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Symmetry in Protein Function and Structure

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Message from the Guest Editors

Dear Colleagues,

The study of the relationship between protein structure and function is a primary focus in structural biology, with important implications in such diverse fields as biophysics, molecular biology, genetics, biochemistry, protein engineering, and bioinformatics. The stunning diversity of molecular functions performed by naturally evolved proteins is made possible by their finely tuned three-dimensional structures, which are in turn determined by their genetically encoded amino acid sequences. Furthermore, protein structures often have a certain degree of intrinsic symmetry. In fact, the visual inspection of common structural motifs reveals that many of them are symmetric. Therefore, it has been suggested that in early evolution, proteins might have been assembled from multiple identical polypeptide chains. These were then replaced by single polypeptide chains encoding multiple repeats, which fold more reliably and efficiently. To understand the structure–function paradigm, particularly useful structural information comes from the primary amino acid sequences and the associated tertiary structures...

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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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