Electronic Supplementary Material (ESI) for Analyst.

Supporting Information

Colorimetric Detection of Sequence-Specific MicroRNA Based on Duplex-Specific Nuclease-Assisted Nanoparticle Amplification

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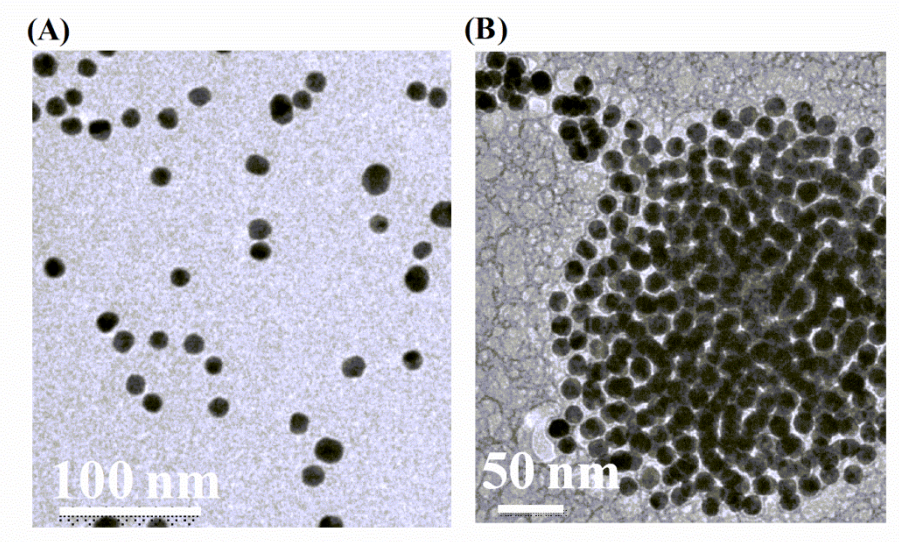

Fig. S1. (A) TEM image of AuNPs. (B) TEM image of aggregated ssDNA-modified AuNPs triggered by miR-122 (1 nM).

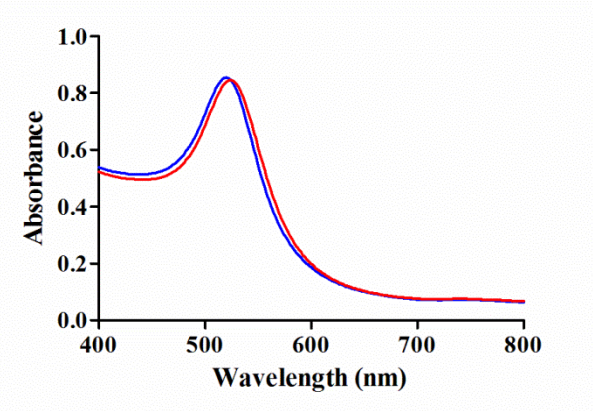

Fig. S2. UV-vis spectra of AuNPs (blue line) and ssDNA-modified AuNPs (red line).

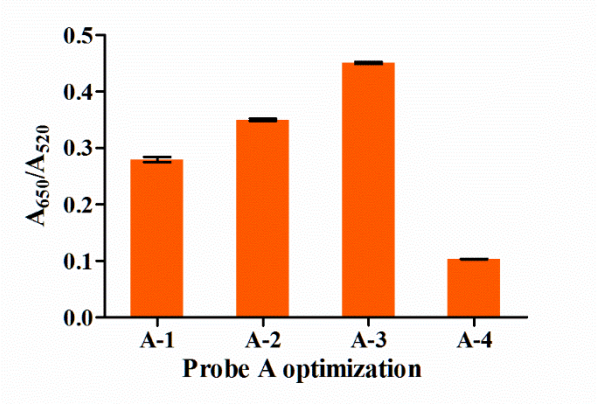

Fig. S3. Optimization of Probe A sequence. The reaction was performed with 1×reaction buffer, 1 U/μL RNase Inhibitor, 4.5 nM AuNPs, and 50 nM Probe A with different sequences (Probe A-1, Probe A-2, Probe A-3, and Probe A-4), respectively. Error bars show the standard deviation of three repetitive experiments.

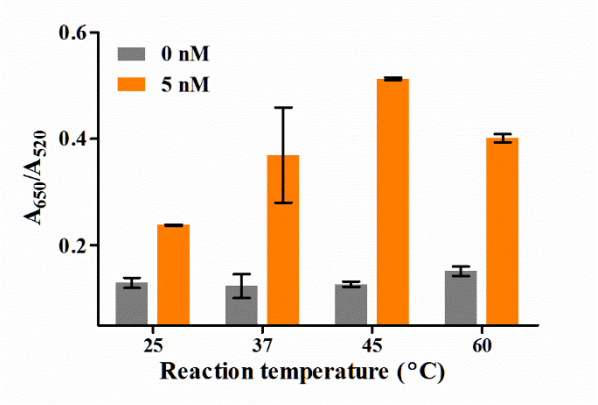

Fig. S4. Optimization of reaction temperature. The reaction was performed with 1× reaction buffer, 0.4 U/μL RNase Inhibitor, 0.15 U DSN, and 0.5 μM probe complex at different temperatures (25, 37, 45, and 60 °C), respectively. Bars represent the signal response of miR-122 at 0 nM (gray bar) and 5 nM (orange bar), respectively. Error bars show the standard deviation of three repetitive experiments.

