Electronic Supplementary Information

Label-free protamine-assisted colorimetric sensor for highly sensitive detection of S1 nuclease activity

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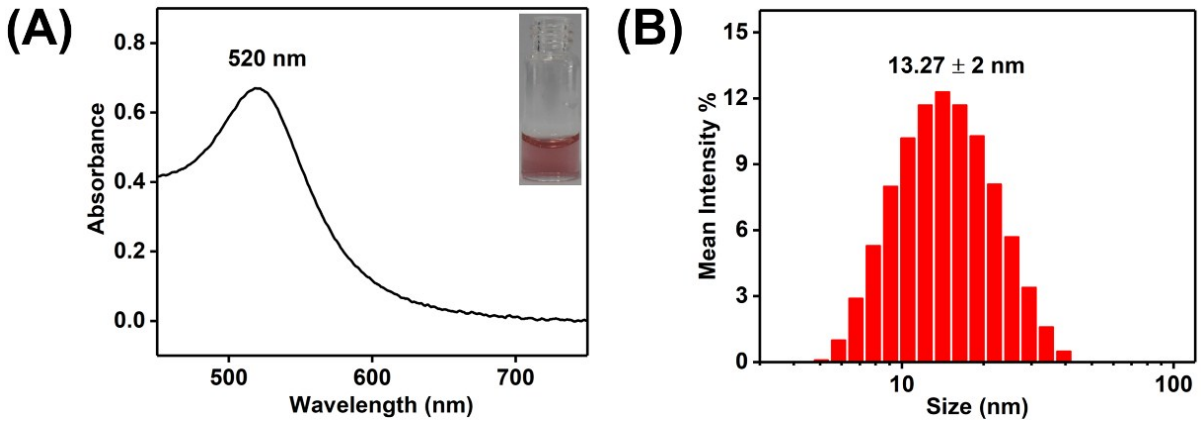

Fig. S1 (A) UV-Vis spectra and (B) dynamic light scattering distribution of AuNPs.

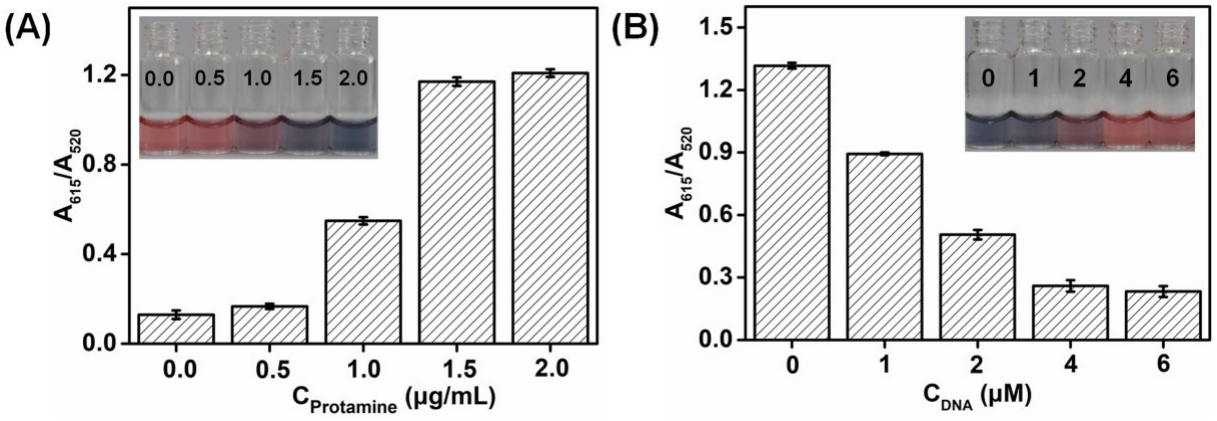

Fig. S2 (A) Effect of the concentration of protamine (from 0. 0 to 2.0 μg/mL) on the ratio of A_{615}/A_{520}. (B) Effect of the concentration of substrate DNA (from 0 to 6 μM) on the ratio of A_{615}/A_{520} in the presence of 1.5 μg/mL of protamine. The error bars represent standard deviations from five parallel measurements.

