Supporting

A multi-DNA-Ag Nanocluster: Reassembly Mechanism and Sense the Change of HIF-1 in Cells

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Table S1 Sequence of DNA

Name	Sequence 5' — 3'
Template-DNA	CCTCCTTCCTCCCTACGTGCT
Target-DNA	AGCACGTAG

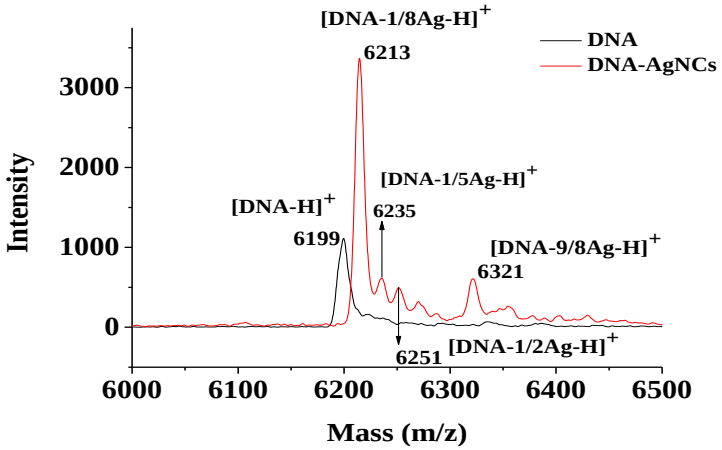

Fig. S1. ESI-MS spectra of DNA and DNA-AgNCs. The spectrometer was operated in a positive-ion mode. The structure of DNA-AgNCs was determined by ESI-MS measurement. The positive-mode ESI-MS spectra revealed one major peak for positively charged DNA, corresponding to m/z 6199. The most dominant peak of the DNA-AgNCs occurred at m/z 6213, assigned to the $[DNA\text{-}1/8Ag\text{-}H]^+$ anion, suggesting the presence of eight DNA strands at per Ag atom in this system. However, there are also several minor peaks at 6235, 6251, 6321, assigned to the $[DNA\text{-}1/5Ag\text{-}H]^+$, $[DNA\text{-}1/2Ag\text{-}H]^+$ and $[DNA\text{-}9/8Ag\text{-}H]^+$, respectively.

