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DNA-templated silver nanoclusters as label-free, sensitive detection probes for potassium ion and nitric oxide

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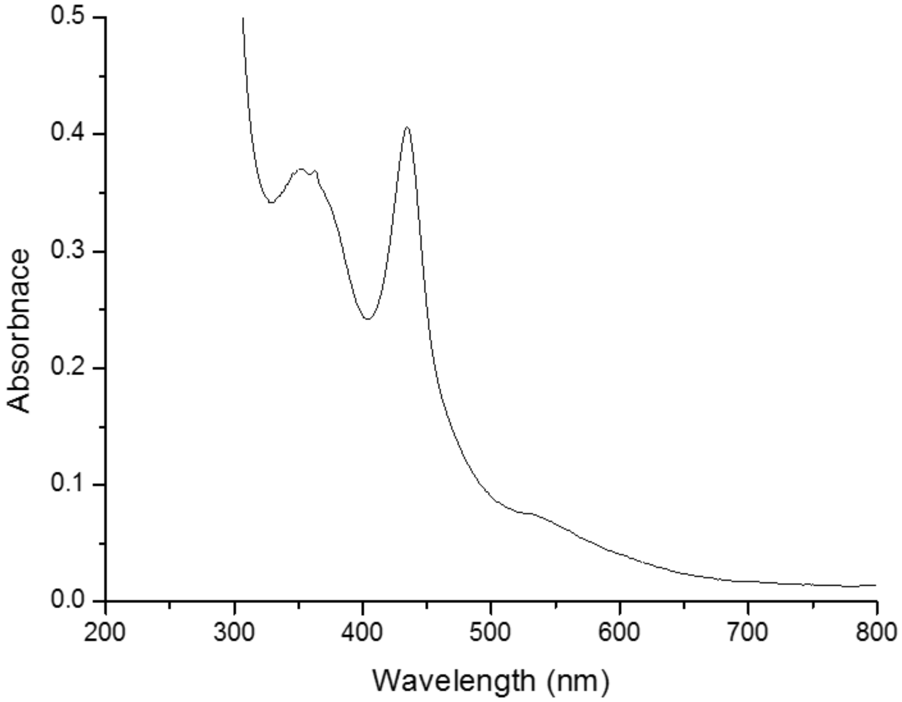

Fig S1. Absorption spectrum of DNA1-AgNCs (10 μM DNA, 120 μM Ag^{+}, and 120 μM BH_4^{-}) acquired 3h after adding BH_4^{-}.

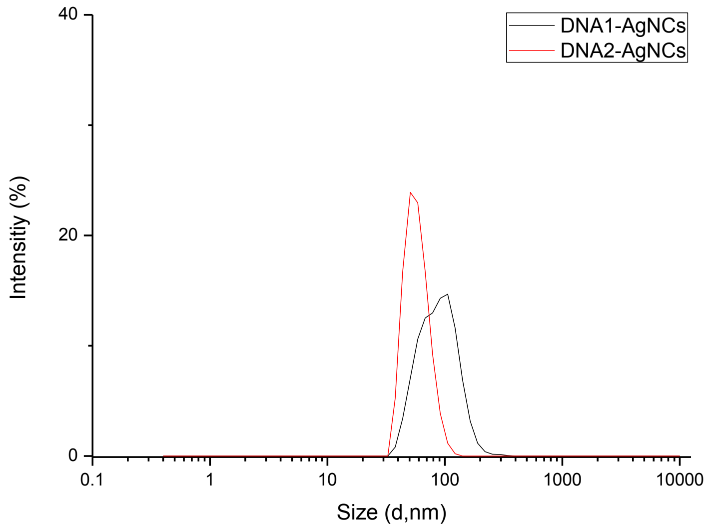

Fig S2. DLS measurement of DNA1-AgNCs, DNA2-AgNCs (5 μM) by Malvern Nano-S90 spectrometer.

