CENTER FOR NANOHYBRID FUNCTIONAL MATERIALS

TUESDAY
OCTOBER 2, 2012
3:30 – 5:00 PM
UNL - N129 SEC
SCOTT ENGINEERING CENTER

Dr. Aleksandr Noy

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Strength in Numbers:

Quantifying intermolecular interactions with single molecule force spectroscopy

Single molecule force spectroscopy measurements provide a versatile and intuitively simple way to use atomic force microscopes to probe the mechanical response of non-covalent bonds to external force stimulus. Chemical force microscopy was developed as a way to probe and map these interactions in a rational and systematic way. But does the rupture strength of a bond measured in these experiments provide definitive and useful information about the interaction? The answer to this question is closely linked to understanding the fundamental dynamics of bond rupture in several different loading regimes.

We present several examples of these measurements where we probe chemical and biological interactions that range from a small number of well-defined chemical bonds to multivalent antibody-antigen interactions, to single functional group interactions, to polymer interactions with a single nanotube pore. We show that even though the measured rupture force is almost never unique for a given bond, force spectroscopy measurements can still determine the essential interaction parameters, thus providing a useful tool for biophysicists and material scientists.

Seminar hosted by Dr. Yuri Lyubchenko, UNMC Pharmaceutical Sciences

University of Nebraska Lincoln