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Structure and Interactions of Isolated Biomolecular 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. The motivation is the need to distinguish between intrinsic molecular properties and those that result from the biological environment. This is achieved by a combination of laser desorption and jet cooling, applied to aromatic amino acids, small peptides containing those, nucleobases 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 spatial structure of individual biomolecules, including peptide conformations and details of DNA base-pairing.