Supplementary information

Enzymatic Polymerization-Activated Silver Nanoclusters Probe for *in Situ* Apoptosis Assay

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Table S1. DNA sequences used in this work.

Strand	DNA sequence (5'-3')
S1	CCCTTCCTTCCTTCCAACCAACCCCATGCTTTT TTTTTTTTTTTTTTTTTT
S2	AAAAAAAAAAAAAAAGCATG-BHQ
Random primer	CGCAATCCTGAGCACG

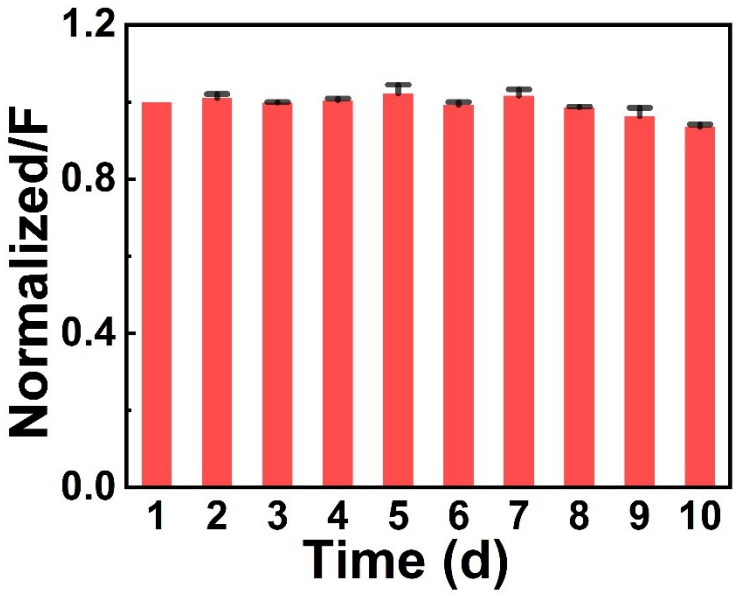

Figure S1. Normalized fluorescence intensity of the DNA/AgNCs after different days.

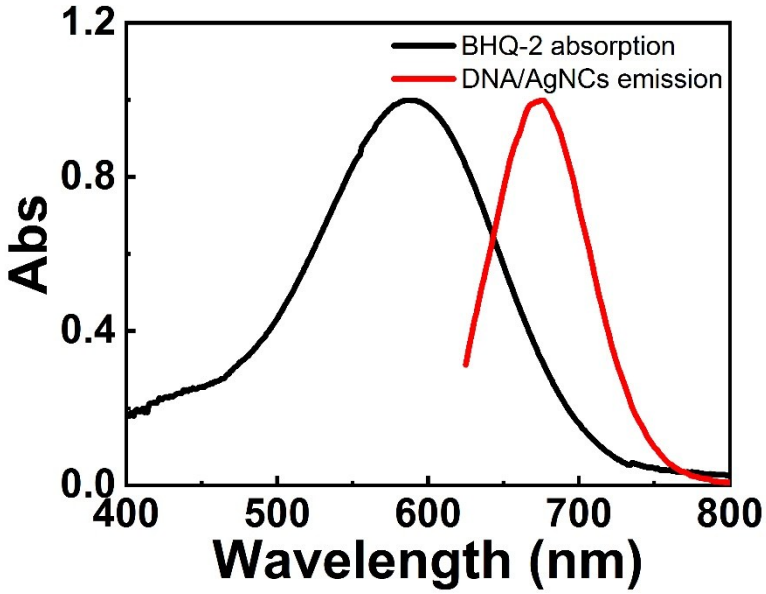

Figure S2. The absorption spectra of the quencher-BHQ, and the fluorescence spectra of the DNA/AgNCs.