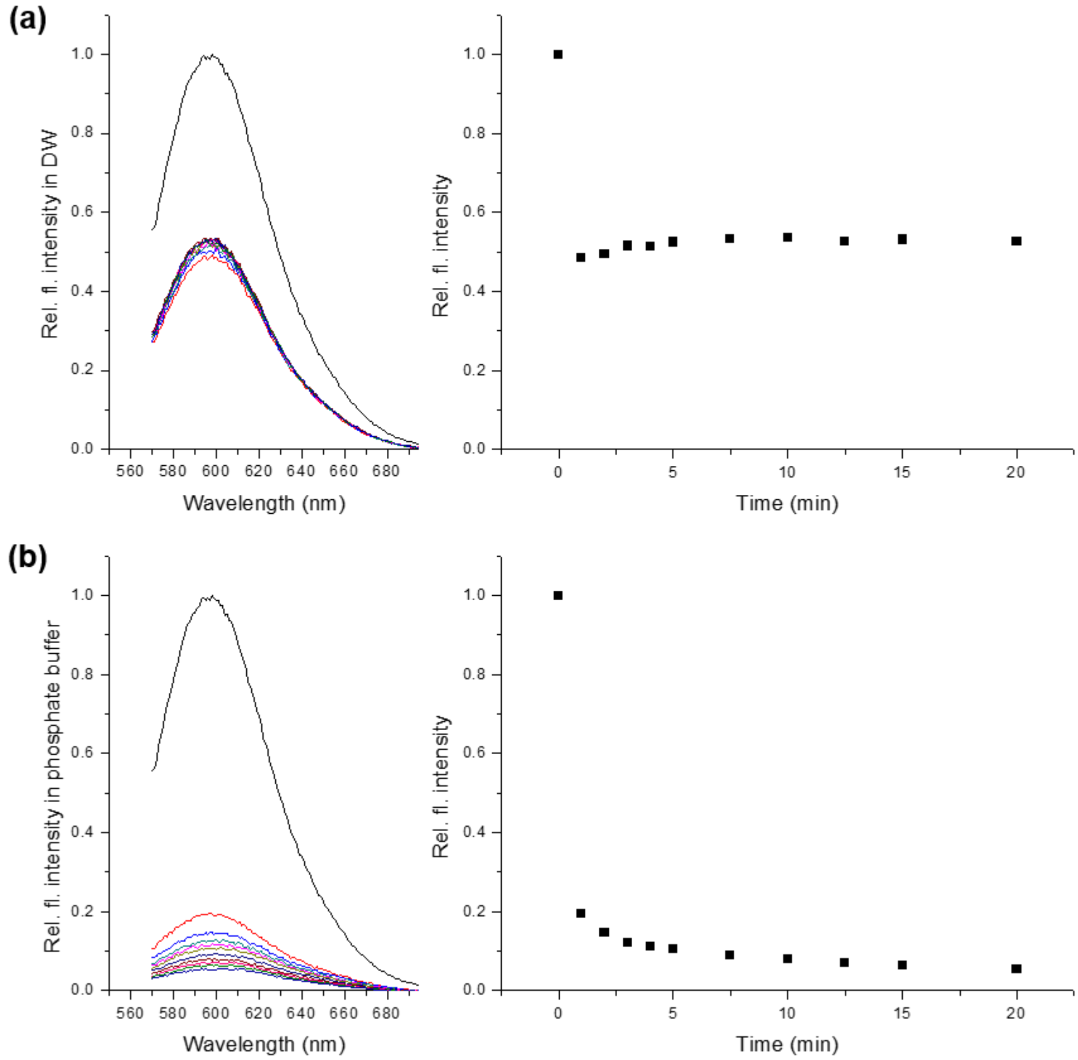

Fig S3. Fluorescence emission spectra of DNA1-AgNCs affected by different dilution solvents as (a) DW and (b) phosphate buffer (Na^+ 20 mM, Mg^{2+} 1 mM, pH 7.0). In left, fluorescence emission spectra of DNA1-AgNCs diluted with either DW or phosphate buffer (1 μM in DNA, coloured lines) depending on time (from 1 min to 20 min) are plotted when maximum emission intensity of initial DNA1-AgNCs (2 μM in DNA, black line) set as 1. Plots of the relative fluorescence intensity (I/I_0) at 595 nm excited at 540 nm during 20 min for different dilution solvent show in right.

