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Function and Dysfunction of Phase Separations and Transitions Driven by Intrinsically Disordered Protein Regions

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Message from the Guest Editors

In the last decade, it has become increasingly evident that intrinsically disordered protein regions (IDPRs), either alone or in the presence of nucleic acids, have the ability to undergo liquid–liquid phase separation (LLPS), a process also known as de-mixing and leading to the formation of a condensed phase surrounded by, and dynamically interchanging with, a dispersed phase. LLPS, which has been found to occur in the cell cytoplasm, in the nucleoplasm, as well as in vitro for many purified proteins, has attracted much interest, as it drives the formation of membrane-less organelles (MLOs) (e.g., Cajal bodies, processing bodies, nucleolus, stress granules, centrosomes and aggresomes), whose function is essential for the cell and whose dysfunction is associated with various pathologies, including age-related disorders.

The aim of this Special Issue is to contribute to the development of the field and fuel additional studies aimed at gathering information on proteins undergoing LLPS in a structured and knowledgeable manner, while providing a wide range of information on the biophysical driving forces, the biological function and the regulation of these systems.



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Special Issue