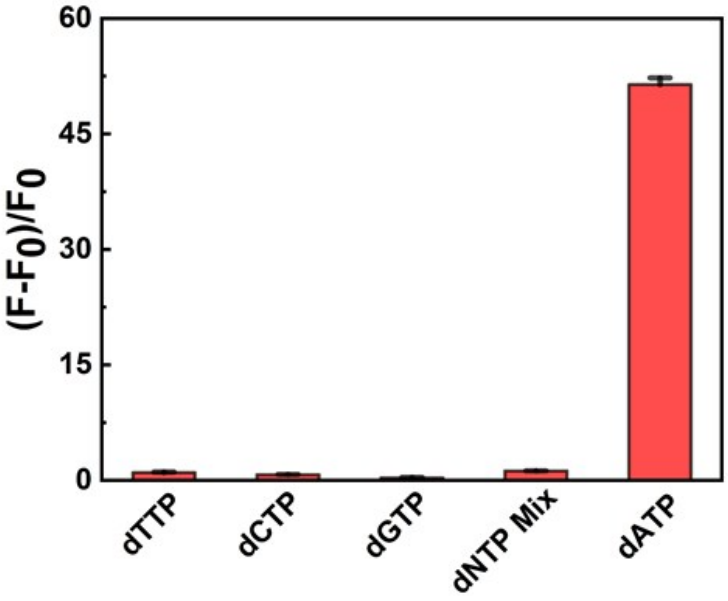

Figure S3. Fluorescence responses of the DNA/AgNCs probe toward different dNTP pool. F_0 and F correspond to the fluorescence intensity of DNA/AgNCs probe in the absence and presence of target DNAs, respectively. The concentrations of primer, dNTP and TdT are 50 nM, 100 μM and 40 U/mL, respectively.

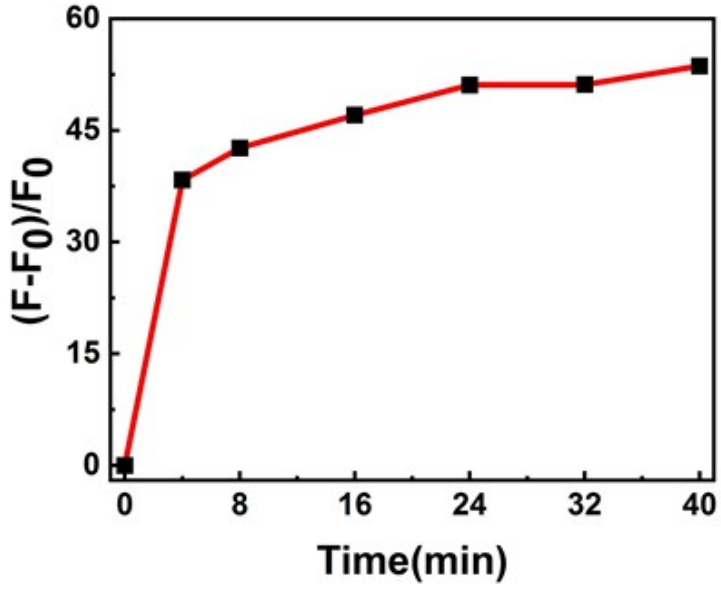

Figure S4. Time-dependent fluorescence response of the DNA/AgNCs probe to poly-dA chain. The concentrations of primer, dATP and TdT are 50 nM, 100 μM and 40 U/mL, respectively.

