

Special Issue Reprint

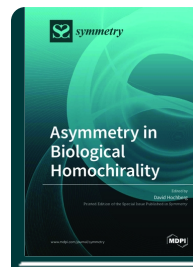
Asymmetry in Biological Homochirality

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Chirality, or handedness, is a fundamental physical characteristic, which spans the length scales ranging from elementary particles to the chiral asymmetry of spiral galaxies. The way in which chirality in chemistry, or molecular handedness, may have emerged in a primitive terrestrial environment, and how it can be triggered, amplified, and transferred, are deeply challenging problems rooted in both fundamental scientific interests and the technological potentials for science and society. Chirality constitutes a unifying feature of the living world and is a prime driving force for molecular selection and genetic evolution in biology. In this book, we offer a selection of five distinct approaches to this problem by leading experts in the field. The selected topics range from protein chirality and its relevance to protein ageing, protein aggregation and neurodegeneration, entropy production associated with chiral symmetry breaking in closed systems, chiral oscillations in polymerization models involving higher-order oligomers, the mirror symmetry breaking in liquids and its implications for the development of homochirality in abiogenesis, the role of chirality in the chemical sciences, and some philosophical implications of chirality.

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