Special Issue

Membranes and Memory: From Fundamentals and Mechanisms to Neuromorphic Devices

Message from the Guest Editor

This Special Issue explores the emerging understanding of biological and synthetic membranes as dynamic, adaptive, and memory-bearing systems. Membranes are no longer viewed as passive barriers; instead, they are recognized as active, responsive interfaces where electrical, mechanical, and chemical processes intertwine to generate emergent phenomena central to life and cognition.We invite contributions that investigate how external stimuli, such as electric, magnetic, optical, or ionic perturbations, modulate the structural and dynamical properties of membranes, vesicles, and lipid, polymer, and synthetic assemblies. This Special Issue also welcomes studies connecting fundamental biophysical insights with technological applications, including bilayer-based memcapacitors and memristors, neuromorphic materials, and bio-inspired computing architectures.By bringing together researchers from physics, chemistry, biology, materials science, and neuroscience, this issue aims to bridge the gap between molecular mechanisms and system-level behavior, highlighting the membrane as both a physical interface and a computational substrate for learning and adaptation.

Guest Editor

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Message from the Editor-in-Chief

You are cordially invited to contribute a research article or a comprehensive review for consideration and publication in *Membranes* (ISSN 2077-0375). *Membranes* is an international, peer-reviewed open accessjournal of membrane technology published monthly online by MDPI. The journal covers the broad aspects of the science and technology of both biological and non-biological membranes, including membrane dynamics and the preparation and characterization of membranes and their applications in water, environment, energy, and food industries. Articles contributing to better understanding of transport processes in all types of membranes are also welcome. The scientific community and the general public have unlimited and free access to the content as soon as it is published. We would be pleased to welcome you as one of our authors.

Editor-in-Chief

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