Supporting Information for

Enzyme-Mediated Competitive Colorimetric Sensor Based on Au@Ag Bimetallic Nanoparticles for Highly Sensitive Detection of Disease Biomarkers

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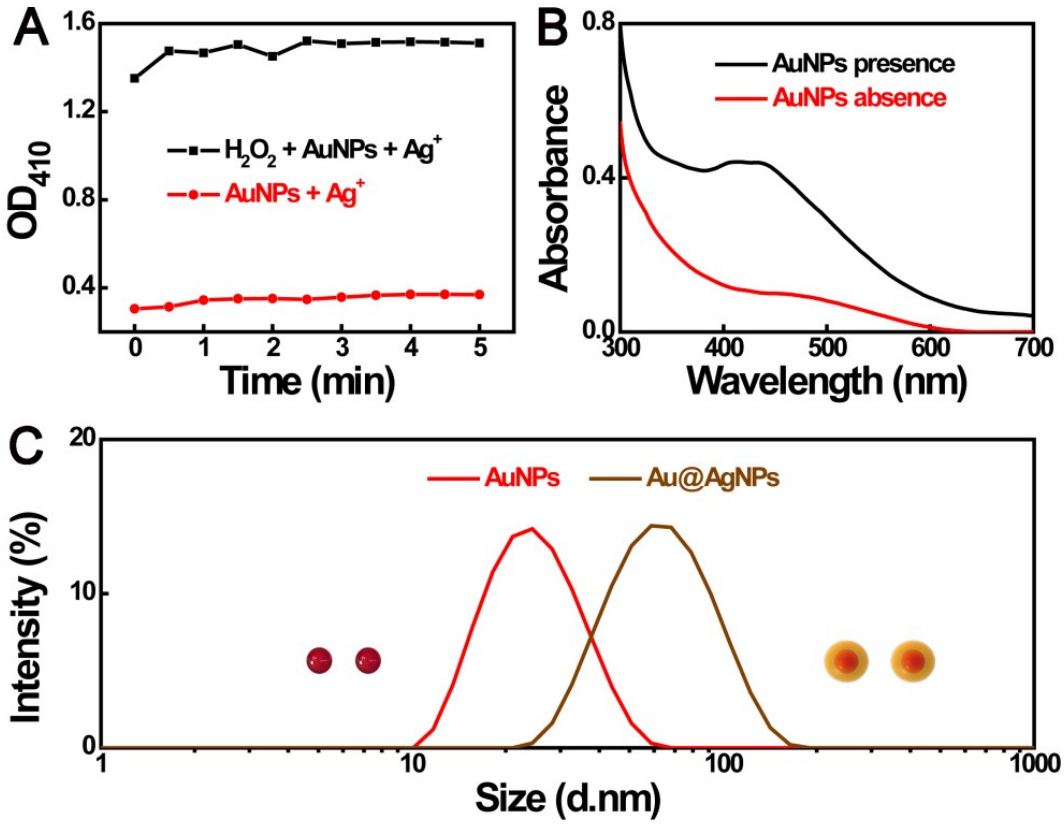

Fig. S1 (A) Time-dependent plots of absorption intensity at 410 nm of AuNPs/Ag^+ solution in the presence and absence of 0.1 mM H_2O_2. (B) Absorption spectra in the presence or absence of AuNPs in the Tollens' reagent solution which containing 0.05 mM H_2O_2 and 2.4 mM [Ag^+]. (C) DLS analysis of AuNPs and Au@AgNPs.

