Electronic Supplementary Material (ESI) for Molecular BioSystems


**Supporting Information**

# Reversible DNA-silver nanoclusters-based molecular fluorescence switch and its use for logic gate operation

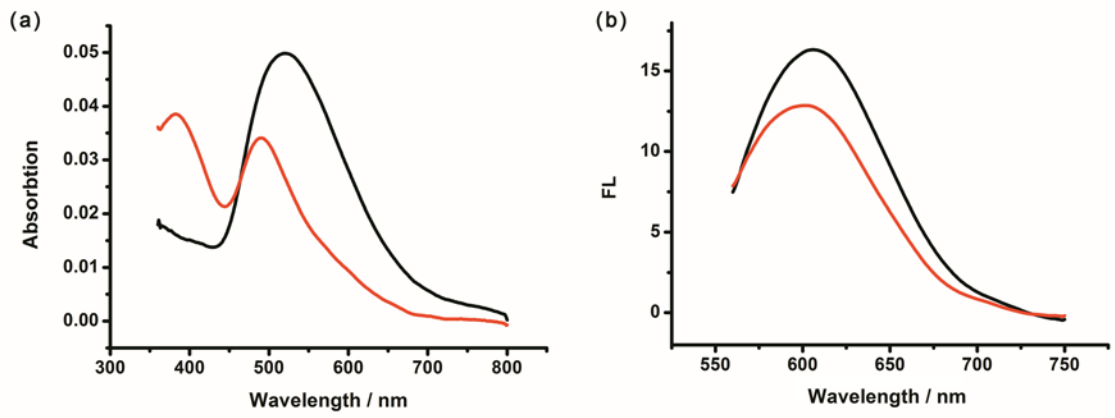


**Figure S1.** (a) Absorption spectra and (b) fluorescence emission spectra upon the excitation of 540 nm of PAA-templated AgNCs (black) and tr-DNA 1-AgNCs (red).

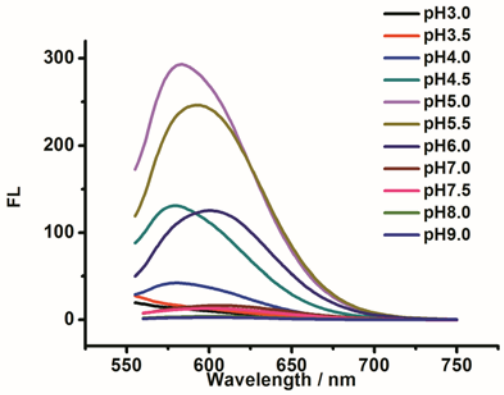


**Figure S2.** Fluorescence emission spectra of tr-DNA 1-AgNCs upon the excitation of 540nm at different pH conditions.

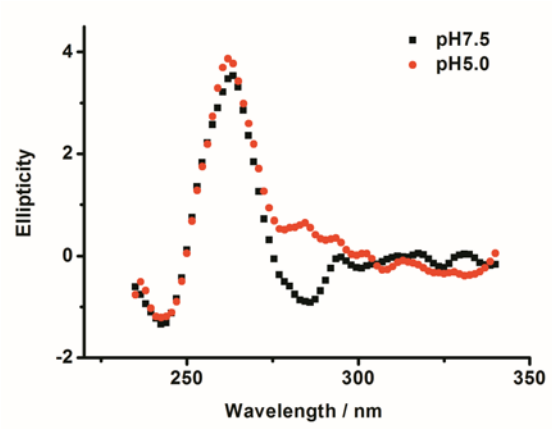


**Figure S3.** CD spectra of random DNA-AgNCs at pH 7.5 (black) and 5.0 (red), respectively. DNA sequence: dTATCCGTGGGGGACGGATA.

