

# **Colorimetric and ultra-sensitive fluorescence resonance energy transfer determination of H<sub>2</sub>O<sub>2</sub> and glucose by multi-functional Au nanoclusters**

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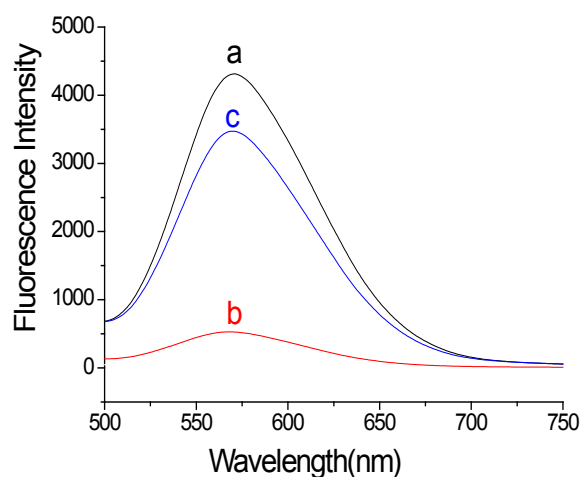
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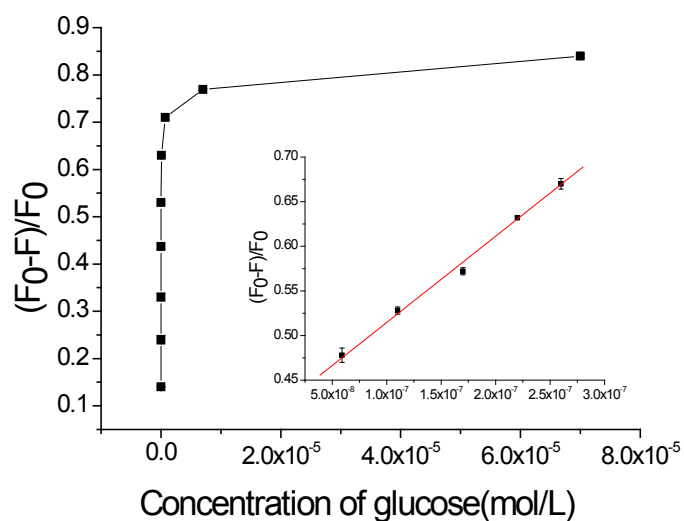
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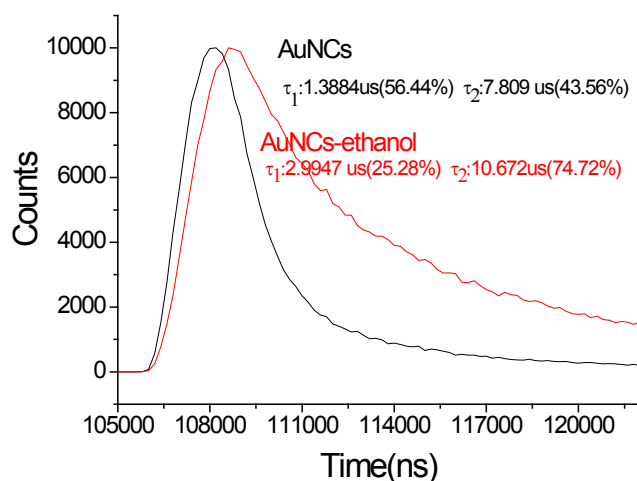
**Fig. S1** Photograph showing the color change before (right) and after (left) addition of a mixture of human serum and glucose oxidase to the AuNCs and TMB under visible light.



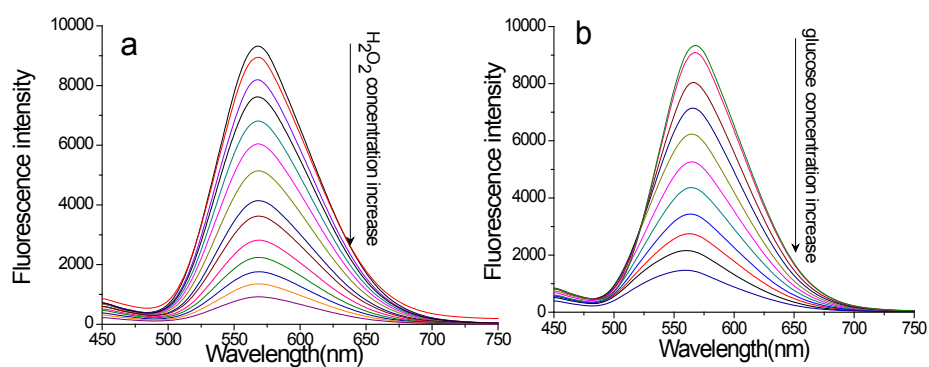
**Fig. S2** Effects of different components on the fluorescence intensity: *a* represents the mixture of AuNCs and TMB and *b* shows the drastic decrease in the fluorescence occurs after addition of  $\text{H}_2\text{O}_2$ . The fluorescence intensity is gradually enhanced as shown by *c* with ascorbic acid reacting with ox-TMB forming TMB.



**Fig. S3** Solution-dependent fluorescence intensity of the AuNCs due to  $\text{H}_2\text{O}_2$  in the presence of TMB, where  $F_0$  and  $F$  are the fluorescence intensity of the AuNCs at 580 nm in the absence and presence of  $\text{H}_2\text{O}_2$ , respectively, and the inset figure showing a good linear relationship in the concentration range between  $6 \times 10^{-10}$  and  $2 \times 10^{-9}$  M with the regress coefficient  $R = 0.9959$ .



**Fig. S4** Fluorescence lifetime decay of AuNCs and AuNCs-ethanol excited by 450 nm light and emission at 570 nm.



**Fig. S5** Concentration dependence of the fluorescence emission from AuNCs with *a* representing  $H_2O_2$  and *b* glucose.