

University of Notre Dame
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**CONDENSED MATTER
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**Functional Dynamics of Biomolecules by Multi-dimensional
NMR**

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Thursday, September 23, 2010 4:00 p.m. NSH 118

In Biological molecules, such as proteins, are Nature's nano-devices that help ensure the proper growth and maintenance of living systems. Investigating their design at the atomic level is relevant for advancing both molecular biophysics and drug discovery. Historically, such investigations have focused heavily on the determination of 3-D protein structures and structure-function studies. This has (unintentionally) promoted a rather static "lock and key" view of proteins and protein interactions. But there is growing evidence that the intrinsic internal dynamics of protein molecules can also be important for function. Thus, a comprehensive study of proteins should augment structural studies with those focused on internal molecular motions.

Multi-dimensional Nuclear Magnetic Resonance (NMR) is uniquely suited for describing the internal dynamics of proteins in the liquid state. In particular, it can provide a site-specific description of dynamics over a broad range of time scales. Correlating these site-specific dynamics with biological processes such as ligand binding and catalysis helps disclose the inter-relationship between biomolecular dynamics and biological function. This presentation will provide examples of these NMR protein dynamics studies, using our recent work on the role of internal motions in supporting long-distance intra-molecular signaling.

ALL INTERESTED PERSONS ARE CORDIALLY INVITED TO ATTEND