



**TIFR Centre for Interdisciplinary Sciences,
Narsingi, Hyderabad 500075**

Seminar

**Single-molecule studies on forced-unfolding of proteins and
protein elasticity**

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Mechanical forces are commonly found in nature, for example, during the incessant heart muscle contraction or in the remarkably strong spider webs. Proteins, the molecular work horses of biology, play the role of 'molecular spring' in these cases. The protein based molecular springs designed by nature not only survive high stretching forces without breaking apart but also respond in a reversible manner. Molecular level understanding of their mechanical response is beginning to emerge with the development of single-molecule force spectroscopy techniques, which probe the mechanical properties of proteins and measure forces that are required to induce a conformational change or unfolding when subjected to stretching.

In this talk, I will present our recent work on the mechanical unfolding of large two-domain proteins, which undergo forced-unfolding in vivo. These proteins have complex energy landscapes with many intermediates. Single-molecule force spectroscopy not only reveals the details of the protein unfolding energy landscapes but also shows that they can be remodeled by ligand binding to modulate the protein unfolding pathways. Using single-domain proteins, we measure the protein flexibility and try to understand the relation between the mechanical stability and protein structure.

Friday, Nov 1st 2013

2:00 PM (Tea/Coffee at 1:45 PM)

Seminar Hall, TCIS