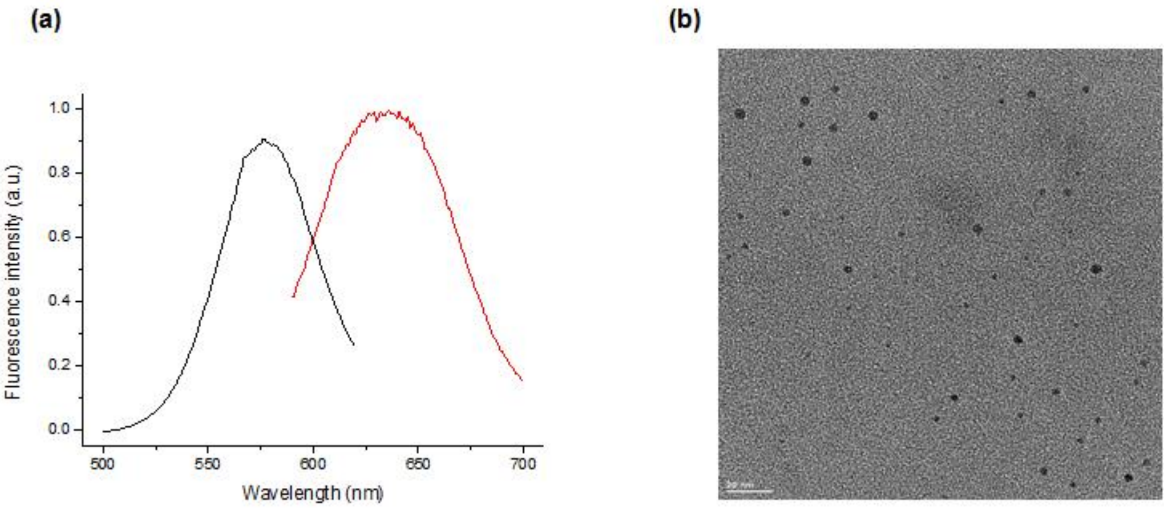

Fig S4. (a) Maximum fluorescence of DNA2-AgNCs with ex/em=570/615 nm (b) TEM image of DNA2-AgNCs

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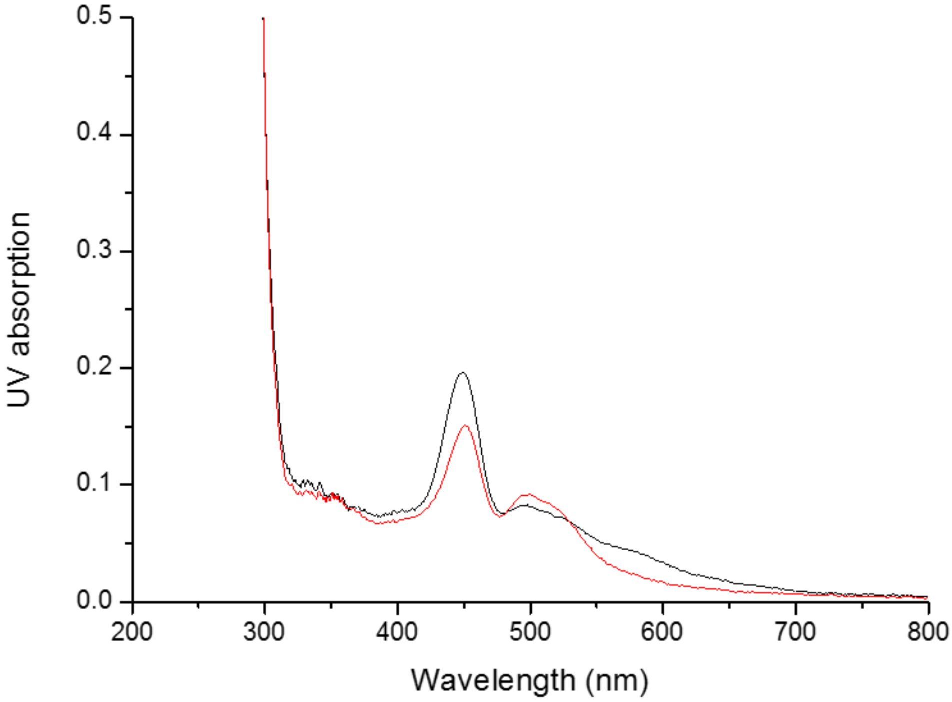

Fig S5. Absorption spectrum of DNA2-AgNCs (black, 15 μM DNA, 90 μM Ag^+, and 90 μM BH_4^-), and DNA2-AgNCs+NO (red, 15 μM DNA, 90 μM Ag^+, and 90 μM BH_4^-, NO 5.64 μM). The DNA2-AgNCs was prepared 3 h after adding BH_4^-.

