# A nano-biosensing platform based on CuS-BSA for label-free fluorescent detection of *Escherichia coli*

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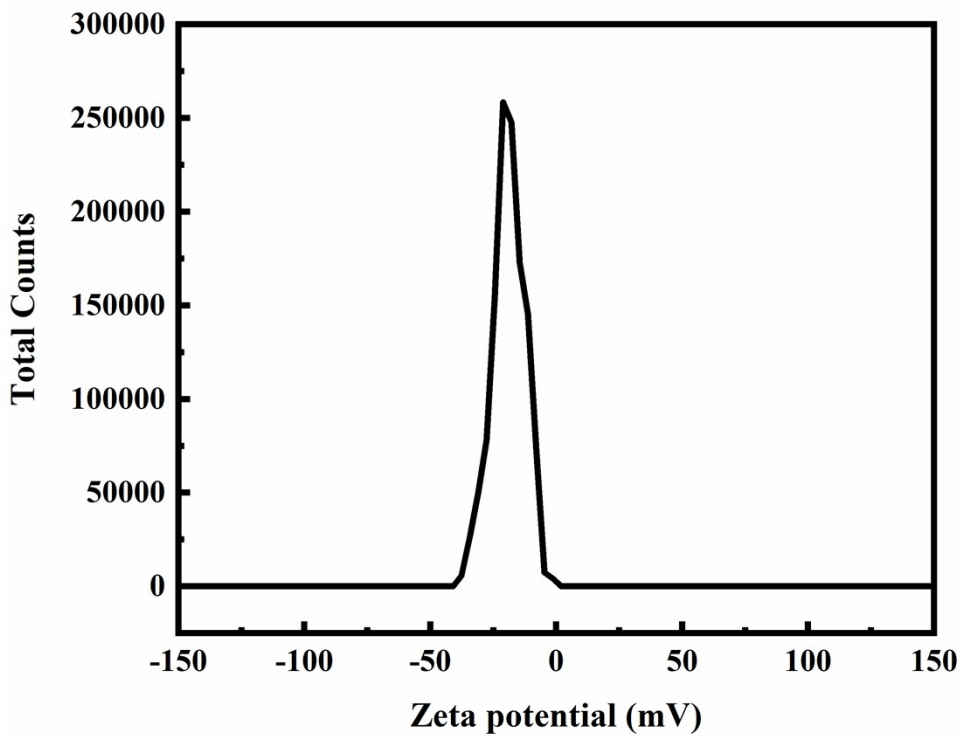


