Electronic Supplementary Material (ESI) for Analyst.

Supplementary materials

Dual Signal Amplification Strategy for High-Sensitive Fluorescence Detection of Nucleic Acids

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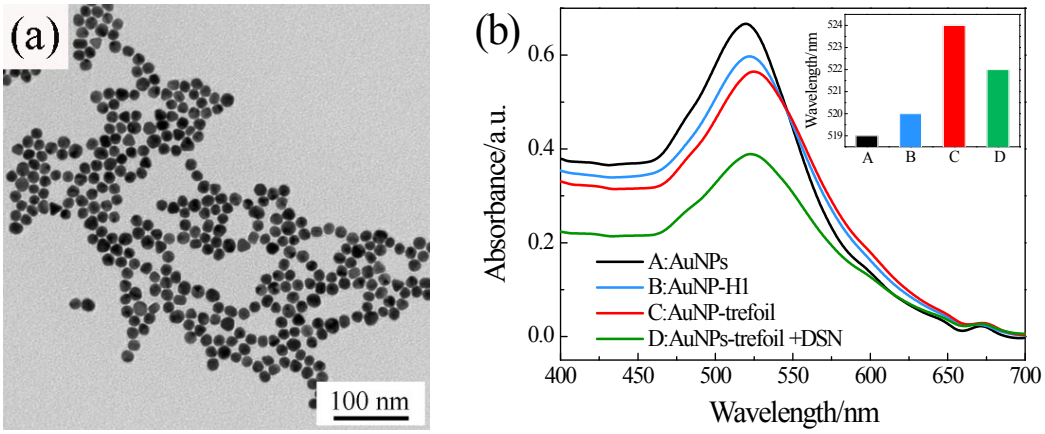

Fig. S1 Characterizations of the AuNP-H1 probes and the sensing strategy. (a) TEM image. (b) Absorption spectra of AuNPs, AuNPs-H1, AuNP-trefoil, and AuNP-trefoil incubated with DSN (AuNP-trefoil+DSN).

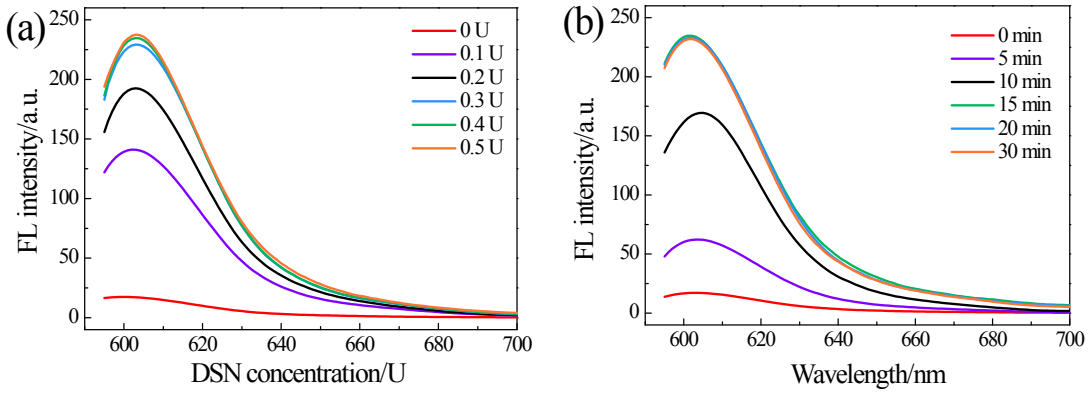

Fig. S2 Optimizations of MCH blocking and DSN incubation. (a) Fluorescence spectra of the assays of 1 nM T by using 0, 0.1, 0.2, 0.3, 0.4, and 0.5 U DSN. (b) Fluorescence spectra of the assays of 1 nM T by using 0.3 U DSN with different incubation times, i.e. 0, 5, 10, 15, 20, 25, and 30 min.

