Special Issue

Electron Microscopy and Single Molecule Studies of Biomolecular Structure and Dynamics

Message from the Guest Editor

Technical innovation of the last decade has transformed the field of biophysics by bringing remarkable insight into the mechanisms employed by bio-micromachines to sustain life. Several novel techniques have been developed to study biomolecular structure and dynamics at unpreceded spatial and temporal resolution. Cryo-electron microscopy (cryo-EM) has revolutionized structural biology. With recent advances in direct electron detectors, microscope optics, and computational algorithms employing artificial intelligence (AI), it is now possible to attain atomic biomolecular structures of paramount importance for basic science and the pharmaceutical industry. These advances allow for the manipulation and study of individual biomolecules without the need for ensemble averaging, shedding light on transient intermediate states and molecular fluctuations. Finally, novel methods such as correlative light and electron microscopy (CLEM), time-resolved cryo-EM, and liquid phase EM (LPEM) have emerged, enabling the correlation of molecular dynamics with structure. This Special Issue seeks to showcase the effective integration and application of recently developed biophysical tools.

Guest Editor

Dr. Arkadiusz Kulczyk

1. Institute for Quantitative Biomedicine, Department of Biochemistry & Microbiology, Rutgers University, Piscataway, NJ, USA
2. CryoEMcorp, Bridgewater, NJ, USA

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Micromachines
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
micromachines@mdpi.com

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Editor-in-Chief

Prof. Dr. Ai-Qun Liu
1. Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University, Hong Kong, China
2. School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore 639798, Singapore

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