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Supplementary information

# HIV-related DNA detection through switching on hybridized quenched fluorescent DNA-Ag nanocluster

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1. The effect of number of complementary base pairs between DNA-Ag NC and C1 on HIV DNA detection

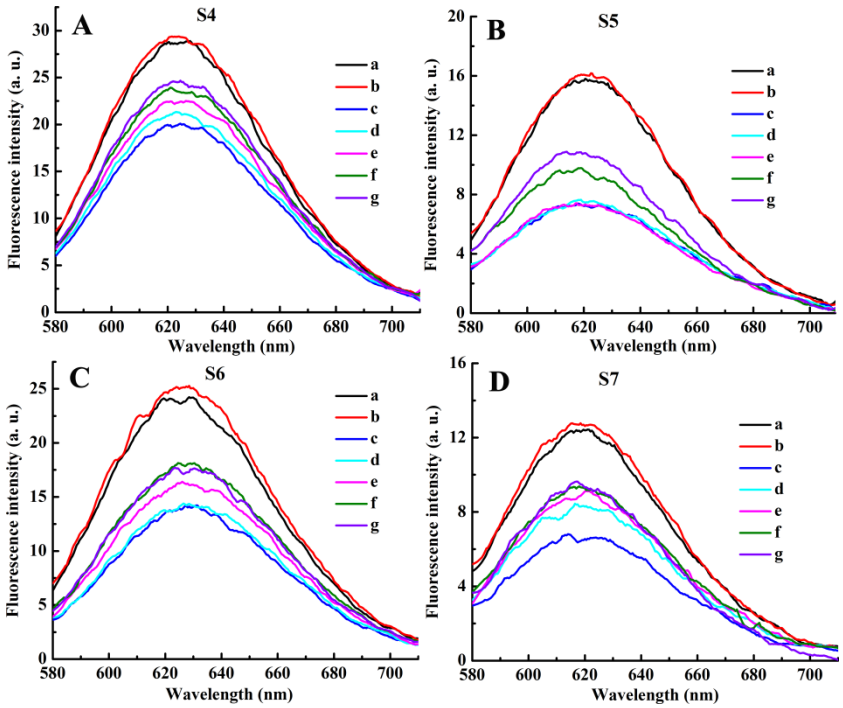


Figure S1. (A-D) Fluorescence spectra of DNA-Ag NC (150 nM) synthesized with templates of S4 – S7 under different conditions. (a) DNA-Ag NC; (b) DNA-Ag NC + HIV DNA (150 nM); (c) DNA-Ag NC + C1 (150 nM); (d - f) DNA-Ag NC + C1 + HIV DNA, HIV DNA concentration: 30, 75, 150, and 225 nM. Binding buffer: 50 mM $CH_3COONa$ and 5 mM $Mg(CH_3COO)_2$ in 10 mM PBS (pH 7.2).

2. pH value

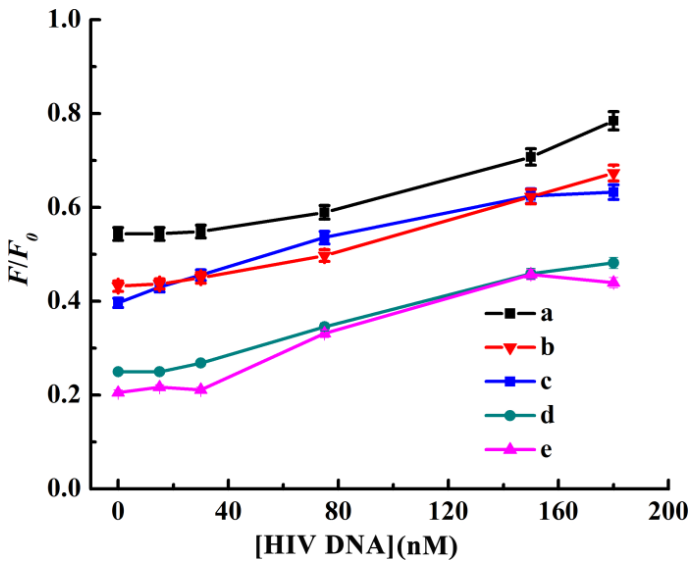


Figure S2. The fluorescence responses of S2-Ag NC (150 nM) to HIV DNA at different pH values. $F$ and $F_0$: fluorescence intensity of S2-Ag NC/C1 + HIV DNA and S2-Ag NC; pH value of 10 mM PBS (containing 50 mM $CH_3COONa$ and 5 mM $Mg(CH_3COO)_2$: 6.6, 6.8, 7.0, 7.2, and 7.4 (a - e); HIV DNA concentration: 0, 15, 30, 75, 150, and 180 nM.

