

Analytical Seminar By Prof. Silvia Cavagnero



“Sensitivity enhancement in liquid-state NMR Spectroscopy by laser-driven approaches

Despite its unmatched resolving power, NMR is an intrinsically insensitive technique. This limitation often precludes the application of magnetic resonance to a variety of biomolecular systems where concentration is either intrinsically low or needs to be kept low to avoid aggregation. This lecture will describe how the unprecedented large signal-to-noise enhancements arising from photo-chemically induced dynamic nuclear polarization (photo-CIDNP) in solution can be exploited to dramatically improve NMR sensitivity in the context of heteronuclear correlation spectroscopy. Resonances of both side-chain and backbone CH pairs can be enhanced in the context of free amino acids, polypeptides and proteins. Both theory and applications to the structural biology of protein folding will be described. Prolonged high-power laser pulsing during photo-CIDNP may damage the molecules of interest and reduce the effective concentration of the light-absorbing photosensitizer. This lecture will also introduce novel strategies developed in our laboratory to significantly overcome the above challenge.

**Thursday, November 6, 2014
12:15 p.m., Room 1315 Chemistry**