

Joint Physical Chemistry & ChemBio Seminar

**Tuesday,
September 18, 2018**

11:00 am

**Room 1315
Chemistry Building**

Non-equilibrium coupling of protein structure and function to translation-elongation kinetics



Professor Edward O'Brien

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Hosts: Professor Silvia Cavagnero

Protein folding research has been dominated by the assumption that thermodynamics determines protein structure and function. And that when the folding process is compromised in vivo the proteostasis machinery — chaperones, deaggregases, the proteasome — work to restore proteins to their soluble, functional form or degrade them to maintain the cellular pool of proteins in a quasi-equilibrium state. During the past decade, however, more and more proteins have been identified for which altering only their speed of synthesis alters their structure and function, the efficiency of the down-stream processes they take part in, and cellular phenotype. Indeed, evidence has emerged that evolutionary selection pressures have encoded translation-rate information into mRNA molecules to coordinate diverse co-translational processes. Thus, non-equilibrium physics can play a fundamental role in influencing nascent protein behavior, mRNA sequence evolution, and disease. In this talk I will present how my lab's efforts are advancing our understanding of this phenomenon through the application of theoretical tools from the physical sciences.

Refreshments will be available prior to seminar at 10:45 a.m. in the Shain Atrium

Graduate Students can meet with the speaker in Room 8305F at 1:00 pm