

Characterizing order-disorder transitions in natively disordered proteins

Prof. Weis's research focuses on understanding how protein conformation fluctuates over time (dynamics) and how conformation and dynamics change in response to the binding of a ligand. The ligand might be a small molecule, another protein, or DNA. While much research over the past hundred years has demonstrated the importance of protein structure to its function, much more recently it has become apparent that *natively disordered* proteins play an equally important role. *Natively disordered* proteins have one or more regions that lack any secondary or tertiary structure under physiological conditions yet retain important biological activity. Mass spectrometry, when combined with H/D exchange labeling technique, is a sensitive probe of disorder in proteins. Research in the Weis lab during the REU program will focus on the characterization of order/disorder transitions in the regulatory domains of DNA binding proteins following ligand binding. An REU student would learn the technique of H/D exchange, how to express and purify recombinant proteins, and how to characterize proteins and peptides using HPLC and mass spectrometry. In the past ten years, Professor Weis has mentored over a dozen undergraduate researchers.