Special Issue

Next-Generation Fluorescent Sensing for Low-Cost Chemical Analysis

Message from the Guest Editor

Next-generation fluorescent sensing is transforming chemical analysis by offering low-cost, high-sensitivity detection for applications in analytical chemistry, environmental monitoring, healthcare, food safety, and industrial processing. These technologies combine high sensitivity and specificity with portable, affordable platforms. Innovations in fluorescent nanomaterials, molecular probes, and integrated device engineering now enable real-time detection of diverse analytes with minimal sample preparation. By integrating nanomaterials, miniaturized devices, and intelligent data processing, these sensors provide rapid, accurate measurements of low-concentration compounds. Unlike traditional lab-based methods that are costly and time-consuming, modern fluorescent sensing platforms are designed for portability and ease of use, supporting point-of-care diagnostics and on-site testing in resource-limited settings. This shift toward accessible and scalable chemical analysis is driving more responsive, decentralized decision-making in science, healthcare, and environmental management.

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