

*The Electrical and Computer Engineering Program presents
ECEN Seminar Series*

Nanotexture Tricks in Microfluidics and Lab-on-Chip to Emulate Living Systems for Early Cancer Diagnostics

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Lecture Hall 144

Light lunch will be served

Tumor cells exhibit very specific biophysical properties that can be used to distinguish them from the healthy cells. These are much softer, adherent and depict a very “active lifestyle” when compared to their normal counterparts. These mechanical properties can be used as inherent markers for tagless diagnosis of cancer cells. The malignant tumor cells also pass through hard layer of basement membrane. Solid-state materials with nanotextured features can mimic the basement membrane environment and provide mechanical strength to transduce cell’s properties into electrical signals. The sub-cellular world is becoming much relevant now with the advent of MEMS and Nanotechnology. Our lab has been working on designing nanotechnology-based approaches to engineer microdevice surfaces that utilize cell-surface interactions for highly sensitive isolation and capture of tumor cells.

This talk will present a number of nanotechnology based detection systems that utilize solid-state devices to exploit inherent physical and chemical properties for identification of cancer cells. The rapid and label-free tumor cell detection is achieved from robust and repeatable surface functionalization. The capability to sense and recognize the cells when they are very few in numbers makes these approaches suitable for diagnosis of cancer at earlier stages. These diagnostic frameworks can be extended to other investigations where cell’s viscoelastic behavior can be used for diagnosis.



Samir Iqbal, Ph.D., P.E. has published many scientific articles in peer-reviewed journals. Some of his work has been published on the covers of scientific magazines. He has been invited around the world to give keynote speeches, plenary talks, seminars and workshops at conferences, meetings and symposia in the areas of nanotechnology, chip-based diagnostics and molecular electronics. He serves on a number of USA and international scientific grant review panels and is a regular reviewer for a number of engineering, medical and scientific journals. He has also edited a book and serves on the 3 journal editorial boards.

He earned his doctorate from Purdue University, West Lafayette, Indiana, USA and worked as a post-doctoral research associate at Birck Nanotechnology Center, Purdue University before joining UT-Arlington. Dr. Iqbal is a senior member of Institute of Electrical & Electronics Engineers – USA (IEEE), and is a member of American Physical Society, American Society of Mechanical Engineers, Biomedical Engineering Society, European Society for Nanomedicine, and Sigma Xi, to name a few. He was a recipient of US National Science Foundation CAREER award in 2009. In 2011, he was chosen as Recognized Professor by Phi Kappa Phi. In 2013, Tau Beta Pi inducted him as Eminent Engineer and UT-Arlington selected him for Honorable Mention for Best Academic Advisor Award. In 2014, the College of Engineering at UT-Arlington nominated him for President's Award for Excellence in Teaching. He was awarded Sigma Xi Outstanding Faculty Mentor Award in 2014. In November 2014, he was inducted into National Academy of Innovators by UT-Arlington. Earlier this year, he was given the Best Research Mentor Award at his university.

FOR MORE INFORMATION:

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