JET SPECTROSCOPY OF LIFE'S BUILDING BLOCKS

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We investigate biomolecular building blocks and their clusters with each other and with water on a single molecular level. This serves to isolate intrinsic molecular properties from those that result from the biological environment We achieve this by a combination of laser desorption and jet cooling, applied to aromatic amino acids, small peptides containing those, purine bases and nucleosides. This approach is coupled with a number of laser spectroscopic techniques, including resonant multi-photon ionization, spectral hole-burning and infra-red ion-dip spectroscopy. We will discuss examples, illustrating how information can be obtained on photochemistry and spatial structure of individual biomolecules, including peptide conformations, DNA base tautomerism and details of DNA base-pairing.