Electronic Supplementary Material (ESI) for Analyst.

Electronic Supplementary Information

A versatile proximity-dependent probe based on light-up DNA-scaffolded silver nanoclusters

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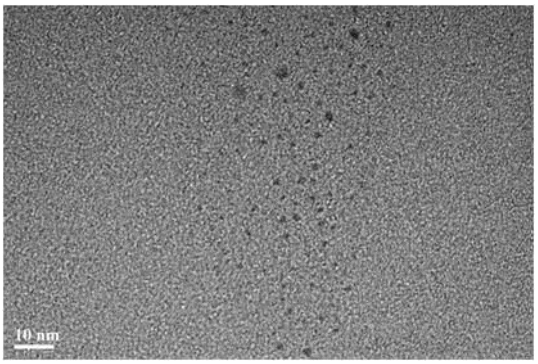

Fig. S1 TEM images of AgNCs scaffolded by Probe 1 after adding Zr^{4+}.

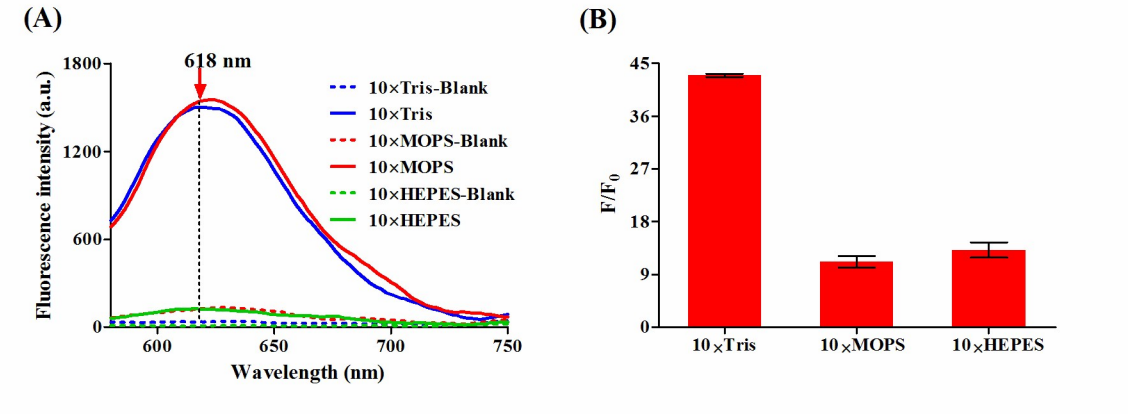

Fig. S2 Selection of the reaction buffer for Zr^{4+} detection by comparing fluorescence intensity of the reaction system performed among three tested reaction buffers in the absence and presence of Zr^{4+}. The reaction buffers used in DNA/AgNCs synthesis are as follows: 10×Tris buffer (200 mM Tris, 500 mM $NaNO_3$, pH 7.4), 10×MOPS (500 mM $NaNO_3$, 200 mM MOPS, pH 7.0), 10×HEPES (100 mM HEPES, 500 mM $NaNO_3$, pH 7.4). The error bars were calculated from three independent experiments.

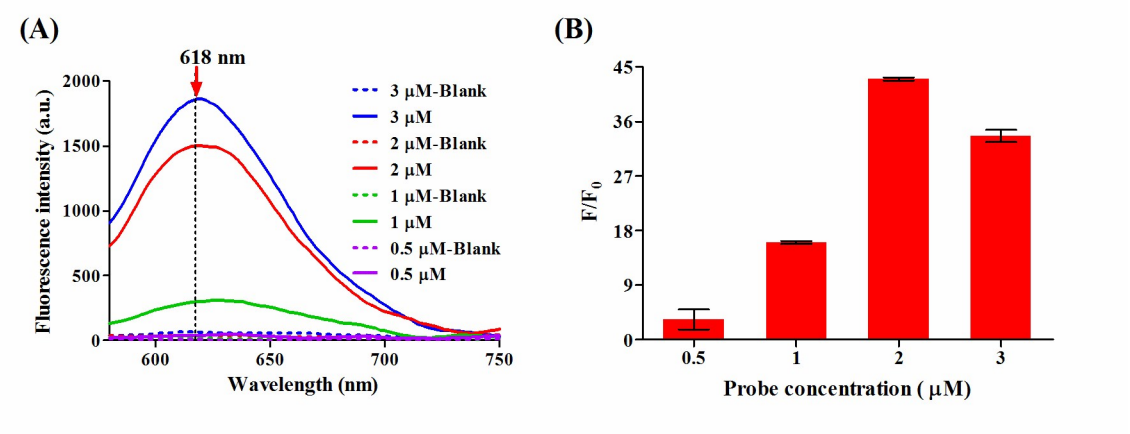

Fig. S3 Selection of probe concentration used. (A) Fluorescence emission spectral responses to the different concentration of probe in the absence and the presence of Zr^{4+}. (B) Bar graph of fluorescence ratio (F/F_0) responses to the different concentration of probe. F and F_0 are the fluorescence intensities at a peak value of 618 nm in the presence and absence of Zr^{4+}, respectively. The error bars were calculated from three independent experiments.