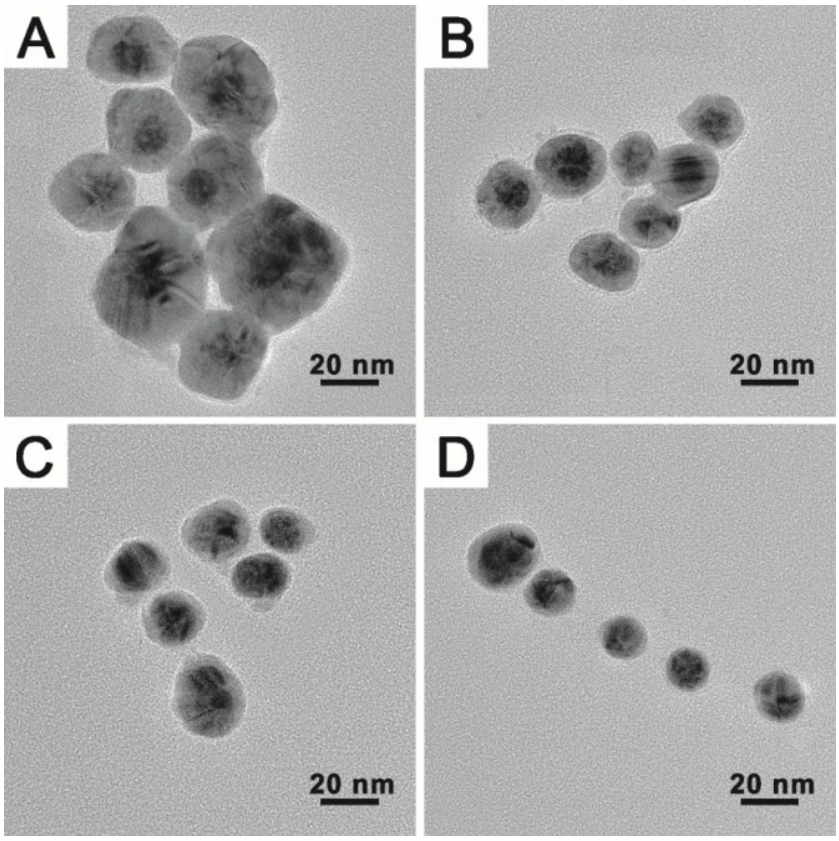

Fig. S2 The relationship between the size of Au@AgNPs and different concentrations of H_2O_2. The concentration of H_2O_2 is 10 mM, 1.25 mM, 0.65 mM and 0.02 mM for A, B, C and D respectively.

