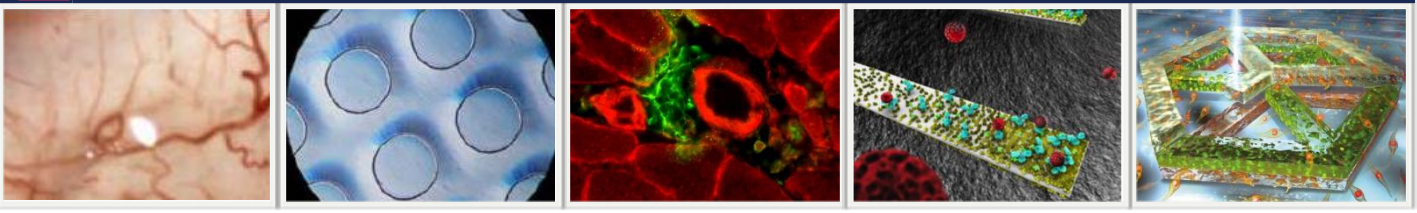
BioNanotechnology Seminar Series

Fall 2012



Improving the Sensitivity of Nanopatterned SERS Sensors by Promoting Surface Wetting

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Date: **Tuesday, October 23, 2012**
Time: **12:00 – 12:30 p.m. CST (10:00 – 10:30 a.m. PST)**
Location: **1000 MNTL at Illinois (SSM 150 at UC Merced)**

Abstract:

Nanopatterned metal surfaces are widely used for chemical sensing. One representative technique is surface-enhanced Raman spectroscopy (SERS). When analyte is placed on a solid substrate covered with densely packed metal nanoparticles, the intensity of Raman-scattered light increases by multiple orders of magnitude. However, such enhancement is highly spatially non-uniform and is concentrated in the nanogaps between adjacent particles. The ability of analyte molecules to diffuse into the regions of highest enhancement, therefore, limits the effectiveness of textured surfaces as chemical sensors. In liquid phase sensing, this is often determined by the ability of the solvent to completely wet the nanostructures.

In this talk, I will present my recent work in the analysis and promotion of surface wetting of dense arrays of gold nanodomes. I will discuss multiple approaches to nanodome wetting that focus either on the substrate or on the solvent. Finally, I will report, for the first time, label-free SERS detection of 25-base-long DNA strands on nanodomes substrates that became possible with the improved wetting. This marks an important milestone on the path of developing SERS nanodomes into a universal label-free DNA aptamer-based sensing platform.

Seminar Presented by:

Center for Cellular Mechanics
University of Illinois at Urbana-Champaign

IGERT Integrative Graduate Education and Research Traineeship
Cellular and Molecular Mechanics and BioNanotechnology

M-CNTC NCI Alliance for Nanotechnology in Cancer
Midwest Cancer Nanotechnology Training Center

CNST University of Illinois Center for Nanoscale Science and Technology