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Electronic Supplementary Information

A sensitive colorimetric detection for lysozyme based on the capture of fixed thiol-aptamer on gold nanoparticles

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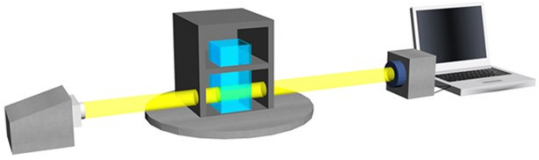

Fig. S1. Schematic diagram of custom-made absorption spectroscopy. From left to right: tungsten halogen lamp, cuvette, spectrometer and computer.

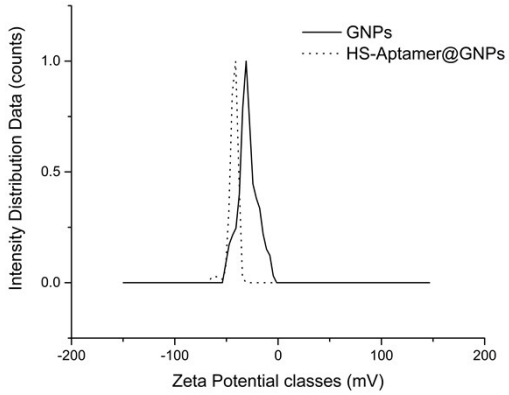

Fig. S2. Normalized zeta potential of GNPs (solid line) and HS-Aptamer@GNPs (dot line) dispersing in ultrapure water.

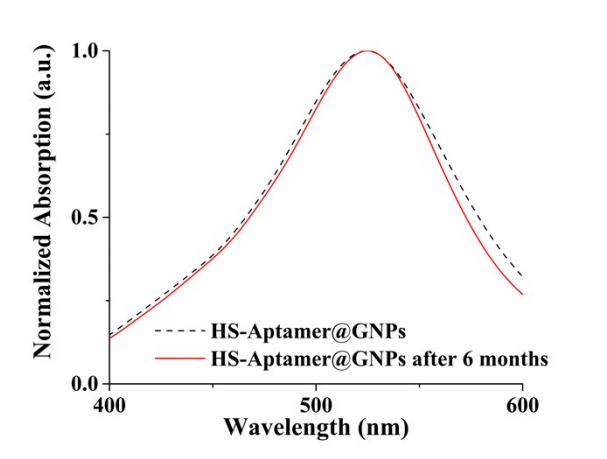

Fig.S3 Normalized absorption spectra of HS-Aptamer@GNPs (black dash line) and HS-Aptamer@GNPs after 6 months (red solid line).

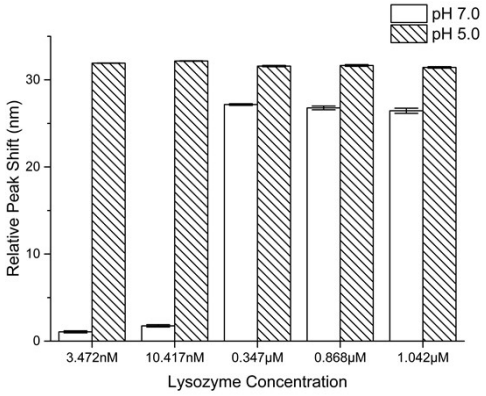

Fig. S4 Spectral respond of 0.125 0 nM HS-Aptamer@GNPs to lysozyme with different concentration in 0.01 M phosphate buffer with 0.05 M NaCl, and with pH 5.0 and 7.0 respectively.

Table. S1 The calibration curve and LOD for detecting lysozyme

HS-Aptamer@GNPs Concentration (nM)	Critical Point at Concentration of Lysozyme (nM)			Linear Range (nM)	LOD (nM)
	Before/after Critical Point	Slope	R^2		
0.062 5	0.868			0.174-1.736	0.118
	Before	11.534	0.979		
	After	29.866	0.985		
0.125 0	1.389			0.347-2.431	0.054
	Before	7.757	0.991		
	After	31.850	0.998		
0.250 0	2.431			0.694-4.167	0.055
	Before	4.382	0.990		
	After	23.799	0.998		

LOD was calculated by 3σ/slope, where σ is the standard deviation of the blank with 10 times detection.

Table. S2 Comparison of performance of different lysozyme detecting methods

Methods	Range (nM)	LOD (nM)	Ref.
Colorimetric method (unmodified-aptamer/GNPs)	4.4-200	4.4	[1]
Colorimetric method (unmodified-aptamer/GNPs)	4-60	4.0	[2]
Colorimetric method (GNPs growth)	5-50	0.1	[3]
Fluorescence method (unmodified-aptamer/GNPs)	1-20	0.55	[2]
Fluorescence method (unmodified-aptamer/GNPs/ThNI)	0-50	10	[4]
SPR method (PMAPA nanoparticles film)	1-50	0.66	[5]
Electrochemical method (TCA/GNP/ssDNA network)	0.005-1	0.0001	[6]
Colorimetric method (HS-Aptamer@GNPs)	0.347-2.431	0.054	This work

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