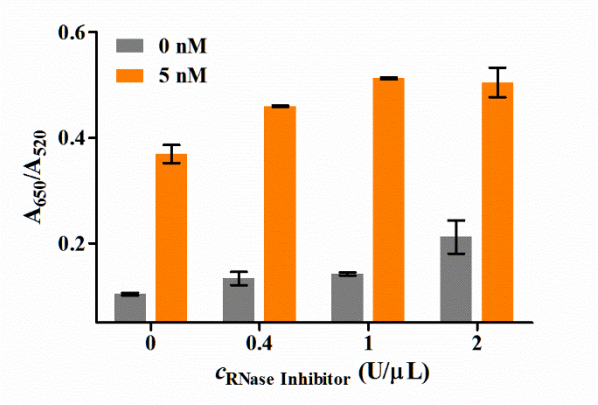

Fig. S5. Optimization of the amount of RNase Inhibitor. The reaction was performed with 1× reaction buffe, 0.15 U DSN, 0.5 μM probe complex with different amount of RNase Inhibitor (0, 0.4, 1, and 2 U/μL) at 45 °C, respectively. Bars represent the signal response of miR-122 at 0 nM (gray bar) and 5 nM (orange bar), respectively. Error bars show the standard deviation of three repetitive experiments.

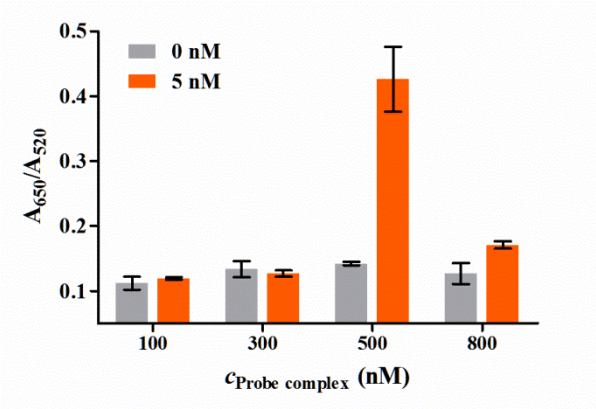

Fig. S6. Optimization of probe complex concentration. The reaction was performed with 1× reaction buffe, 0.15 U DSN, 1U/μL RNase Inhibitor, and probe complex with different concentrations (100, 300, 500, and 800 nM) at 45 °C, respectively. Bars represent the signal response of miR-122 at 0 nM (gray bar) and 5 nM (orange bar), respectively. Error bars show the standard deviation of three repetitive experiments.

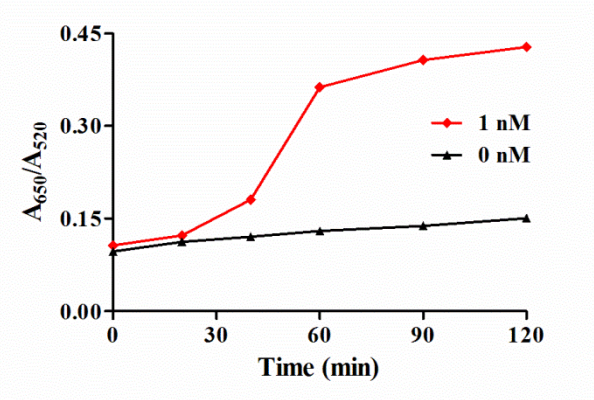

Fig. S7. Optimization of the reaction time. The reaction was performed with 1× reaction buffer, 0.15 U DSN, 1 U/μL RNase Inhibitor, 4.5 nM ssDNA-modified AuNPs and 0.5 μM probe complex with two different concentrations of miR-122 (0 nM and 1 nM) at 45 °C.

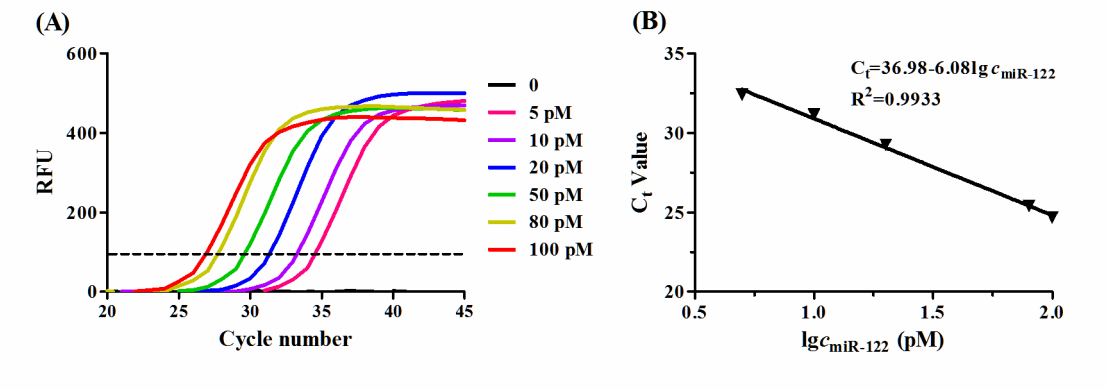

Fig. S8. (A) Quantitative real-time fluorescence monitoring of the PCR amplification reaction triggered by different concentrations of miR-122. (B) Variance of the C_t value as a function of the concentration of miR-122. Quantitative real-time PCR C_t was analyzed by CFX software version 1.1 (Bio-Rad, Hercules, CA, USA).

Table S1 Determination of miR-122 in BEL-7404 cell lysates

Detected [a] (pM)	Added (pM)	Found (pM)	Recovery (%)
6.52	20	27.35	103.13
6.52	50	57.09	101.01

[a] The concentration of miR-122 in BEL-7404 cell lysates was pre-determined by commercial miRNA detection kit.