Special Issue

Emerging Devices and Technologies in BioMEMS for Biomarker Detection

Message from the Guest Editors

Recent advances in BioMEMS have led to the development of novel devices and integrated technologies specifically designed for the detection and analysis of biomarkers in body fluids. These biomarkers, including small molecules, proteins, nucleic acids, metabolites, extracellular vesicles, and cells such as circulating tumor cells and immune subsets, provide critical information for early diagnosis, disease monitoring, and therapeutic decision-making. Innovative BioMEMS platforms now feature enhanced microfluidic architectures, multifunctional sensing modules, and programmable control systems that enable precise, high-throughput, and label-free analysis using minimally invasive samples. Emerging trends include the integration of flexible electronics, hybrid field detection and manipulation, and AI-assisted signal processing, all of which significantly improve sensitivity, specificity, and clinical utility. We welcome original research articles, communications, and reviews that highlight novel BioMEMS devices and technologies that enable circulating biomarker detection, with an emphasis on system design, detection mechanisms, analytical performance, and biomedical applications.

Guest Editors

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Deadline for manuscript submissions

31 March 2026

Micromachines

an Open Access Journal by MDPI

Impact Factor 3.0
CiteScore 6.0
Indexed in PubMed

mdpi.com/si/244765

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