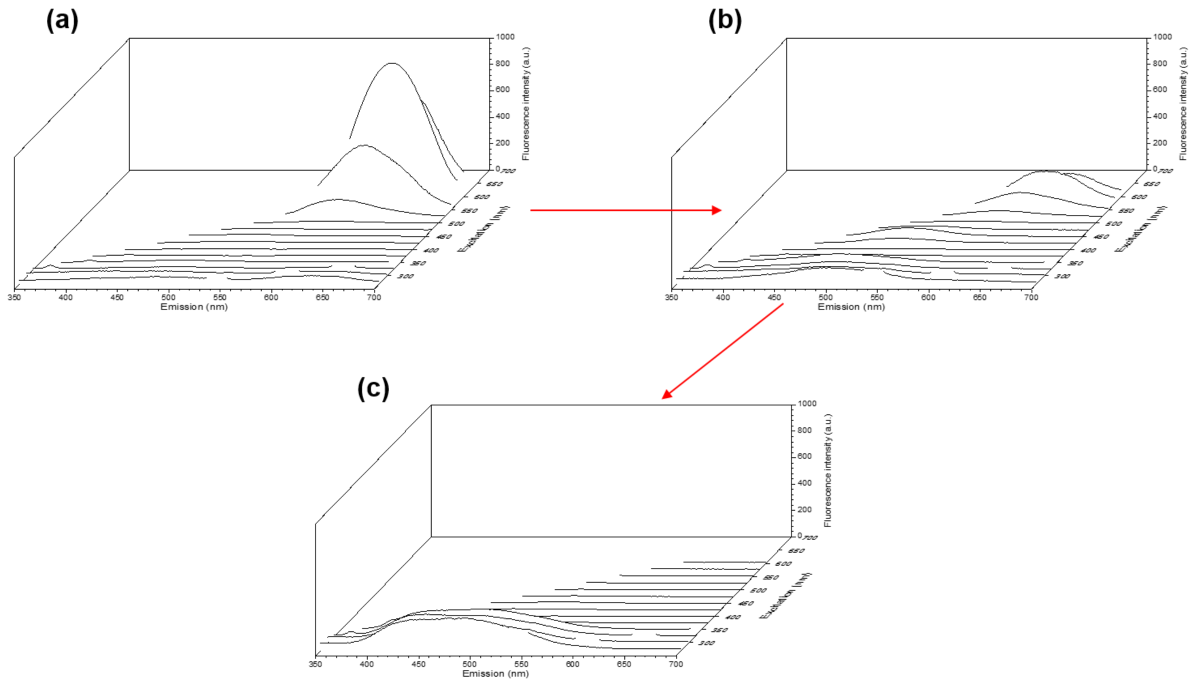

Fig S6. Fluorescence emission spectra as a function of excitation wavelengths. The prepared DNA-AgNCs was obtained using DNA2 (1 μM) with Ag^{+} (6 μM) and BH_4^{-} (6 μM). The emission wavelengths are on the bottom axis, and the excitation wavelengths are incremented by 50 nm starting at 270 nm on the right axis. All the data was obtained 3h after adding BH_4^{-}. (a) DNA2-AgNCs (b) DNA2-AgNCs+NO (5.64 μM which concentration in dynamic range) and (c) DNA2-AgNCs+NO (1.88 mM in excess) at 23^{o}C

