Electronic Supplementary Information (ESI)

for

H_2O_2-mediated fluorescence quenching of double-stranded DNA templated copper nanoparticles for label-free and sensitive detection of glucose

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Exploration of fluorescence quenching mechanism

According to the results discussed above, H_2O_2 could strongly quench the fluorescence intensity of ds-DNA templated Cu NPs. The probable quenching mechanism might be attributed to oxidation of ds-DNA templated Cu NPs by H_2O_2. According to the previous report,[S1] the reactions might proceed as follows:

$$Cu^0 + 2H_2O_2 \rightarrow Cu^+ + O_2^{\bullet-} + 2H_2O \quad (1)$$

$$Cu^0 + H_2O_2 \rightarrow Cu^+ + \bullet OH + OH^- \quad (2)$$

$$Cu^+ + H_2O_2 \rightarrow Cu^{2+} + \bullet OH + OH^- \quad (3)$$

$$\bullet OH + H_2O_2 \rightarrow O_2^{\bullet-} + H_2O + H^+ \quad (4)$$

Some reactive intermediates such as hydroxyl radical (●OH) or superoxide anion radical ($O_2^{\bullet-}$) were generated in the reaction between H_2O_2 and Cu NPs. In addition, hydroxyl radical and superoxide anion radical were strong oxidizing species. Thus, these reactions could lead to an effective fluorescence quenching of Cu NPs.

References

S1 Y. Ling, N. Zhang, F. Qu, T. Wen, Z. F. Gao, N. B. Li and H. Q. Luo, *Spectrochim. Acta A Mol. Biomol. Spectrosc.*, 2014, **118**, 315-320.

Table S1 Determination results of glucose in spiked human serum samples (n = 3).

Spiked (mM)	Found (mM)	RSD (%)	Recovery (%)
0	5.34	3.5	_
2	7.38	2.9	100.5
5	10.05	3.2	97.2
10	15.87	2.6	103.5