

Special Issue

Next-Generation Diagnostics for Infectious Diseases: Microfluidics, BioMEMS for Pathogen Detection and Antimicrobial Susceptibility Testing

Message from the Guest Editors

Infectious diseases cause over four million deaths annually (WHO), with antimicrobial resistance (AMR) posing a growing global health threat. Conventional diagnostics fall short: culture-based methods miss many unculturable pathogens, while molecular tools like PCR cannot differentiate between live and dead microbes. These limitations hamper effective monitoring of water, food safety, and timely clinical decisions. Microfluidics and BioMEMS technologies offer transformative solutions by integrating pathogen enrichment, viability testing, and antimicrobial susceptibility assays into compact platforms. Advances in multiplexed biosensing, AI-driven analysis, and portable design make these tools especially valuable in resource-limited settings. This Special Issue invites original research and reviews on emerging technologies in pathogen detection, including:

- Novel sensing mechanisms;
- Microfluidic systems (droplet-based, lab-on-disc, paper-based assays);
- BioMEMS devices (impedance arrays, mechanical sensors);
- AI-enhanced diagnostics;
- Multidisciplinary applications (wearable sepsis monitors, AMR surveillance, outbreak tracking).

Join us in shaping the future of infectious disease diagnostics.

Guest Editors

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Message from the Editor-in-Chief

Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. *Sensors* organizes Special Issues devoted to specific sensing areas and applications each year.

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