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Supporting Information

Ratiometric fluorescence analysis for miR-141 detection with hairpin DNA-templated silver nanoclusters

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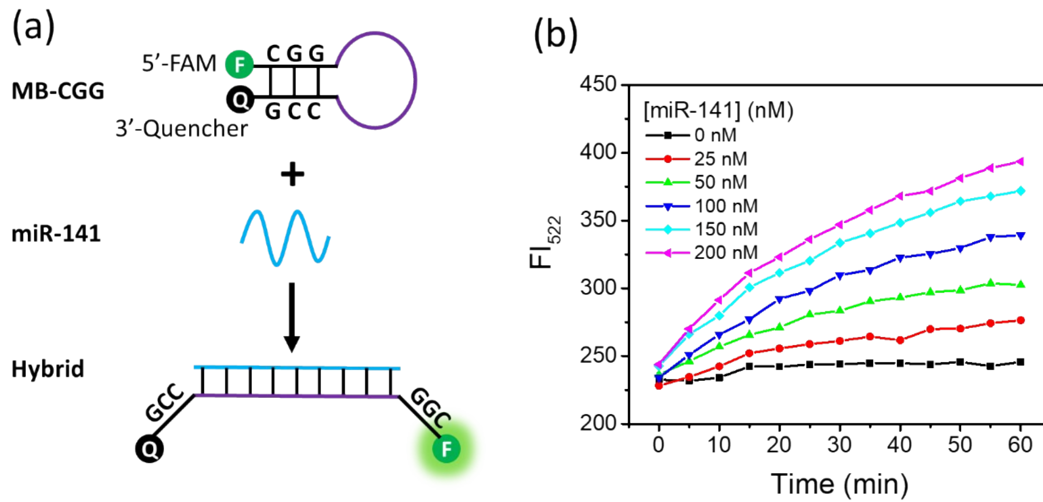

Fig. S1 Molecular beacon probe, MB-CGG, for miR-141 analysis. (a) Schematic illustration of the interaction between target miR-141 and the molecular beacon probe with a hairpin structure. The stem sequence was CGG and the loop sequence was specific to miR-141; (b) The fluorescence responses of molecular beacon probe to target miR-141 at different concentration in one hour. The fluorescence intensity of molecular beacon at 522 nm in 96 well microplate was scanned and recorded by a SpectraMax M2 fluorescence microplate reader (Molecular Devices, USA) with excitation wavelengths at 485 nm