**Fig. S1** Zeta potential curve of CuS-BSA nanoparticles in aqueous medium.

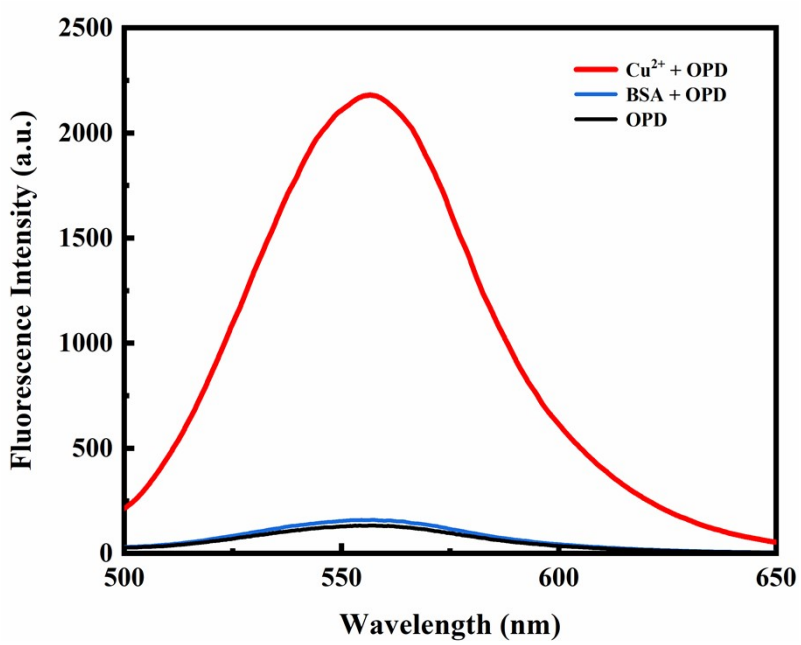


**Fig. S2** Fluorescence emission spectrum of $Cu^{2+}$+ OPD (red line), BSA + OPD (blue line) and OPD (black line).

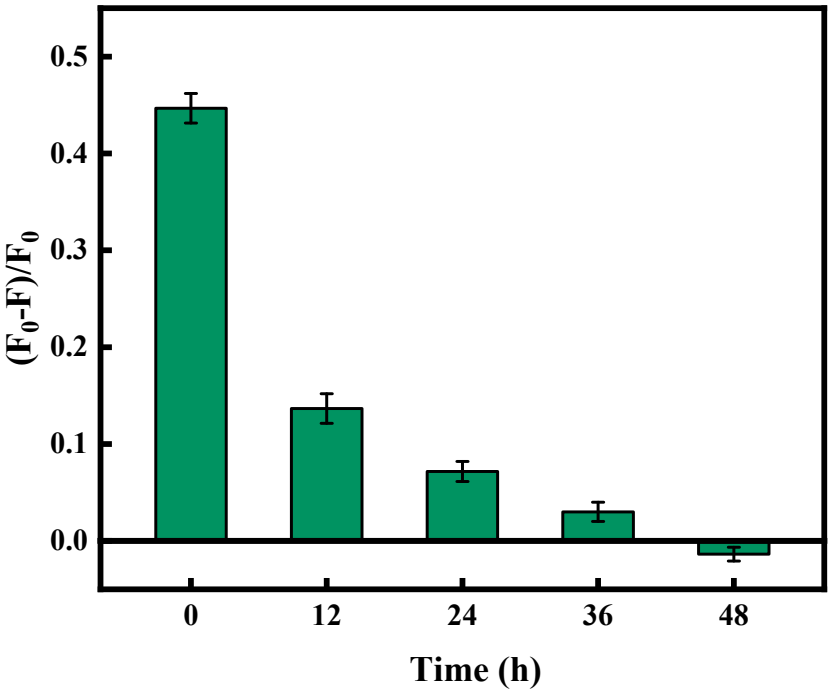


**Fig.S3** Fluorescence signal-to-noise ratio of *E. coli* dead cells on the detection system with respect to time.

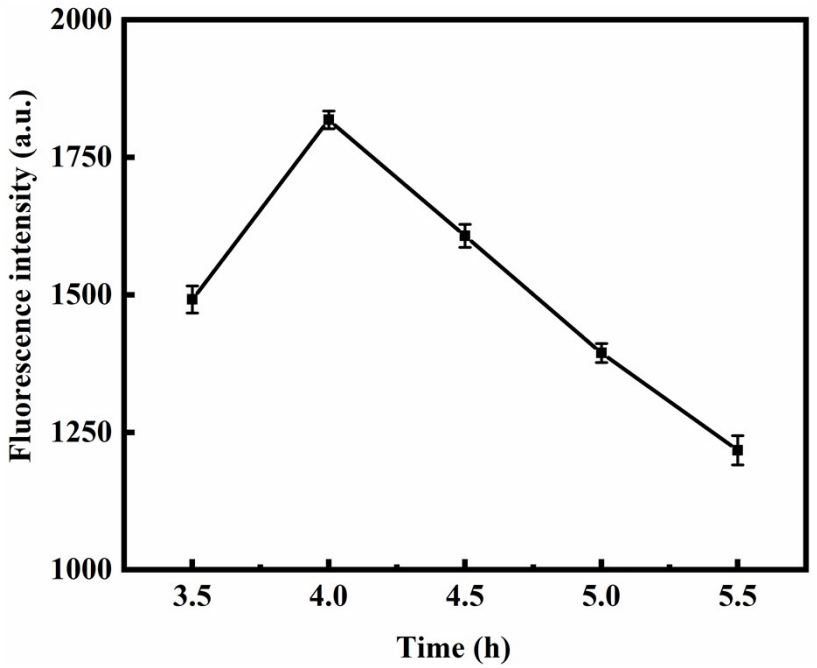


**Fig. S4** Effect of the synthesis time of CuS-BSA on its catalyzed OPD system.

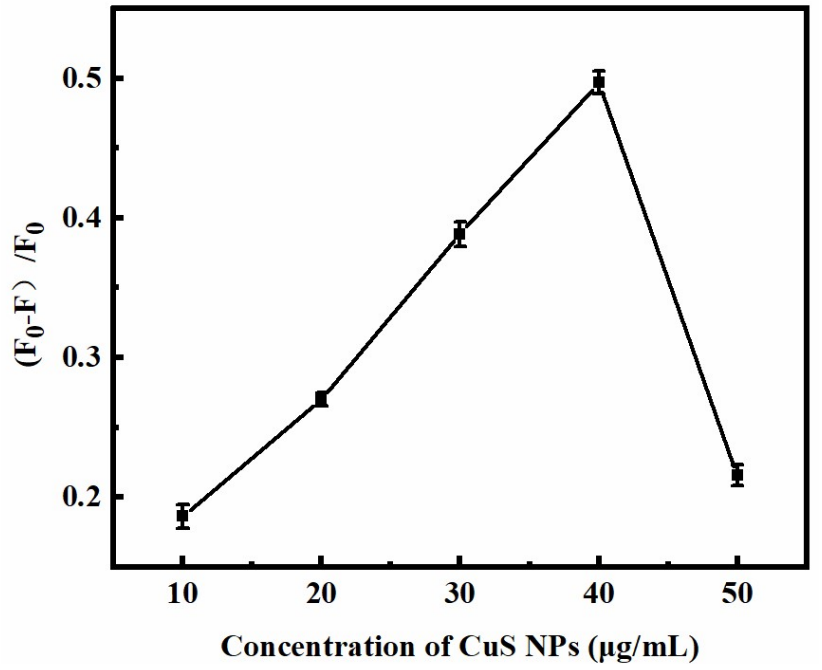


**Fig. S5** The influence of CuS-BSA concentration on the fluorescence signal-to-noise ratio of the detection system.

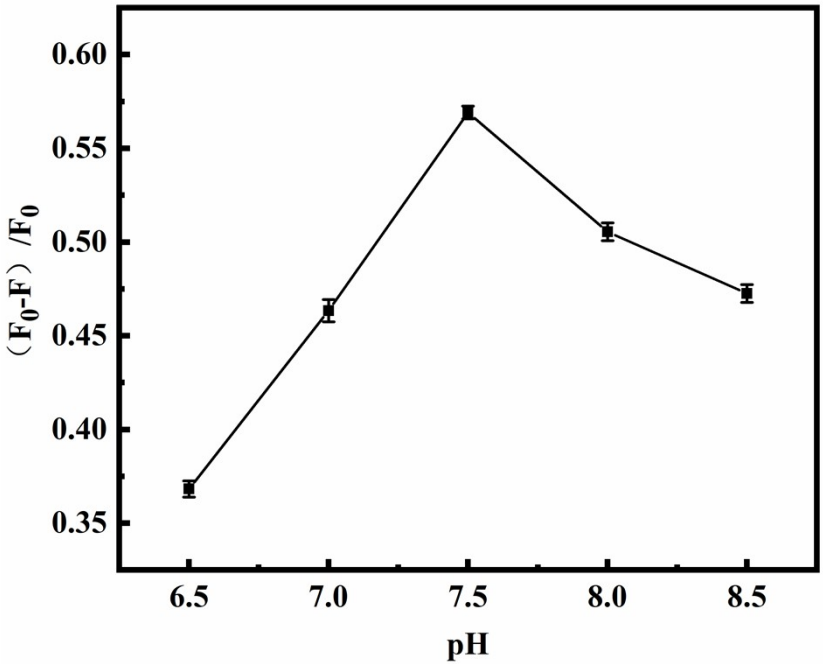