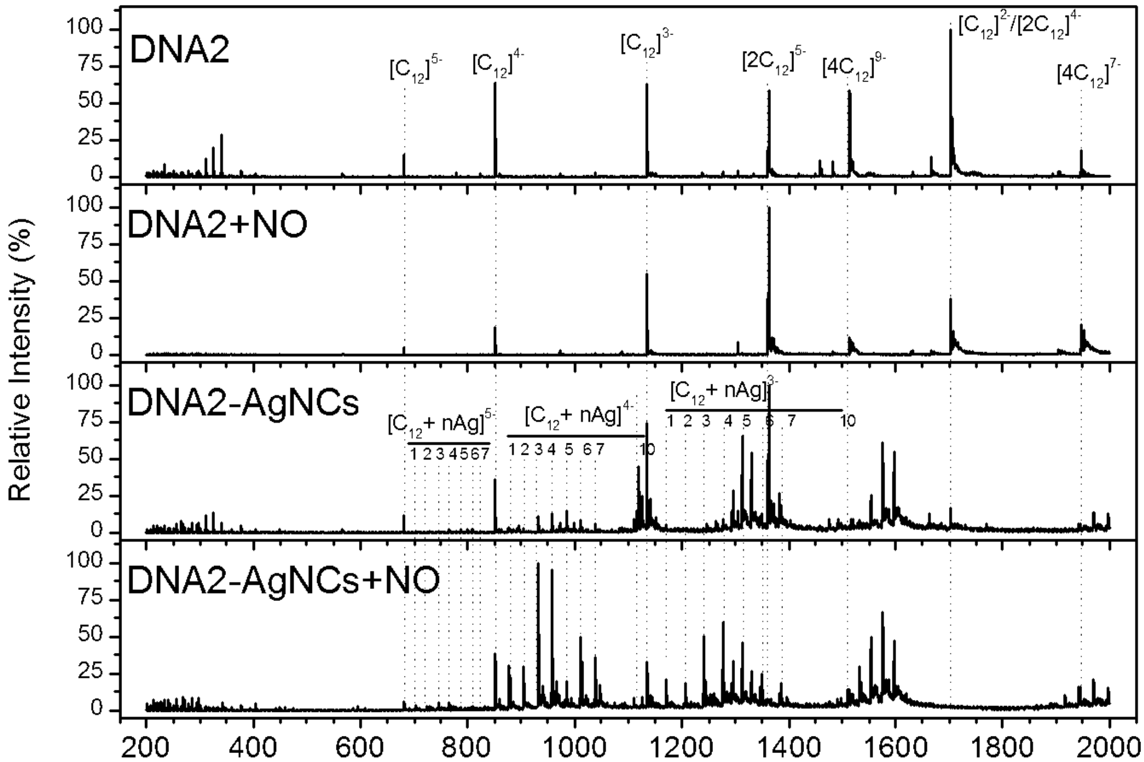

Fig S7. ESI-MS spectrum of DNA2, DNA2+NO, DNA2-AgNCs, and DNA2-AgNCs+NO.

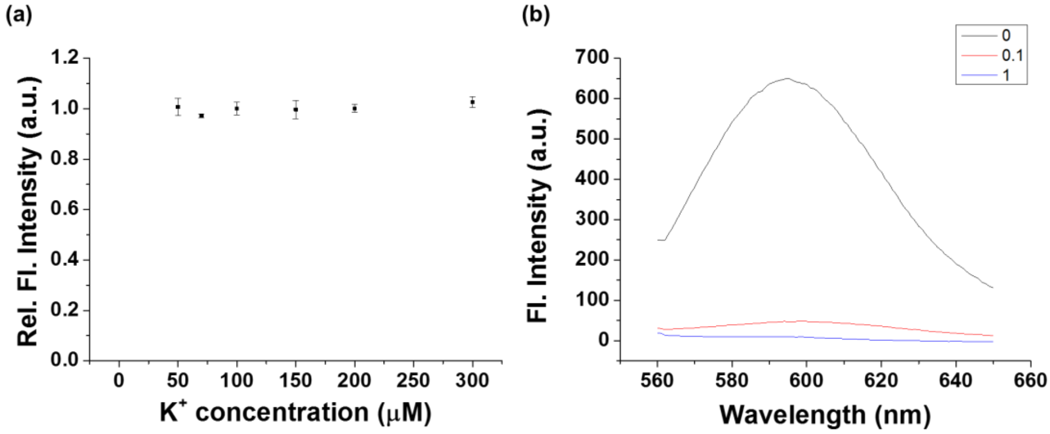

Fig S8. Change of DNA sequence for detection each K^+ by DNA2-AgNCs and NO by DNA1-AgNCs. Relative fluorescence intensity of (a) DNA2-AgNCs(5 μM) after addition of K^+ (0, 50, 70, 100, 150, 200, 300 μM), and (b) DNA1-AgNCs(5 mM) after addition of nitric oxide (0, 0.1, 1 mM). (a) The result shows the fluorescence intensity is not interfered by existence of K^+. Because in the case of DNA1, K^+ is used for inducing a DNA1 to form G-quadruplex. (b) The result shows the fluorescence intensity is immediately quenched even low concentration of NO. Because in the case of DNA2, it has 12 nts of cytosine which can be reacted with NO to uracil by deamination to make AgNCs unstable for inducing structural change.