COMBINING LASER SPECTROSCOPY AND MASS SPECTROMETRY FOR CONFORMATION-SPECIFIC STUDIES OF GAS-PHASE BIOMOLECULES

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Developments over the last few years at the interface between laser spectroscopy and mass spectrometry have opened up new horizons for the spectroscopic study of biological molecules. The combination of electrospray ionization for producing large biological molecules in the gas phase with cooled ion traps and multiple-resonance laser schemes are allowing spectroscopic investigation of individual conformers of peptides of increasing size. Highly resolved infrared spectra of single conformations of such species provide important benchmarks for testing the accuracy of theoretical calculations.

This talk will give an overview of techniques employed in our laboratory for measuring conformer-selected vibrational spectroscopy of cold, gas-phase peptides of increasing size and complexity. I will show examples that demonstrate the power of these techniques and evaluate the challenges to extending them to still larger biological molecules.