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Electronic Supplementary Information (ESI) available:

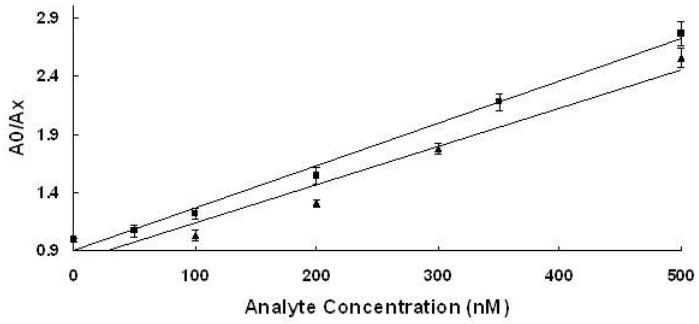

Fig S1. Plot of the values of absorption ratio of the ssDNA/AgNPs solutions as a fuction of the concentration of cysteine (square dots) or glutathione (triangle dots).

As shown in Fig S1, cysteine and glutathione can be detected with a detection limit of 50 nM and 100 nM, respectively. In addition, when the concentration of glutathione is beyond 1 μM, A_{393} value is significantly increased (data not shown), which indicates high concentration glutathione can stabilize AgNPs. The phenomena could be explained that glutathione is one of short peptide composed of three amino acids and can be used to stabilize AgNPs at high concentration.[1] So glutathione can be only detected at low concentration using this method.

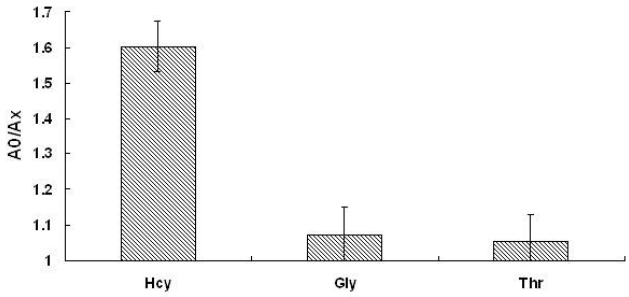

Fig S2. The absorption ratio (A_0/A_x) in the presence of 500 nM homocysteine, glycine, threonine in 0.1% bovine serum with addition 100 mM $NaNO_3$.

In order to test the selectivity of the method for simulated samples, we detected 500 nM homocysteine, glycine and threonine in 0.1% bovine serum. Only homocysteine could exhibit a high absorption ratio. The A_0/A_x value of homocysteine in 0.1% bovine serum is significantly lower than that in the ultrapure water. Maybe it is because proteins in bovine serum can bind to the surface of AgNPs to protect AgNPs from salt-induced aggregation. The mechanism is similar to the interaction between AuNPs and protein. Through optimizing ssDNA concentration and salt concentration, we can improve the assay sensitivity in real sample.

1. R. C. Doty, T. R. Tshikhudo, M. Brust and D. G. Fernig, *Chem. Mater.*, 2005, **17**, 4630-4635.