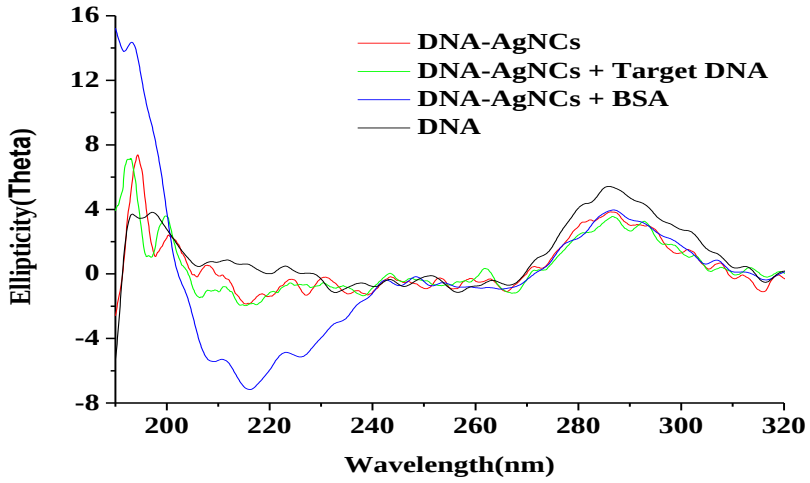

Fig. S2. CD spectra of DNA-Ag nanoclusters in 0.5 mM Citrate Buffer (pH 5.0): (black line) no Ag; (red line) DNA-AgNCs; (green line) DNA-AgNCs + Target-DNA; (blue line) DNA-AgNCs + BSA. Circular dichroism (CD) is a powerful technique for the study of DNA conformational changes.[1] As shown in the Fig.S2, the CD spectra of DNA have features at about 280 nm (+ ve ellipticity) and 245 nm (-ve ellipticity), which are specific spectra features for B-Form DNA. The formation of DNA-AgNCs makes the negative band change to around 210 nm, which is the characteristic band for A-Form DNA. It reveals that DNA changes from B-Form to A-Form after the Ag NCs formed. DNA strands rich in cytosine also generate quandruplexes.[1,2,3] The cytosine quadruplexes provide a characteristic CD spectrum with a dominant positive band at 290 nm.[4,5] This is why there is a dominant peak at 285 nm in the CD Spectra. The ellipticiy of the DNA-AgNCs at 285 nm was less than that of free DNA, revealing the DNA formed a folded structure that protected the AgNCs.[6] Our CD results confirm that the characteristic bands of DNA- AgNCs at 215 nm and 285 nm remain essentially unchanged when target-DNA are present in the solution, suggesting that the secondary structure of DNA is negligibly modified in the DNA-target DNA complex.

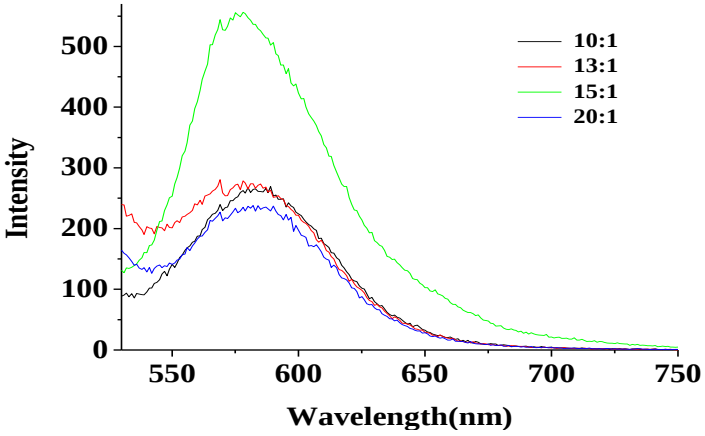

Fig. S3. The fluorescence emission spectra of DNA-AgNCs with different ratio of Ag^+ and DNA, when the ratio of DNA and Ag^+ is 1:15, a maximum fluorescent emission was shown.

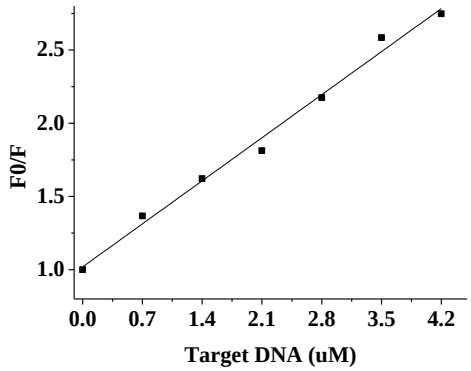

Fig. S4. Relationship of relative fluorescence intensity (F0/F) with varying target-DNA concentration. A linear equation between the value of F_0/F and the concentrations is $F_0/F=0.41997C_{T\text{-}DNA}+1.01902$.

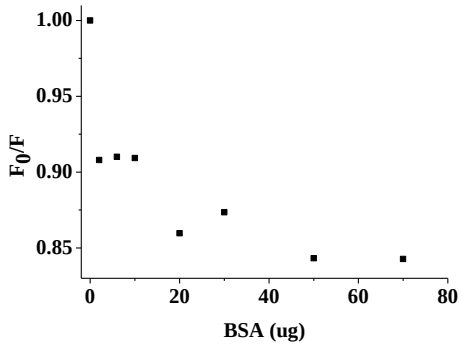

Fig. S5. Relationship of relative fluorescence intensity (F0/F) with varying BSA quantity. The value of F0/F changed irregularly as the addition of BSA.

