

**UNIVERSITY OF TEXAS AT DALLAS - DEPARTMENT OF PHYSICS and
SIGMA XI RESEARCH SOCIETY****Colloquium**

Wednesday, October 29, 2008; 3:30-4:30 PM
TI Auditorium ECSS 2.102
Refreshments will be served at 3:00 PM

**Single-Molecule Studies of Mechanical (un)Folding of
Proteins, Enzymatic Catalysis and Water Structure in
Cell Membranes**

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With the ability to watch one molecule at a time, single-molecule techniques are unique in observing processes that otherwise are hidden in macroscopic observables or averaged out by ensemble measurements. Using a particular kind of atomic force microscopy (AFM) we can apply forces existing in a biological realm of proteins, and in a precisely defined direction, and to single biomolecules. Our muscles, cell transport, and cell motility (i.e., ability to move spontaneously) rely heavily on such forces. I will demonstrate the use of this technique in studying the mechanical forces exerted on single protein molecules, enzymes, and the study of water molecules confined in sub-nanometer gaps. Water in sub-nanometer gaps define the physical properties of cell membranes, and permeation of ion channels inside each cell membrane.