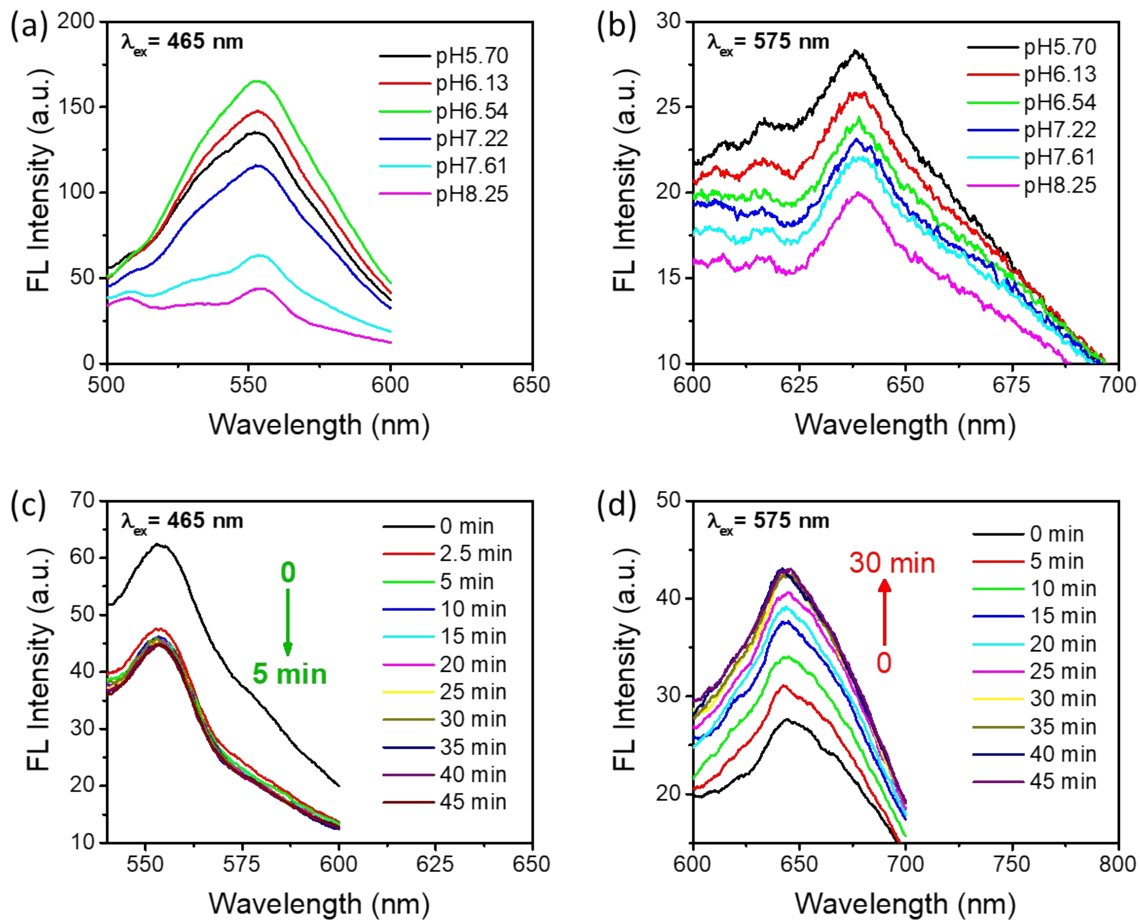

Fig. S2 Optimization of the pH and incubation time. The fluorescence spectrum of 100 nM DNA-AgNCs (a) excited at 465 nm and (b) excited at 575 nm in 10 mM phosphate buffer solution at 25 ℃ with various pH values (pH5.70, pH6.13, pH6.54, pH7.22, pH7.61 and pH8.25). The fluorescence spectrum of 100 nM DNA-AgNCs (c) excited at 465 nm and (d) excited at 575 nm after incubation with 100 nM miR-141 in 10 mM, pH 7.0 phosphate buffer solution for different time.

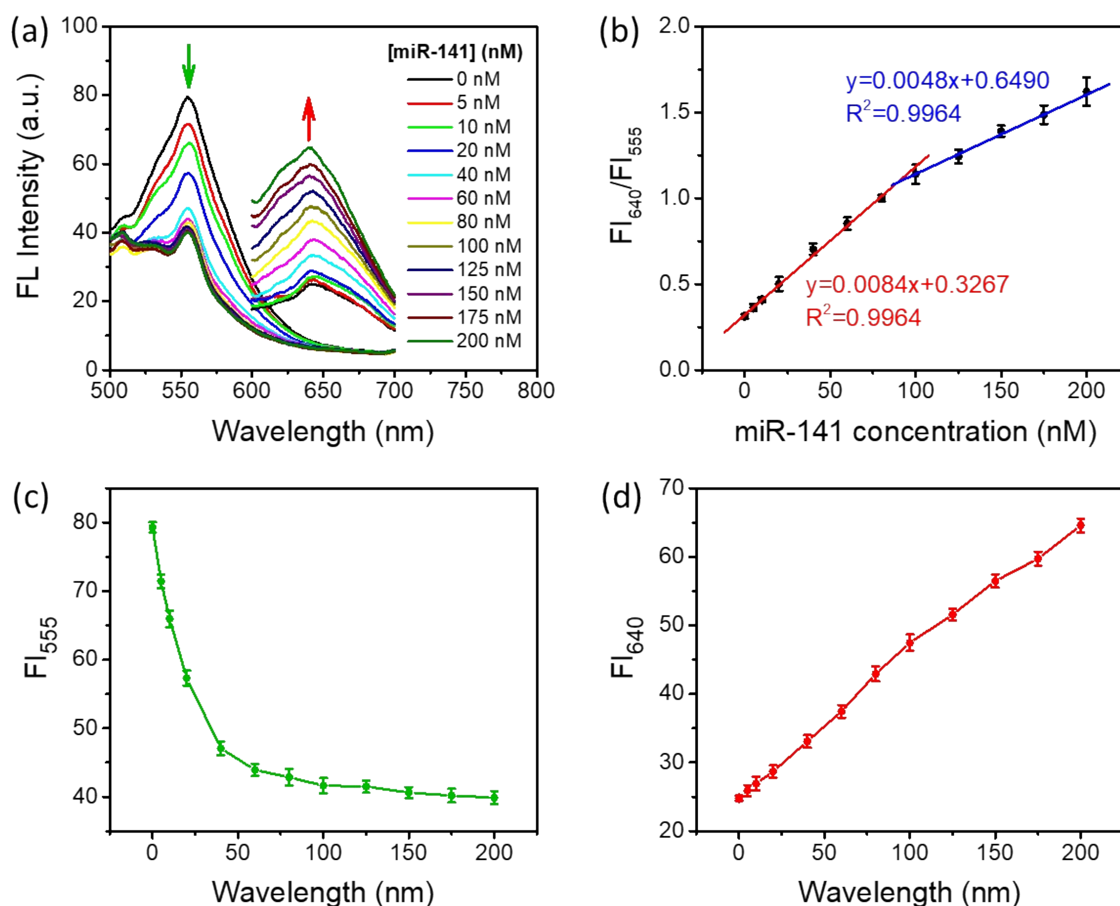

Fig. S3 Detection of miR-141 with DNA-AgNCs. (a) Fluorescence emission spectra excited at 465 nm (emission peak at 555 nm) and 575 nm (emission peak at 640 nm) in the presence of different concentrations of miR-141 from 0 to 200 nM. (b) The corresponding calibration curve of the fluorescence intensity ratio (FI_{640}/FI_{555}) to the concentrations of miR-141. (c) The relationship between the fluorescence intensity at 555 nm and miR-141 concentrations. (d) The relationship between the fluorescence intensity at 640 nm and miR-141 concentrations. The concentration of DNA-AgNCs used here was 100 nM. Error bars indicate the standard deviations of three experiments.