Table S1. Recovery results of spiked Zr^{4+} in river water at four concentrations

Spiked amount (μM)	Detected amount (μM)	Recovery (%)	CV (%)
100	92.62	92.62	3.92
50.0	49.56	99.12	5.92
40.0	39.07	97.67	2.06
30.0	29.38	97.95	7.61

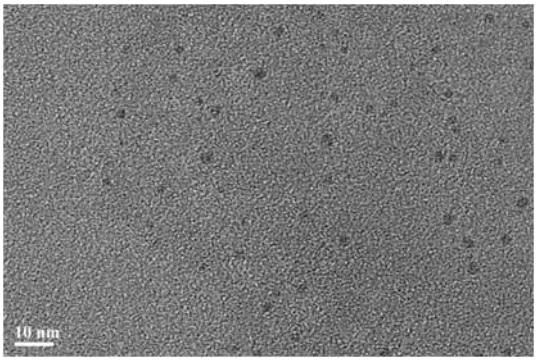

Fig. S4 TEM images of AgNCs scaffolded by the mixture of Probe 4 and Probe 5 after adding T1.

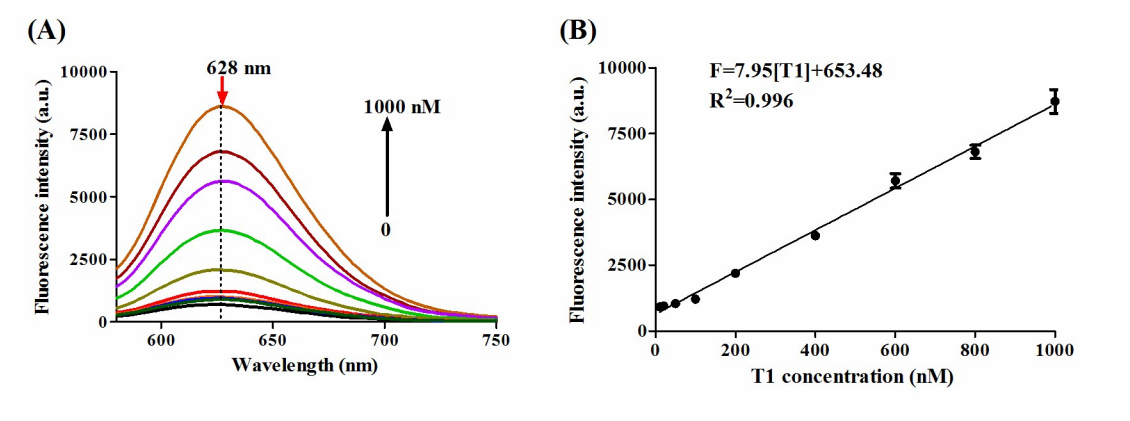

Fig. S5 Sensitivity investigation for specific detection of target DNA (T1). (A) Fluorescence emission spectra for excitation at 560 nm in the presence of T1 at different concentrations (0, 10, 20, 50, 100, 200, 400, 600, 800 and 1000 nM) by the proposed method. (B) A plot of the linear relationship between the fluorescence intensity at the peak value of 628 nm and T1 concentration.

Table S2. Recovery results of spiked DNA in serum at four concentrations

Spiked amount (nM)	Detected amount (nM)	Recovery (%)	CV (%)
1000.0	1014.66	101.47	2.58
600.0	602.52	100.42	1.49
200.0	199.00	99.50	4.60
50	44.85	89.70	9.52

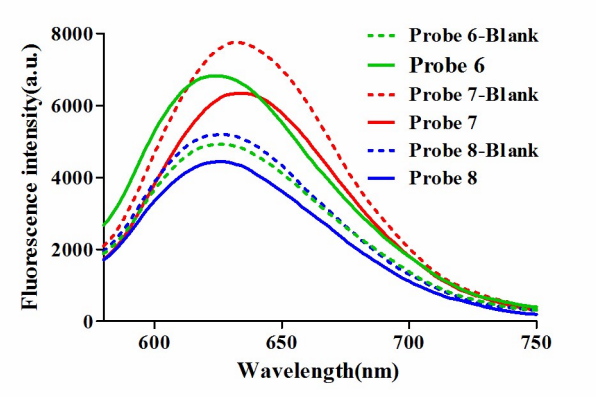

Fig. S6 Selection of probe used in the proposed method for detection of ATP.

