

Analytical Seminar

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Combining Plasmons, Nanostructures and Surface Enzyme Chemistries for Ultrasensitive Bioaffinity Sensing



The multiplexed analysis of nucleic acids and proteins with microarrays has become a mainstay tool for biological researchers throughout the world. A successful detection methodology for the adsorption of multiple DNA, RNA and proteins onto microarrays at nanomolar concentrations is the simple yet powerful refractive index-based optical detection method of Surface Plasmon Resonance Imaging (SPRI). In order to facilitate the identification of better biomarkers for early disease detection and strategies for post-treatment patient monitoring, new ultrasensitive methods at extremely low (e.g., picomolar and even femtomolar) concentrations in microliter volumes. In this talk, I will describe some of the advances my group has made towards the creation of these ultrasensitive microarray detection methodologies, including:

- i) The new spectroscopic methods of Nanoparticle-enhanced SPR phase imaging and single nanoparticle SPR microscopy to detect nucleic acids and proteins at extremely low concentrations,
- ii) Novel surface enzyme chemistries for the on-chip capture, amplification and templated synthesis of DNA, RNA and proteins,
- iii) DNA and RNA aptamer microarrays for SPRI protein biosensing,
- iv) Electrodeposited gold nanowire and nanoring arrays for refractive index biosensing

**Thursday,
September 19th
12:15 pm
1315 Chemistry**

Refreshments in Charter
Street Atrium at 12pm

