Electronic Supplementary Information (ESI)

Colorimetric and Fluorescent Dual-mode Detection of MicroRNA Based on Duplex-Specific Nuclease Assisted Gold Nanoparticle Amplification

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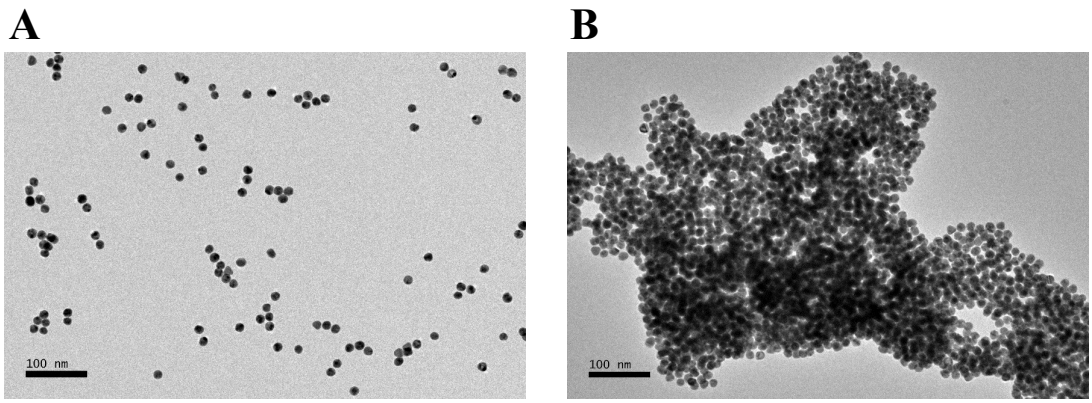

Fig. S1. TEM images of 13 ± 2 nm bare AuNPs (A) and aggregated hairpin probes (HPs)-modified AuNPs triggered by miR-21 (B).

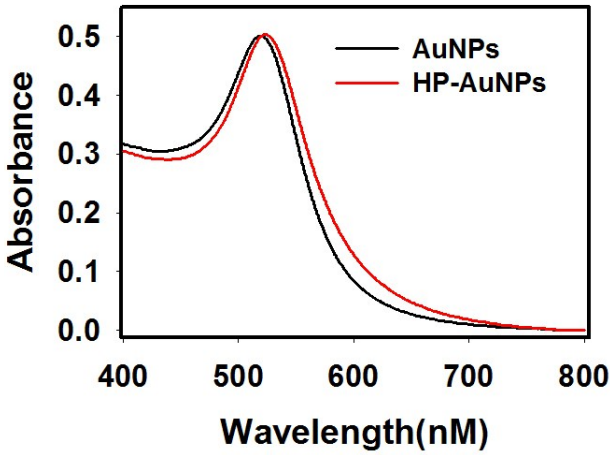

Fig S2. UV-vis spectra of AuNPs (black line) and hairpin probe-modified AuNPs (HP-AuNPs, red line). The maximum optical absorption was shifted from 518 nm to 524 nm after modification.

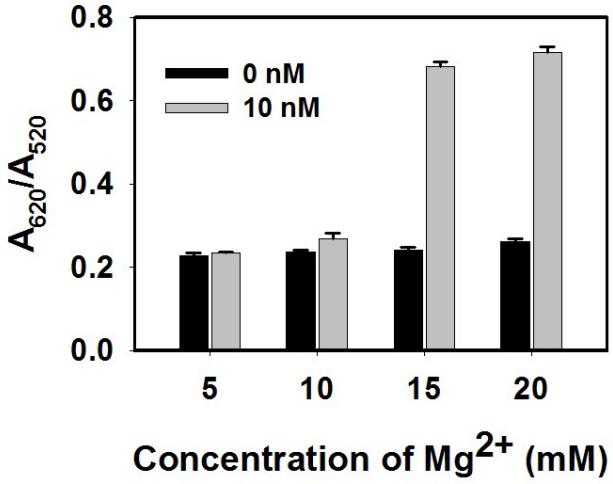

Fig S3. Optimization of Mg^{2+} concentrations in 1 × DSN master buffer (50 mM Tris-HCl, pH 8.0, 1 mM DTT) with variable concentrations (5, 10, 15, 20 mM) of $MgCl_2$ at 37 °C for 2 h. The concentration of the HPs and DSN enzyme were fixed at 80 nM and 0.2 U. Bars represent the signal response of miR-21 at 0 nM (black bar) and 10 nM (gray bar), respectively. Error bars represent the standard deviations from three independent experiments.

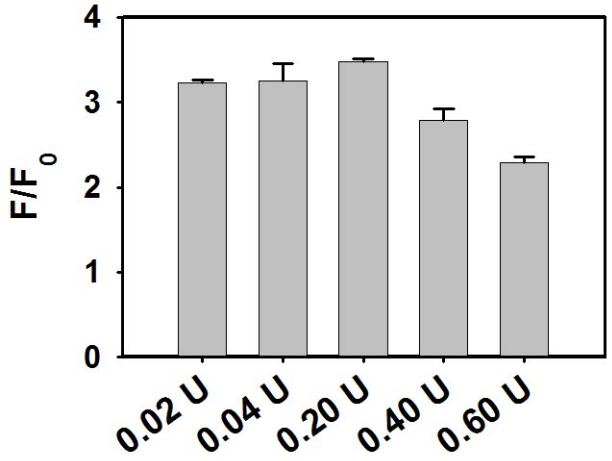

Fig S4. The variation in fluorescence signal ratio upon addition of different amounts of DSN enzyme (0.02, 0.04, 0.2, 0.4 and 0.6 U), where F_0 and F are the fluorescence signals in the absence and presence of miR-21, respectively. The reaction was performed with 80 nM HPs, 10 nM target miR-21 and various amounts of DSN enzyme in 1 × DSN master buffer at 37 °C for 2 h.

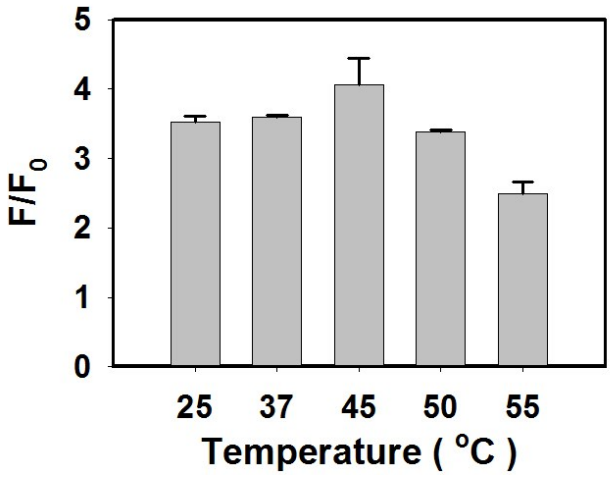

Fig S5. Optimization of reaction temperature. The performance of the assay was evaluated by the fluorescence signal ratio (F/F_0) at different reaction temperatures (25, 37, 45, 50 and 55 °C), where F_0 and F are the fluorescence signals in the absence and presence of miR-21. The concentration of the HPs, DSN enzyme and target miR-21 were fixed at 80 nM, 0.2 U and 10 nM, respectively.