3. Salt concentration

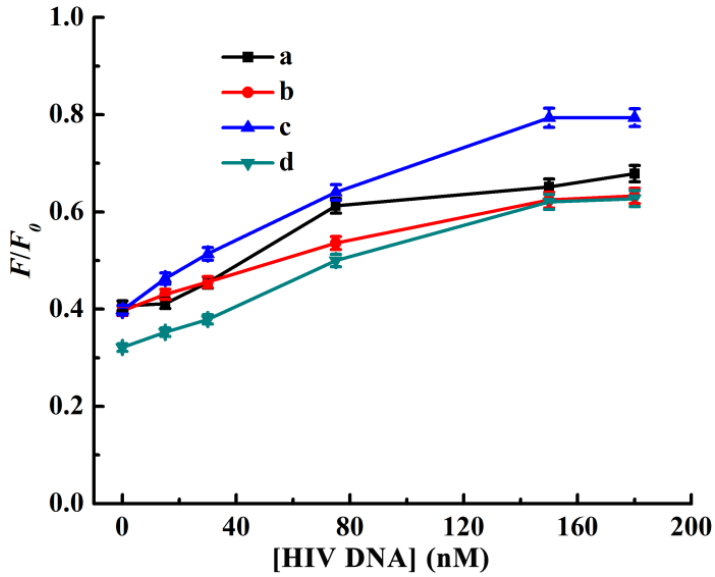


Figure S3. The fluorescence responses of S2-Ag NC (150 nM) to HIV DNA at different salt concentrations. The concentration of $CH_3COONa$ and $Mg(CH_3COO)_2$ in 10 mM PBS (pH 7.0): 25 mM + 2.5 mM (a), 50 mM + 5 mM (b), 75 mM + 7.5 mM (c), 100 mM + 10 mM (d). Other conditions were as same as Fig. S2.

4. Fluorescence excitation and emission spectra

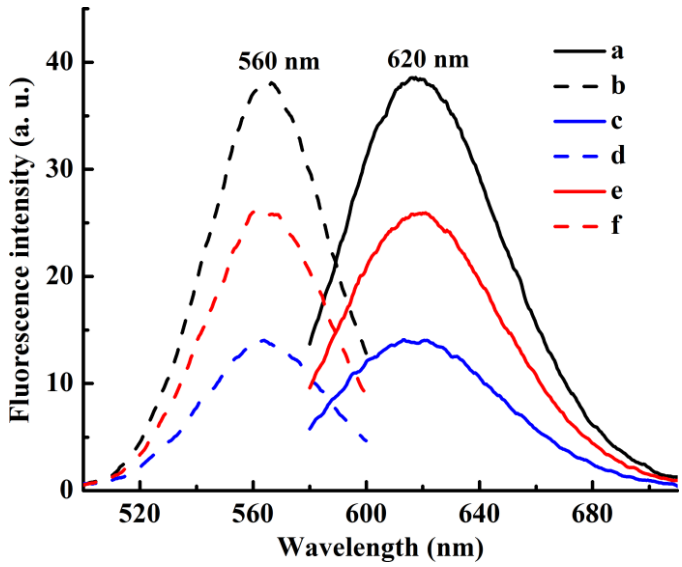


Figure S4. The fluorescence excitation (dash line) and emission (solid line) spectra of S2-Ag NC (a, b), S2-Ag NC/C1 (c, d), and S2-Ag NC/C1 + HIV DNA (e, f) in 10 mM PBS containing 75 mM $CH_3COONa$ and 7.5 mM $Mg(CH_3COO)_2$ (pH 7.2). The concentrations of all DNA were 300 nM.