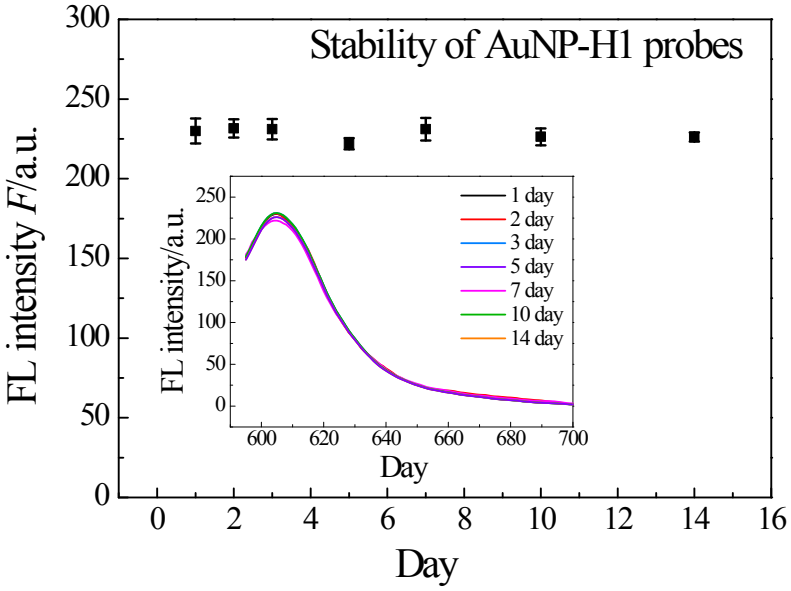

Fig. S3 Fluorescence characterization of the storage stability of AuNP-H1 probes by plotting the fluorescence peak intensity of the AuNP-H1 after aging for 1, 2, 3, 5, 7, 10, and 14 days. The inset shows the corresponding fluorescence spectra.

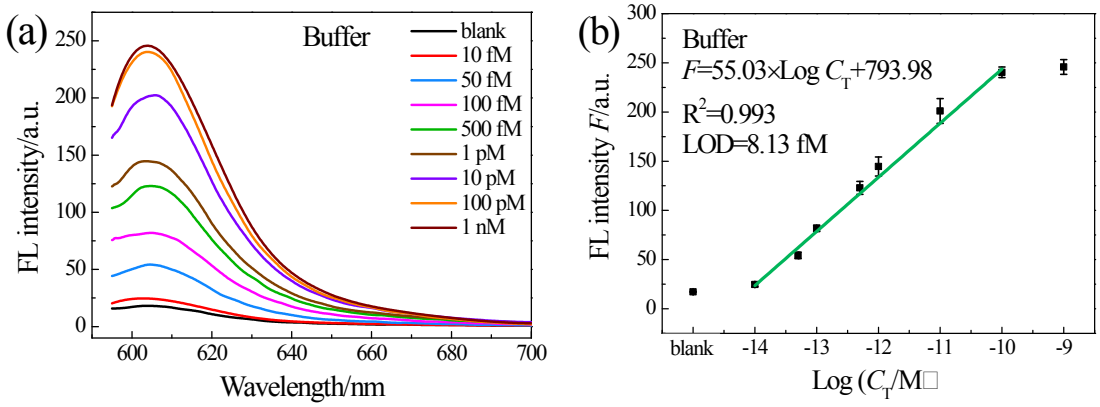

Fig. S4 (a) Fluorescence spectra of the concentration-dependent assay of target DNA in PBS with the concentration from 0 (blank) to 1 nM. (b) Plots of the concentration-dependent fluorescence peak intensities corresponding to the spectra shown in (a), and a linear calibration curve fitted from 10 fM to 100 pM. Error bars represent standard deviations from three measurements.

Table S1. A summary of some reported fluorescence assays of nucleic acids by utilizing other signal amplification strategies.

Amplification strategy	Target	Detection range	LOD	Ref
DSN	miRNA-141	100 pM-100 nM	100 fM	1
	miRNA-21	1 pM-1 nM	300 fM	2
RCA	miRNA-21	0.2-60 nM	65 pM	3
HCR	mRNA	1 pM-1 nM	0.5 pM	4
CHA and DNAzyme	miRNA-21	10 pM -50 nM	10 pM	5
CHA and HCR	miRNA-21	10 pM-500 pM	2 pM	6
Target-triggered amplification recycling and DSN	DNA	50 fM-5 pM	44.66 fM	**This work**

Abbreviations: LOD = limit of detection; DSN = Duplex-specific nuclease; RCA = rolling circle amplification; HCR = hybridization chain reaction; CHA = catalyzed hairpin assembly.

Reference

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