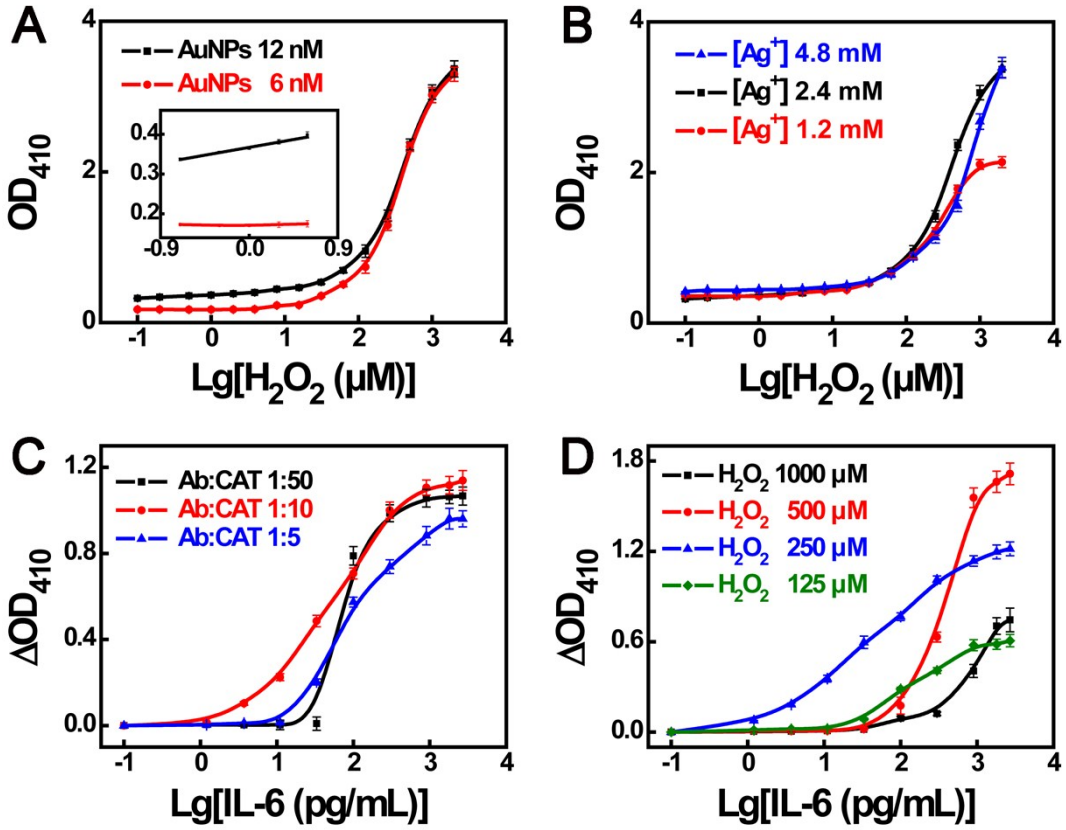

Fig. S3 Optimization of conditions of Au@Ag nanosensor for response of H_2O_2 and detection of IL-6. (A) The effect of the concentration of AuNPs for response of H_2O_2. (B) The effect of the concentration of Ag^+ for response of H_2O_2. (C) The molar ratio of Ab/CAT on the surface of PS for detection of IL-6. (D) The effect of H_2O_2 concentration for detection of IL-6.