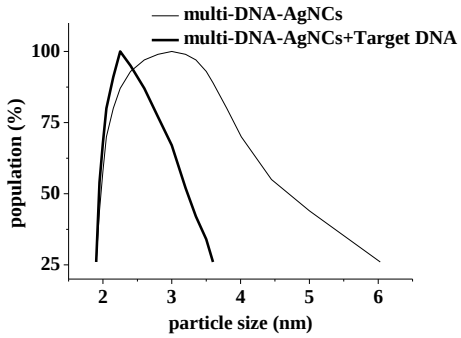

Fig. S6. Size distribution of silver nanoparticles in water.

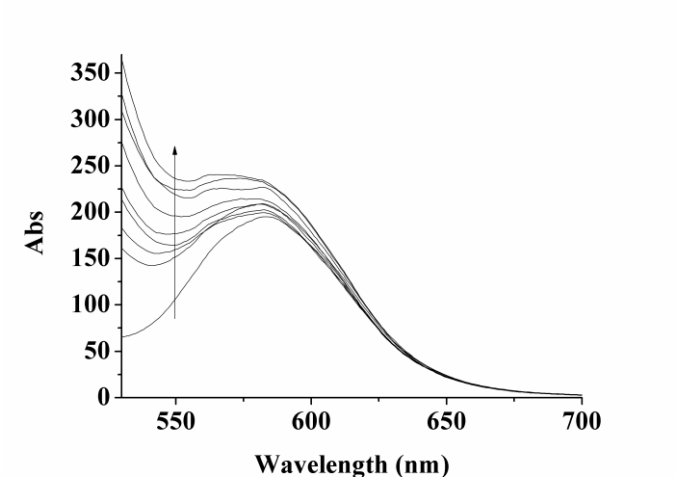

Fig. S7A. Emission spectra of fluorescence multi-DNA-AgNCs in the presence of ct-DNA (the concentration of ct-DNA from top: 0, 0.7, 2.0, 3.3, 6.7, 10, 16.7, 23.3, 36.7 ug/mL).

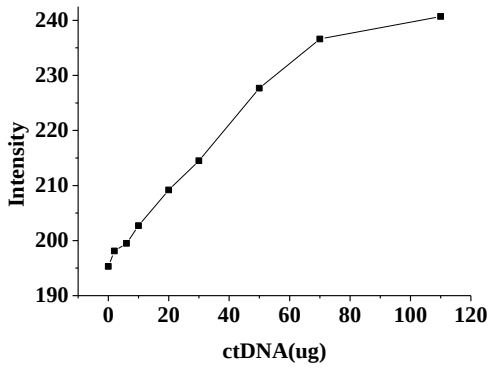

Fig. S7B. The relationship of relative fluorescence intensity (585 nm) of multi-DNA-AgNCs with varying ct-DNA quantity.

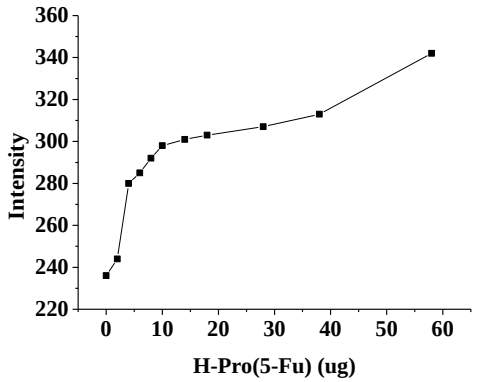

Fig. S8. The relationship of relative fluorescence intensity (585 nm) of multi-DNA-AgNCs with varying quantity of total protein from HepG-2 incubated with 5-Fu.

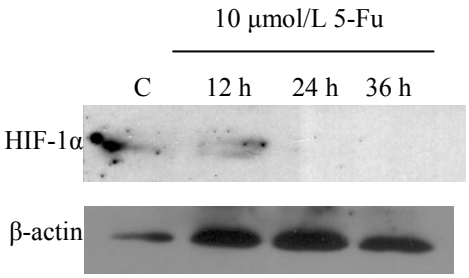

Fig. S9. The gel electrophores data of total protein from HepG-2 incubated with 5-Fu for 12, 24, 36h. The result showed that 5-Fu decreased the amount of HIF-1 in HepG-2 cells.

Reference:

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