

# 2018 Fall Chem 501 Seminar



*Dr. Marc Porter*

Chemistry & Chemical Engineering  
Director of Nano Institute



Thursday – September 20, 2018  
Refreshments 3:25pm, Buehler 513  
Lecture at 3:45pm, Buehler 555

<https://nanoinstitute.utah.edu/profiles/MPorter.php>

Hosted by: Dr. Bhavya Sharma

## *“Towards Ultrasensitive, High-speed Diagnostic Tests: Nanoscience Meets Health Care”*

Surface-enhanced Raman scattering (SERS) has emerged as an intriguing approach to the creation of ultrasensitive assays for a number of diagnostically important biomarkers in the human health care arena. One variant of this approach uses an immunometric assay in which captured antigens are selectively tagged by gold nanoparticles engineered to incorporate both a monolayer of a Raman reporter molecule and a molecular recognition element. Results have shown that this type of heterogeneous immunoassay often exhibits a limit of detection notably better (~100-1000 times) than that of an enzyme-linked immunoassay (ELISA). This presentation describes the findings from an in-depth set of experiments designed to carry out an assessment of the factors that dictate the performance of the two architectures. This presentation describes the results of this work, the implications with respect to the possible origins of the difference in detection capabilities of these assays, and how to fine tune performance.

*Porter is a faculty member in the University of Utah's (UofU) Chemistry and Chemical Engineering departments. He has expertise in analytical chemistry, interfacial science, and nanotechnology. He is also the Director of the Nano Institute of Utah, which integrates researchers across Utah and the surrounding region into core research focus areas to address emerging “big science” questions in human health and energy. His laboratory has a long standing interest in sandwich immunoassay development and validation work using Giant Magnetoresistance (GMR) and Surface-enhanced Raman Scattering (SERS) detection methodologies, to name a few. For over 10 years Porter also led a joint research team with personnel from NASA's Johnson Space Center and Wyle Laboratories, a major contractor with NASA. The goal of this project was to design, construct, carry out an Earth-bound development and then microgravity flight simulations and performance assessments on a much needed water quality analyzer for eventual deployment as permanent hardware on the International Space Station (ISS). He has also co-founded several companies.*