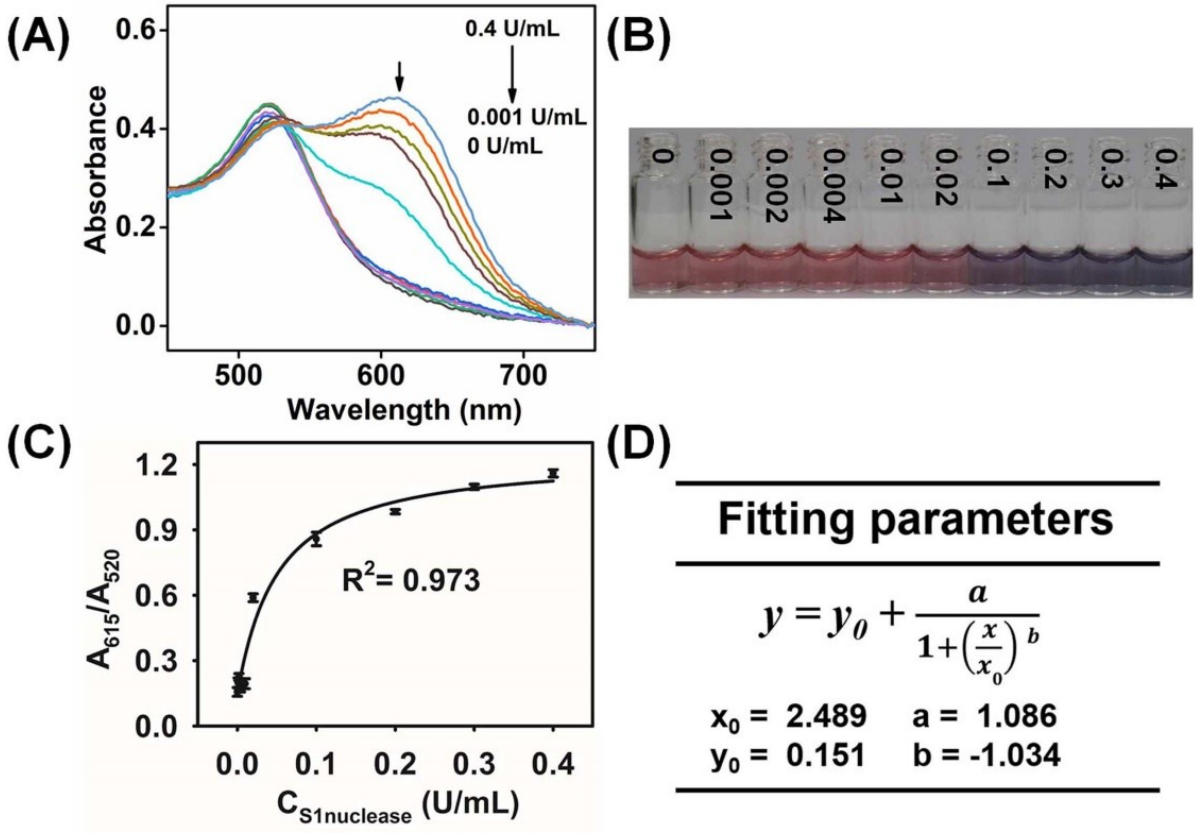

Fig. S3 (A) UV-Vis absorption spectra and (B) photograph images of the system upon incubation with different concentrations of S1 nuclease in serum matrix (from left to right: 0, 0.001, 0.002, 0.004, 0.01, 0.02, 0.1, 0.2, 0.3 and 0.4 U/mL). (C) Corresponding calibration curves for S1 nuclease in serum matrix. The error bars indicate standard deviations of five measurements. (D) Four-parameter logistic function for the fitting line.

Table S1 Comparison of the detection limits, linear range, reaction times of various detection methods for S1 nuclease.

Method	Technique in detail	Detection limit (U/mL)	Linear range (U/mL)	Reaction time (min)	Ref.
Electrochemistry	Label-free potentiometric method based on a polycation-sensitive membrane electrode	0.27	—	20	1
Fluorescence	Copper nanoparticles as fluorescent probe	0.3	1-50	35	2
	WS2 nanosheet as an effective fluorescence sensing platform	0.01	0.05-3	30	3
	MnO_2 nanosheet-based Fluorescence sensing platform	0.05	0-20	50	4
	Hairpin loop-enhanced fluorenscent copper nanoclusters	0.003	0.005-0.08	60	5
Colorimetric	A G-quadruplex-based colorimetric assay	0.014	0.03-5	60	6
	Using positively-charged gold nanoparticles as colorimetric probes	—	0-30	30	7
	Engineering oligonucleotide-based peroxidase mimetics for colorimetric assay	0.0047	0-0.1	30	8
	Label-free protamine-assisted colorimetric sensor	0.0001	0-0.4	20	This work

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