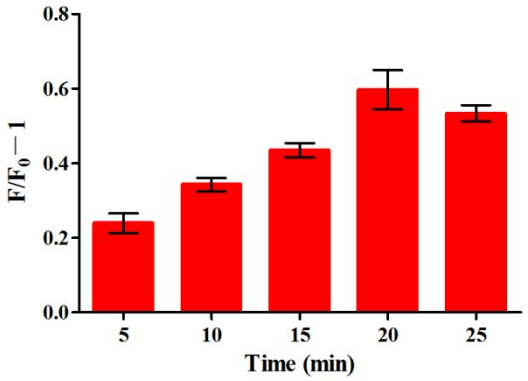

Fig. S7 Time-dependent (F/F_0-1) value of the proposed method after adding 2 mM ATP, where F and F_0 are the fluorescence intensities at 630 nm in the presence and absence of tested target, respectively.

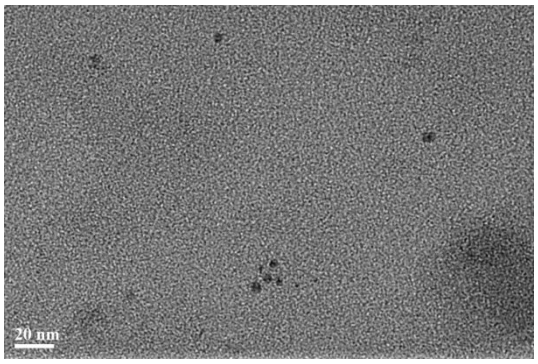

Fig. S8 TEM images of AgNCs scaffolded by Probe 6 after adding ATP.

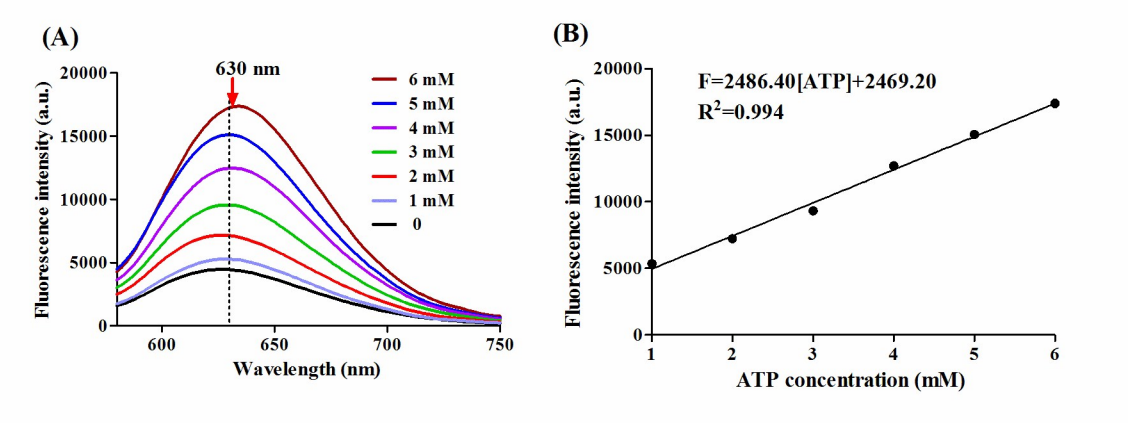

Fig. S9 Sensitivity investigation for ATP detection. (A) Fluorescence emission spectra for excitation at 560 nm in the presence of ATP at different concentrations (0, 1, 2, 3, 4, 5, and 6 mM) by the proposed method. (B) A plot of the linear relationship between the fluorescence intensity at the peak value of 630 nm and ATP concentration.

Table S3. Recovery results of spiked ATP in serum at three concentrations

Spiked amount (mM)	Detected amount (mM)	Recovery (%)	CV (%)
6.0	5.89	98.17	2.04
4.0	4.13	103.25	3.56
2.0	2.16	108.00	8.35

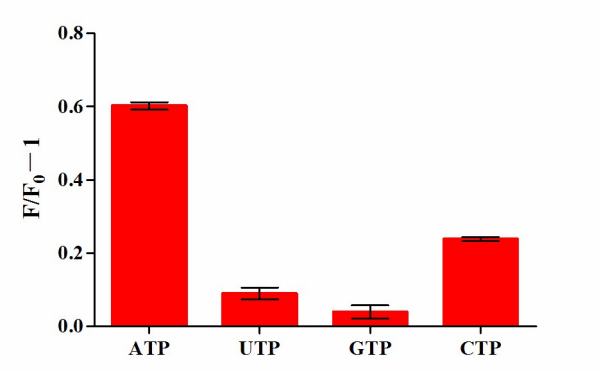

Fig. S10 Selectivity analysis for ATP detection. Bars represent the fluorescence ratio (F/F_0-1) in respond to ATP, UTP, GTP and CTP with 2 mM, where F and F_0 are the fluorescence intensities at 630 nm in the presence and absence of tested target, respectively.