

Special Issue

New Advances in Functional Nanomaterials, Nanomedicines and Biosensors Based on Nucleic Acids

Message from the Guest Editors

Nucleic acids, including DNA and RNA, play important roles beyond genetics. Recently, they have been widely applied in functional nanomaterials, nanomedicines, and biosensors. In nanomaterials, nucleic acid-based structures like DNA enzymes and aptamers are combined with materials such as gold nanoparticles and MnO₂ nanosheets for targeted drug delivery, gene regulation, imaging, and sensing. In nanomedicine, nanotechnology improves the delivery of siRNA, miRNA, and DNA by protecting them from degradation and increasing bioavailability. For biosensing, aptamers and DNAzymes serve as biorecognition elements, enabling detection of pathogens, gene mutations, and biomarkers through measurable signals. These applications offer high sensitivity and specificity, making nucleic acids powerful tools in diagnostics and biomedical research.

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