students, and more than 130 undergraduate/high school students. Dr. Bhansali is the recipient of Alfred P. Sloan Foundation Mentor of the Year Award, ECS Sensors Division Outstanding Achievement Award, and the NSF CAREER Award. He is Fellow of AAAS, NAI, IOP and AIMBE.