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Symmetry, Molecular Modelling and Simulation in Biochemistry

Guest Editor:

Dr. Paulo Martel
University of Algarve, Spain

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Message from the Guest Editor

Symmetry principles are essential tools in our understanding of the physical world. Symmetry conservation and symmetry breaking play a crucial role in living systems, from the molecular scale to the macroscopic structure. In molecular modeling, symmetry arguments are crucial for describing the electronic structure of small molecules, the secondary structures of proteins and nucleic acids, and the organization of quaternary structures from monomeric units. Viral capsid structures are examples of highly complex macromolecular structures whose assembly is guided by rigorous symmetry principles. The structures of many enzymes, ion channels, and other biomolecular machines display a high level of symmetry with a definite impact on function. Macromolecular crystals, the source material for X-ray crystallography, are structures with complex symmetries arising from the interplay of the many forces between molecular units.

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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