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Paper Title:	Compact and Quantitative Point-of-Care Molecular Diagnostic Platform using Gold Nanoparticles
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Abstract

Developing accurate, rapid, and affordable Point-of-Care Testing (POCT) technologies has been a key strategic focus in the field of biomedical research. In particular, achieving compact, real-time, and convenient molecular diagnostics has significant clinical, social and economic importance. Gold nanoparticles (AuNPs) provide a pathway towards fast and convenient molecular detection due to the localized surface plasmon resonance (LSPR) characteristics. AuNP assays have been traditionally relying on visual interpretations, which is prone to human errors. Quantitative methods often require the use of bulky, power-consuming, and expensive microplate spectrophotometers. This article proposes a precise, low-cost, and compact molecular diagnostic platform where it quantitatively measures AuNPs' response to target nucleic acids and achieves a limit of detection (LOD) less than 100nM. The proposed system serves as a blueprint for developing future fully customized molecular diagnostic systems for POCT applications.
