Single molecule dynamics at soft interfaces: from basic science to a $100,000,000,000 problem.

Practical goals in materials engineering include minimal cost, maximum efficiency, and optimized longevity. As our experimental and theoretical methods to study nature’s molecular-scale design principles improve, we begin to understand that one reason nature can be so successful is that her engineering strategy often differs from ours.

Obtaining clues from the biological structure-function interplay presents challenges for theory, experiment, and data analysis. When we study one molecule at a time, we eliminate ensemble averaging, thereby accessing any underlying conformational complexity. However, we must develop new methods to increase information content in the resulting low signal-to-noise single-molecule data. Super-resolution microscopy is becoming an invaluable tool to investigate structure and dynamics driving protein interactions at interfaces. I will highlight the applications of super-resolution microscopy for quantifying the physics and chemistry that occur between target proteins and stationary phase supports during chromatographic separations. My discussion will concentrate on the newfound ability of super-resolved single protein spectroscopy to inform theoretical parameters via quantification of adsorption-desorption dynamics, protein unfolding, and nano-confined transport.

Thursday, May 3, 2018

1:30 – Meet the Speaker in room 328 Havemeyer

4:00 – Tea & Cookies in room 328 Havemeyer

4:30 – Seminar in room 209 Havemeyer

Hosted by

Laura Kaufman

Presented by

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