

Direct Visual Detection of Nucleic Acid using Gold Nanoparticles

Abstract

Gold nanoparticles (AuNPs) are well recognized tools for visual DNA detection. Most reports on its use have however been restricted to synthetic or PCR amplified DNA sequences. Herein, we describe a visual DNA detection method that can detect unamplified genomic DNA sequence specifically, using simple reagents and AuNPs, without the need for PCR. This strategy applies thiolated probes and AuNPs to detect genomic DNA. The thiolated probes, in the presence of target *Salmonella* genomic sequences, cause the AuNPs to aggregate irreversibly, producing a red to purple colourimetric change. As little as 608,000 copies (at 37fM) of the salmonella genome were thus detected visually, by eye, without the need for a power source or sophisticated instrumentation. This method thus opens in-roads to direct visual detection, bringing sophisticated DNA analysis capabilities to the point of need.

Figure 1