Special Issue

Transistor-Based Biosensors and Their Applications

Message from the Guest Editor

Transistor-based biosensors have emerged as a transformative platform in modern bioanalytical technology, thanks to their remarkable sensitivity, label-free detection, real-time response, and compatibility with portable and wearable electronics. Recent advancements in device architecture—including extended-gate FETs, electrolyte-gated FETs, and electric double-layer transistors—have greatly enhanced the detection capabilities of these systems, enabling the identification of ions, proteins, nucleic acids, exosomes, and small molecules. Additionally, innovations in nanomaterials, 2D materials, and hybrid structures, combined with advanced biofunctionalization strategies, have improved selectivity, stability, and scalability. Their integration with microfluidics, wireless communication modules, and AI-driven analytics further facilitates their application in next-generation point-of-care diagnostics. This Special Issue aims to showcase the latest advancements in the design, fabrication, characterization, and application of transistor-based biosensors across various fields.

Guest Editor

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Message from the Editor-in-Chief

Biosensors is a leading journal, devoted to fast publication of the latest achievements, technological developments and scientific research in the exciting multidisciplinary area of biosensors. Both experimental and theoretical papers are published, including all aspects of biosensor design, technology, proof of concept and application. Special issues are devoted to specific technologies and applications, and a selection of the most outstanding papers each year is recognized. Pushing the boundaries of the discipline, we invite original papers, as well as timely reviews on cutting edge fields within the subject area.

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