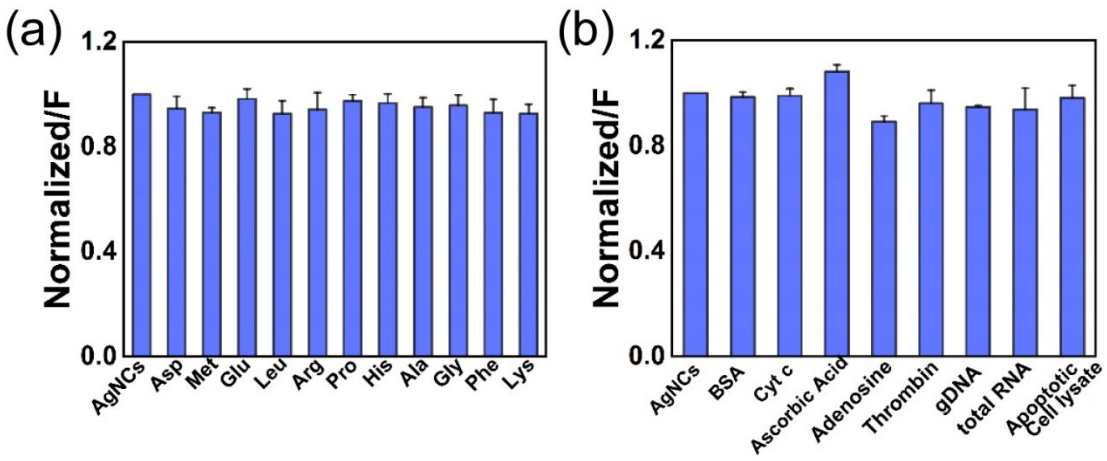

Figure S5. Normalized fluorescence intensity of the DNA/AgNCs in the presence of (a) various amino acids (Asp, Met, Glu, Leu, Arg, Pro, His, Ala, Gly, Phe, and Lys), and (b) other cellular molecules and biomacromolecules. The concentration of each amino acid is 0.1 mM. BSA, 0.1 mg/L; Cyt c, 1 μg/L; ascorbic acid, 1 mM; adenosine, 1 mM; thrombin, 2 U/mL; gDNA of 1×10^4 HepG2 cells; total RNA of 2×10^4 HepG2 cells; apoptotic cell lysates of 2×10^4 apoptotic HepG2 cells.

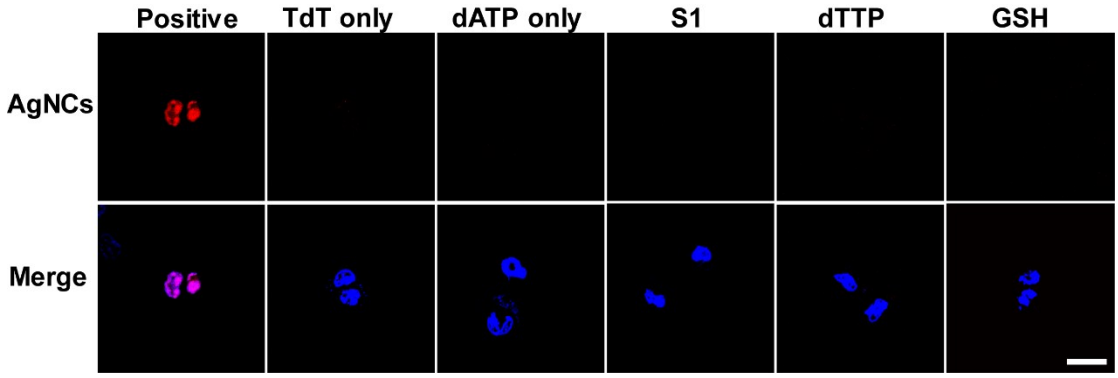

Figure S6. Imaging of STS-induced apoptotic cells by the DNA/AgNCs probe under different conditions: (1) TdT-mediated polymerization in the presence of dATP pool and TdT; (2) TdT only; (3) dATP pool only; (4) TdT-mediated polymerization in the presence of dATP pool and TdT, followed by incubation with S1 nuclease (10 U) for 2 h; (5) TdT-mediated polymerization in the presence of dTTP pool and TdT; (6) TdT-mediated polymerization in the presence of dATP pool and TdT, followed by addition of GSH (3 mM) for 10 min. The scale bar is 25 μm.

