

CHEMICAL ENGINEERING

SEMINAR SERIES



MIKE MCSHANE

Monday, April 03, 2017

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From Wearables to Implantables: Enabling Next-Generation Health Monitoring

ABSTRACT: Personal health monitoring is becoming increasingly accessible as the ease of producing low-cost, low-power embedded systems has fueled a rapid growth in consumer products aimed at “measuring me.” Yet, a major technology gap is in the space of continuous *chemical* sensing. In this talk, the materials-focused solutions and related optical instrumentation aimed at closing this gap will be described. Our research emphasis is on developing miniature, injectable biosensor implants with microscale and nanoscale organization to enable observation of interstitial biochemistry. These materials provide specificity through use of various receptors and enhance sensitivity through optical amplification; specifically, by luminescence intensity and lifetime or Raman scattering. Further, they employ materials that can integrate naturally with tissue, such as porous gels, enhancing prospects for accurate, rapid response and long-term monitoring. Prototype instrumentation to interrogate the implants will also be discussed. Examples of current and potential translational activities will be provided, and the major remaining challenges to long-term *in vivo* biochemical monitoring will be highlighted.

BIOGRAPHY: Dr. Mike McShane is Professor and Director of Graduate Programs in the Department of Biomedical Engineering at Texas A&M University. Prof. McShane’s primary research interests are in biomedical instrumentation, optics, biosensor technology, and biomaterials with emphasis on micro/nanofabrication for responsive materials. Over the past 20 years, Prof. McShane has pioneered the use of micro/nanoparticles, capsules, and polymer-particle composites for development of optical biosensing systems, including some being evaluated for inclusion in commercial products. Professor McShane is a fellow of AIMBE and is a Senior Member of IEEE. He currently serves as the President of the IEEE Sensors Council (2016-2017) and the Director of Graduate Programs for BME.

RECEPTION 3:30 • LECTURE 4:00 – 5:00
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