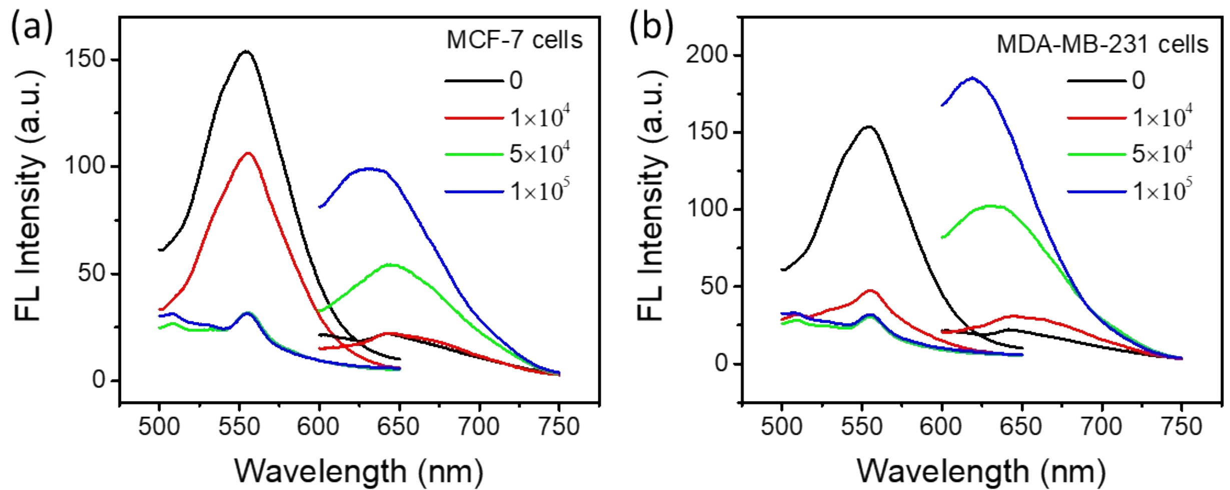

Fig. S4 miR-141 detection in cell samples. Fluorescence emission spectra of DNA-AgNCs excited at 465 nm (emission peak at 555 nm) and 575 nm (emission peak at 640 nm) in the presence of (a) MCF-7 and (b) MDA-MB-231 cell samples with different number (0, 1×10^4, 5×10^4 and 1×10^5 cells) at 25 ℃ in 10 mM, pH 7.0 phosphate buffer solution for incubation of 30 mins. 100 nM DNA-AgNCs was used in these experiments.

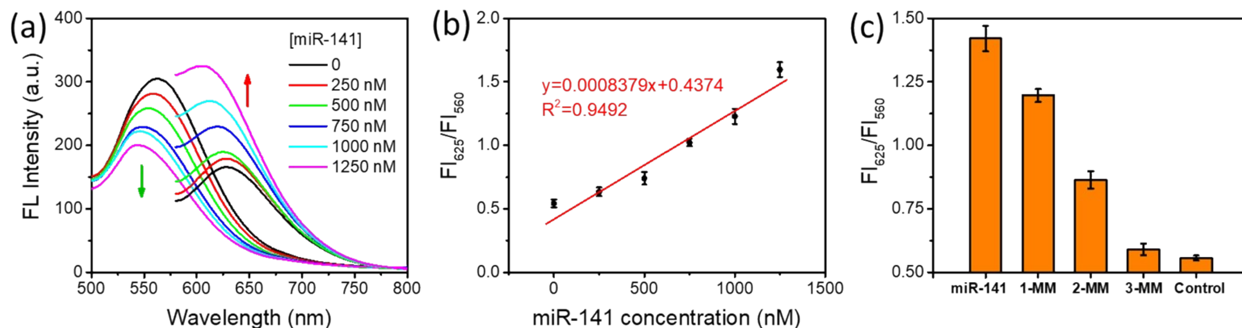

Fig. S5 D-CCGG templated AgNCs for miR-141 analysis. (a) Fluorescence emission spectra excited at 450 nm (emission peak at 560 nm) and 550 nm (emission peak at 625 nm) in the presence of different concentrations of miR-141 from 0 to 1250 nM. (b) The corresponding calibration curve of the fluorescence intensity ratio (FI_{625}/FI_{560}) to the concentrations of miR-141. (c) The fluorescence intensity ratio (FI_{625}/FI_{560}) to varied miRNA sequences. Specificity evaluation of the proposed method for single-base mismatched miR-141 (1-MM), two-base mismatched miR-141 (2-MM), three-base mismatched miR-141 (3-MM) and miR-141, 1 μM each. 1 μM D-CCGG templated AgNCs was used in these experiments. Control group had phosphate buffer added instead of miRNA sequences. Error bars indicate the standard deviations of three experiments.