Call for papers

Special issue on
"Molecular physics of building blocks of life under isolated or defined conditions"

Submission until end of 2001
Scheduled for publication in Sept./Oct. 2002

The new research field studying "Building blocks of life under isolated or defined conditions" is showing rapid growth. New technical and experimental developments have stimulated recent progress in the investigation of biologically relevant, but thermally unstable, molecules in well defined environments. At the same time, enormous progress in computer power and the development of more efficient computational methods now make it possible to calculate large, flexible systems, such as small peptides and nucleobase pairs, at unprecedented levels of theory. While this approach does not claim to try and understand biological systems *in situ*, it does aim to explore their detailed intramolecular properties, otherwise hidden in the averaging of states, structures, conformers and sites, inherent in the solution phase and under other undefined conditions.

Special conditions, such as low temperatures, defined environments or the observation of isolated and selected or even single molecules, can generate high resolution data which, combined with theory, can provide fundamental insights into the detailed properties of biomolecules. This approach reveals their dipole moments, ionization energies, electron affinities, proton affinities, structural shape, electronic structure, photodynamics and reactivity, but also their structural arrangement and binding strength to themselfs, to other building blocks of life or to solvent molecules.

Our focus for this special issue is on the most fundamental biomolecular building blocks, including, but not limited to nucleic acid bases, nucleotides, amino acids and small as well as large peptides or proteins and complexes thereof. Investigations may include, for example, rotationally, vibrationally and electronically resolved spectroscopy with different excitation schemes, such as multiphoton ionization, laser induced fluorescence, photodissociation, photoelectron spectroscopy techniques and variety of mass spectrometric methods, such as ion-drift and ICR based approaches. New double resonance techniques allow assignments of conformer, isomer and tautomer structures which often coexist in molecules and complexes of biological interest. A great advantage of specific and detailed experimental results under well-defined conditions is the possibility of direct comparisons with theoretical calculations. This makes it possible to explore the shape of the potential energy surface, atomic charge densities, and contributions of individual forces to binding energies and solvation.

We invite all molecular physicists, chemists and biochemists, experimentalists and theoreticians alike, who study molecular systems of biological interest under well defined conditions, to contribute to this special issue.

Please send your manuscripts to the **EPJ Editorial Office**, Université Paris-Sud, Bâtiment 510, F-91405 Orsay Cedex, France
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For a faster assessment electronic submission is highly encouraged (e-mail: epjd@edpsciences.org).
Instruction for preparing the manuscripts are given at http://www.edpsciences.org

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