

Ultrasensitive DNAzyme-Based Colorimetric Assay for Target Nucleic Acid detection

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A DNAzyme-based colorimetric assay for DNA detection has been developed with high sensitivity. This assay relies on two nanoprobe (i) the gold nanoparticles modified with both capture DNA and peroxidase mimicking DNAzymes for DNA recognition and signal amplification, (ii) the capture DNA coated magnetic nanoparticles for rapid separation of target nucleic acids. For DNA detection, the DNA capture probe is used to construct complexes for “sandwich”-based DNA detection. The peroxidase mimicking DNAzyme acts as a biocatalyst for the generation of a blue-green product ABTS⁺ from colorless substrate ABTS in the presence of H₂O₂. The color change could be detected visually and measured by UV-spectrophotometer. This DNAzyme-based colorimetric assay allowed for highly sensitive detection and separation of nucleic acids down to femtomolar level. Furthermore, this assay demonstrated great potential in analyzing and separating biological molecules.