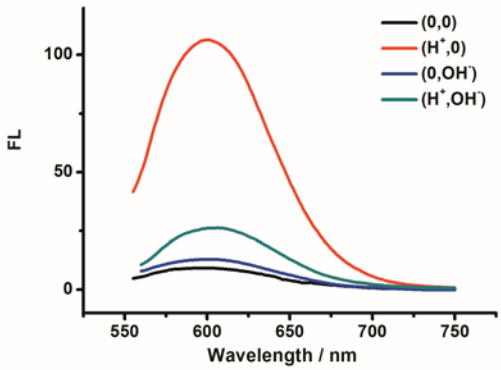


**Figure S4.** Fluorescent spectra of AgNCs-based molecular INHIBIT gate with different combinations of the input: no input (black line); INHIBIT -input-1($H^+$, red line, pH6.0); INHIBIT -input-2 ($OH^-$, blue line, pH8.0); INHIBIT -input-1 ($H^+$) and INHIBIT -input-2 ($OH^-$, green line) when excited at a wavelength of 540 nm.

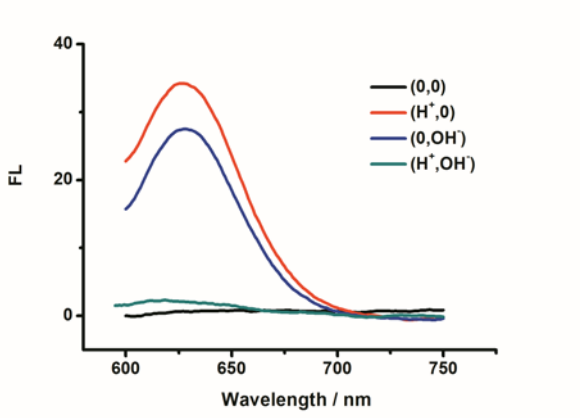


**Figure S5.** Fluorescent spectra of AgNCs-based XOR gate with different combinations of the input: no input (black line); XOR -input-1($H^+$, red line, pH5.0); XOR -input-2 ($OH^-$, blue line, pH9.0); XOR -input-1 ($H^+$) and XOR -input-2 ($OH^-$, green line) when excited at a wavelength of 580 nm.

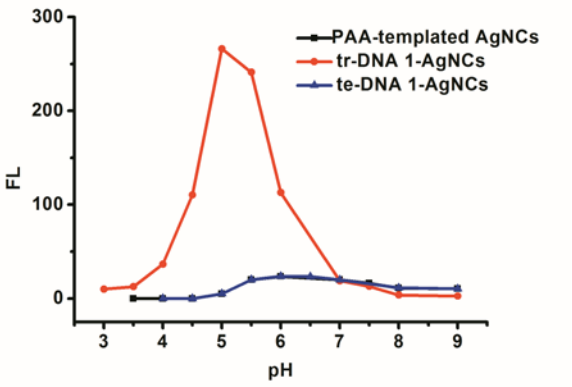


**Figure S6**. Fluorescence intensities at 601nm (540 nm excitation) of PAA-templated AgNCs, tr-DNA 1-AgNCs and te-DNA 1 -AgNCs as a function of pH.

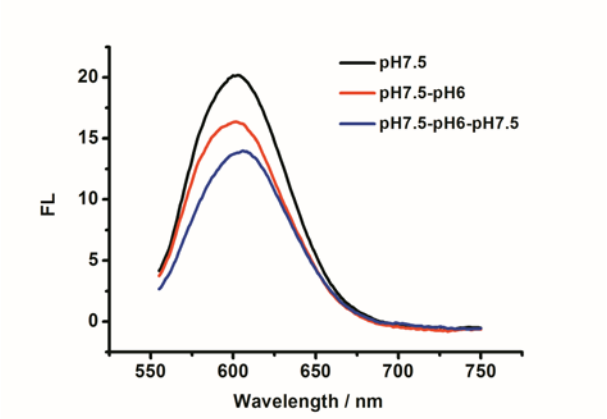


**Figure S7.** Irreversible change of fluorescence properties of te-DNA-1-AgNCs upon pH switching.