

UNIVERSITY OF RHODE ISLAND
Department of Chemistry
SEMINAR

Room 105, Beupre Center
3:00 pm, Monday, December 5, 2016

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***“Single molecule analysis of proteins
by using OmpG nanopore”***

HOST

Jason Dwyer
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Single molecule analysis of proteins by using OmpG nanopore

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ABSTRACT:

The specific detection of proteins, such as cancer biomarkers, viral and bacterial proteins is critical for diseases diagnosis. In an era when the early or immediate detection of viral pathogens is imperative for fighting viral outbreaks, epidemics or terrorist attacks, our ability to respond to these threats depends on the capability of modern biosensors. Pore-forming proteins hold tremendous promise in biotech applications such as DNA sequencing and biosensing. This talk will describe the use of outer membrane protein G (OmpG) in *Escherichia coli* as a nanopore sensing platform, focusing on two ideas currently being explored in Chen's lab: 1) OmpG pores tethered with a high affinity ligand could distinguish between structural homologues in the presence of fetal bovine serum. Our results demonstrate the feasibility of directly profiling proteins in real-world samples with minimal or no sample pretreatment; 2) OmpG pores with an integrated enzyme recognition sequence are used to monitor the binding and cleavage reaction of caspase-7 protease in real time. Studies of the perturbation of the enzyme reaction by mutation and inhibition at the single molecule level provide new information for the structure-function-dynamics relationships of caspase-7.