

Physical Chemistry Seminar

Tuesday,
November 5, 2013

11:00 am

Room 1315
Chemistry Building

Single-molecule biophysics of protein disorder



Professor Ashok Deniz
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Computational Biology
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Host: Professor Randy Goldsmith

Intrinsic Protein Disorder is increasingly recognized as a functionally important and prevalent feature in biology. The special biophysics and chemistry of intrinsically disordered proteins (IDP) are believed to play a key role in their biology, function and malfunction in the cell. However, the structural complexity inherent in these systems often limits the biophysical information available from many conventional ensemble methods. We adapt and devise novel and state-of-the-art single-molecule fluorescence methods with unique capabilities to uncover hidden structural and kinetic information about such complex systems, by minimizing the averaging intrinsic to ensemble techniques. The seminar will cover examples of our single-molecule studies which intriguingly reveal that some IDPs can be compact and yet rapidly fluctuate between multiple structures, and that IDP binding to partners and associated folding can occur on complex energy landscapes, features that relate to protein function and malfunction. Overall, our work highlights the unique capabilities of single-molecule methods to map dynamic structural complexity in proteins and other biological machines, thus providing insight critical to a fundamental understanding of biology.

Refreshments will be available prior to the seminar at 10:45 a.m. outside room 1315

Graduate Students may meet with the speaker at 1:00 p.m. in Room 8335