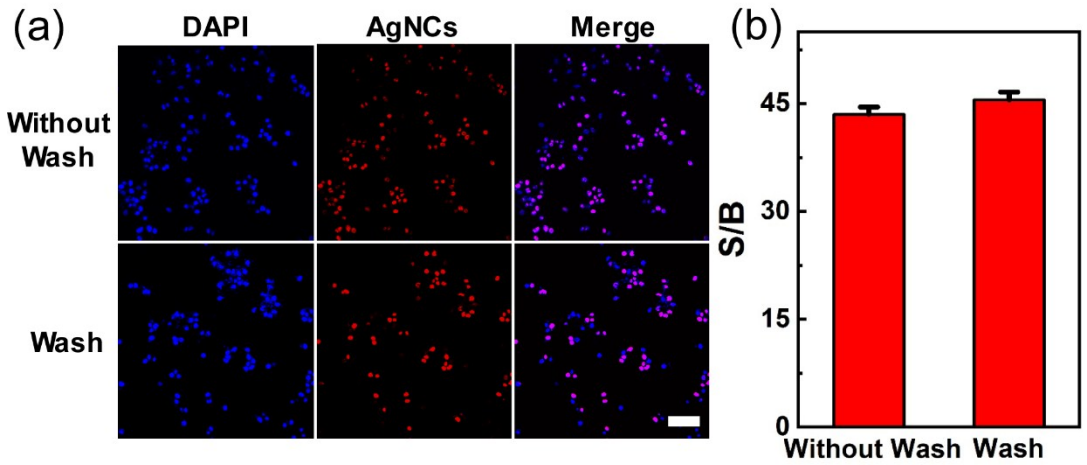

Figure S7. (a) Imaging of STS-induced apoptotic cells by the DNA/AgNCs-based assay with or without a washing step, the scale bar is 100 μm; and (b) the corresponding of signal-to-background ratios (S/B).

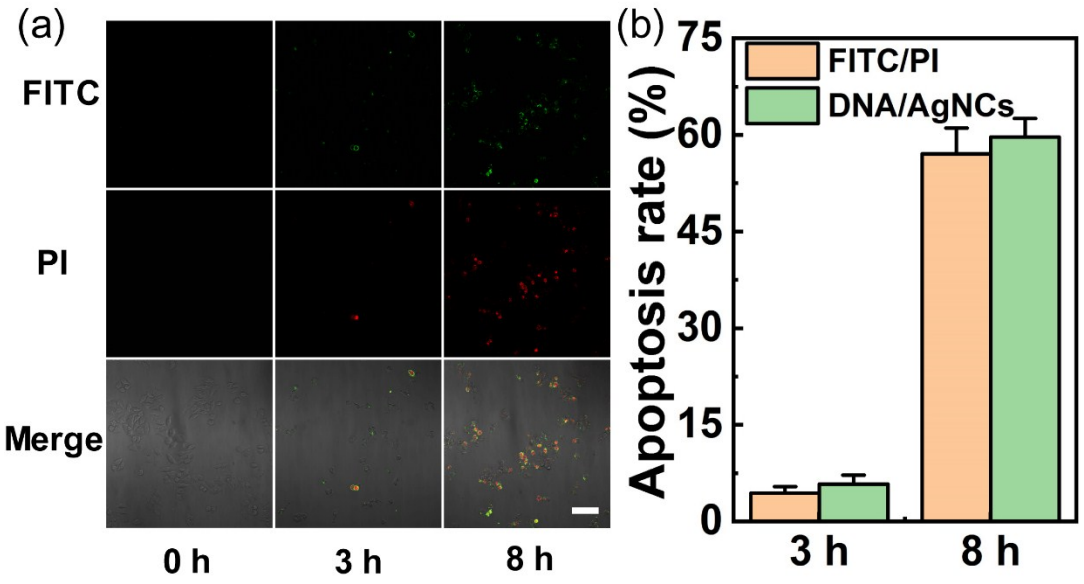

Figure S8. Detection of apoptotic cells using Annexin V-FITC/PI Apoptosis Analysis Kit. (a) HepG2 Cells were incubated with STS (1 μM) for 3 h and 8 h to induce apoptosis, and stained with Annexin V-FITC and PI. Representative CLSM images are shown, and the scale bar is 100 μm. (b) The rate of late apoptosis represents the percentage of FITC/PI double positive cells.