An NSF Integrative Graduate Education and Research Traineeship in

Integrating Nanotechnology with Cell Biology and Neuroscience

INCBN IGERT Seminar

Monday, 21 September 2009, 2:30 pm

Speaker: Kim Rasmussen
Technical Staff Member, Los Alamos National Laboratory

Modeling of DNA Dynamics and How It May Matter

I will discuss our emerging understanding of the connection between the dynamics of double-stranded DNA and DNA’s properties and bio-functionality. First, I will demonstrate how significant physical and biochemical insight has been gained with the help of a simple model. The model reproduces a variety of experimental data related to DNA denaturation, mechanically forced unzipping experiment, and even dynamical events associated with biological processes such as transcription and replication. Focusing on transcription initiation for a number of viral promoters, I will describe how the connection between DNA dynamics and DNA’s biological functionality is becoming clearer. I will conclude by describing how adequate modeling and understanding of DNA dynamics may improve our ability to identify genes in the 2 billion base pair human genome, understand and predict viral mutations, and identify hereditary diseases.

For additional information, contact:
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