Supplementary Information

A Simple Lateral Flow Biosensor for the Rapid Detection of Copper (II) Ion Based on Click Chemistry

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Table S1 Sequences of the DNA used in this study

Name	Sequence (5'→3')
Azide-DNA	ATACTCCCCCAGGTGCCG
Alkyne/biotin-DNA	AGCTTCTTTCTAATACG
Control zone-DNA	CGTATTAGAAAGAAGCTCGTATTAGAAAGAAGCT
Test zone-DNA	CGGCACCTGGGGGAGTATCGGCACCTGGGGGAGTAT

Table S2 Measurements of Cu^{2+} spiked in tap water and human serum

Samples	Cu^{2+}(μM) (n=3)		Recovery (%)
	spiked	detected	
Tap water	2	1.92 ± 0.09	91.3%
	20	22.8 ± 0.79	109.3%
	200	190.4 ± 1.92	95.2%
Human serum	2	1.91 ± 0.12	95.5%
	20	19.2 ± 1.09	96%
	200	208.4 ± 1.92	104.2%

Table S3 Assessment of repeatability and reproducibility of the biosensor

researcher	optical intensity					CV
1	924	830	832	917	869	4.06%
	895	827	842	859	912	
	920	816	832	891	870	
2	830	920	811	870	845	4.38%
	823	831	865	841	851	
	921	890	845	835	824	
CV	4.23%					

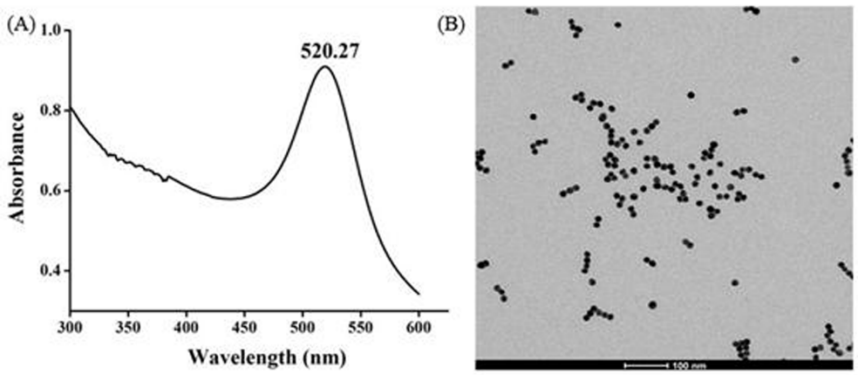

Fig. S1 (A) The UV absorption spectrum and (B) TEM photographs of AuNPs used in the experiment. Scale bars are 100 nm.

	1	2	3	4	5	6	7	8	9
Azide DNA	2 uM	2 uM	2 uM	2 uM	2 uM	2 uM	2 uM	2 uM	2 uM
Cu^{2+}	0	200 uM	200 uM	200 uM	200 uM	200 uM	0	0	0
VC	0	500 uM	500 uM	500 uM	500 uM	500 uM	0	0	0
H_2O_2	0	0	200 uM	500 uM	1 mM	2 mM	500 uM	1 mM	2 mM

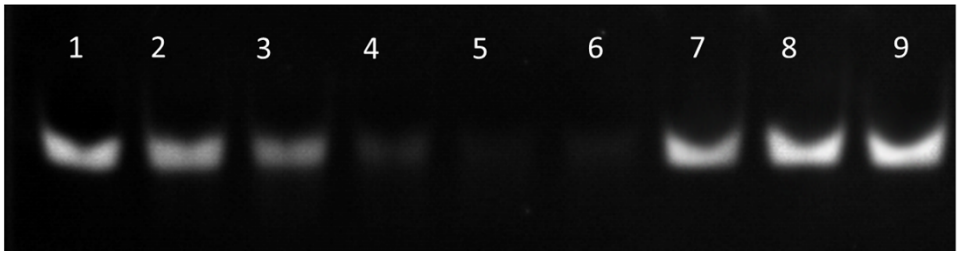

Fig. S2 PAGE of the azide-DNA under different concentrations of Cu^{2+}, sodium ascorbate and H_2O_2.and ligation product. We designed an experiment to measure the DNA scission. We treated the azide-DNA with different concentrations of Cu^{2+}, sodium ascorbate and H_2O_2 and ran on PAGE. When only 200μM Cu^{2+}/500μM sodium ascorbate were added to 2μM azide-DNA, no extensive DNA degradation occurred, the same thing happen when only H_2O_2 was added even at a high concentration of 2 mM. But when 200μM Cu^{2+}/500μM sodium ascorbate was mixed with different concentrations of H_2O_2, DNA degradation occurred, and with the increase of H_2O_2, DNA degradation increased. In our method, no extra H_20_2 was added, so there was not so much H_2O_2 produced by the reaction of ascorbate acid and Cu^{2+}. Therefore no extensive DNA degradation occurred.

	1	2	3
Alkyne DNA	2 uM	2 uM	2 uM
Cu^{2+}	0	200 uM	200 uM
VC	0	500 uM	500 uM
H_2O_2	0	0	500 uM

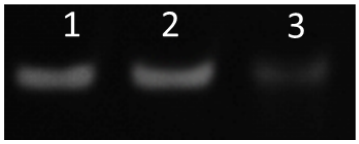

Fig. S3 PAGE of the alkyne-DNA under different concentrations of Cu^{2+}, sodium ascorbate and H_2O_2.