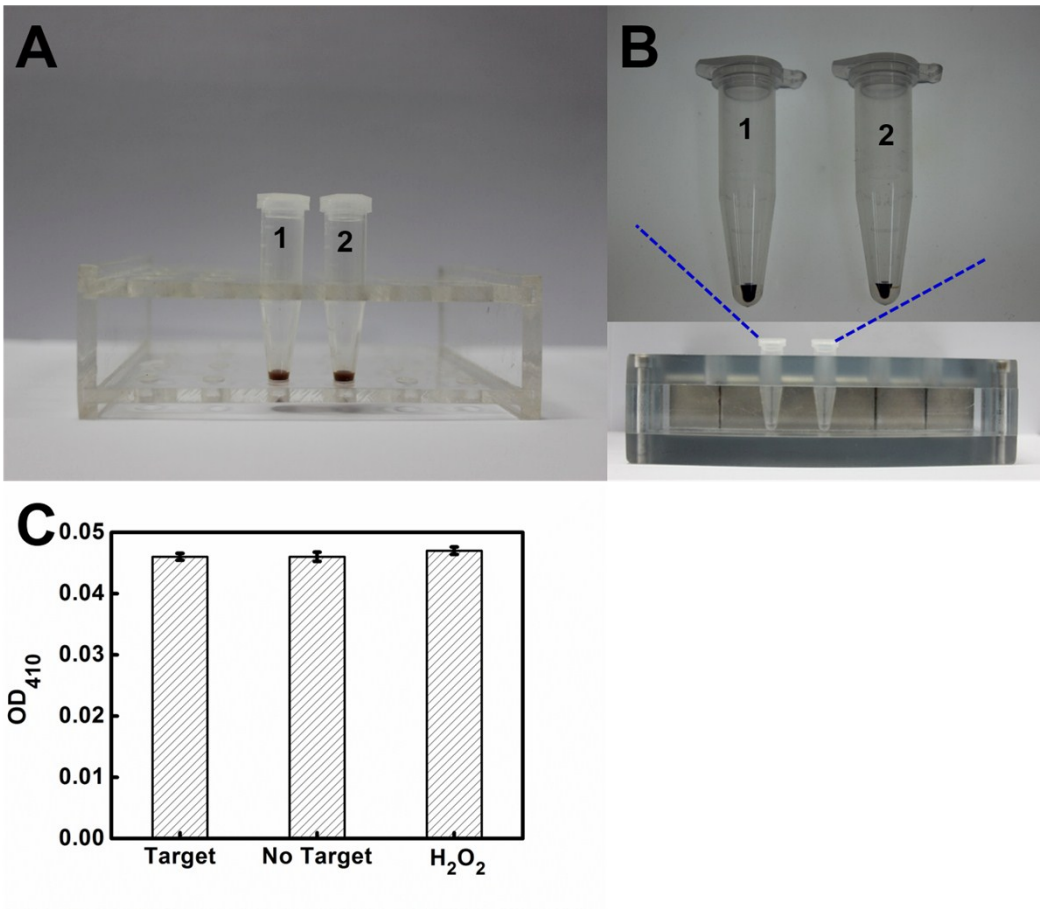

Fig. S4 (A) Photos of mixtures containing MBs-Ab1, CAT-PS-Ab2 and H_2O_2 in the absence and presence of target before magnetic separation (centrifuge tube 1: presence of target, centrifuge tube 2: absence of target). (B) Photos of mixtures containing MBs-Ab1, CAT-PS-Ab2 and H_2O_2 in the absence and presence of target after magnetic separation. (C) Optical density at 410 nm of the supernatant form the mixtures containing MBs-Ab1, CAT-PS-Ab2 and H_2O_2 in the absence and presence of target after magnetic separation.

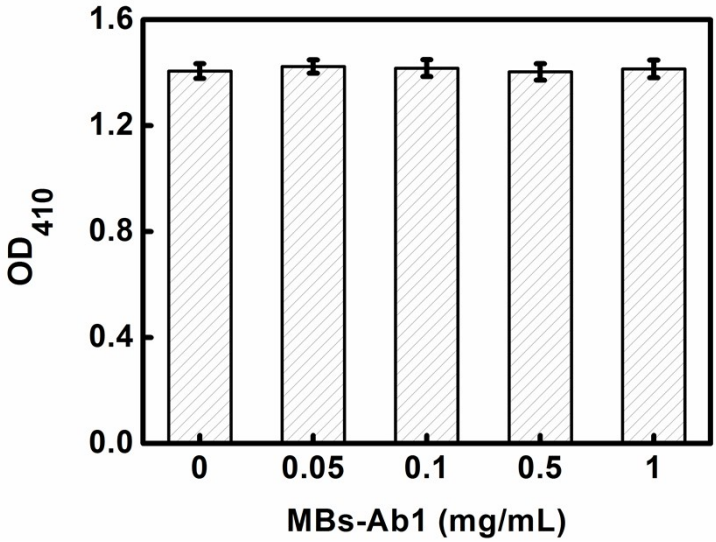

Fig. S5. Optical density at 410 nm of the mixtures of AuNPs (12nM, 20 μL) and Ag^+ (160 μL 2.4 mM) after the addition of H_2O_2 (20 μL) of MBs-treated H_2O_2

Table S1. The results of Au@Ag nanosensor for the detection of IL-6 in serum sample and its comparison with Roche-ECL (n=3).

Sample No.	Au@Ag nanosensor (pg/mL)	Roche-ECL (pg/mL)	CV (%)
1	22.59±0.72	26.4±2.4	14.43
2	4.15±0.45	4.83±0.25	14.07
3	88.19±4.67	69.46±3.3	26.97
4	18.82±0.32	22.4±0.65	15.98
5	15.35±0.37	15.03±0.66	2.13
6	78.79±4.17	89.3±1.08	11.77
7	8.87±0.46	7.56±0.45	17.33
8	26.08±0.81	30.5±0.76	14.49
9	14.31±0.27	12.23±0.4	17.07
10	10.28±0.34	9.1±0.2	12.97
11	13.39±0.25	15.03±0.4	10.91
12	9.89±0.38	11.73±0.55	15.69
13	45.53±1.55	57.8±3.1	21.23
14	62.28±2.11	51.9±3.4	20.00
15	17.36±0.38	13.83±0.65	25.52
16	---	3.76±0.55	---