**Fig. S6** The influence of different pH on the fluorescence signal-to-noise ratio of the detection system.

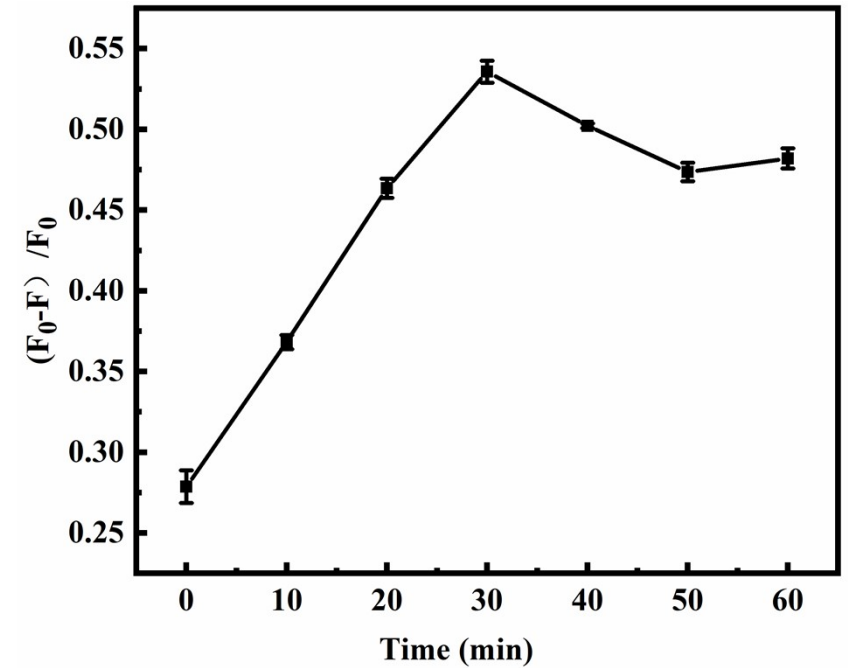


**Fig. S7** The effect of mixing incubation time of CuS-BSA with *E. coli* on the fluorescence signal-to-noise ratio of the detection system.

**Table S1 Comparison of the developed biosensing system with other reported methods for the determination of *E. coli*.**

| Detection method | Linear Range (CFU/mL) | LOD (CFU/mL) | Reference |
|---|---|---|---|
| Immunochromatographic assay | $10^2 - 2 \times 10^8$ | $10^3$ | 1 |
| Colorimetric assay | $5.0\times10^2 - 5.0 \times 10^3$ | 116 | 2 |
| Electrochemical assay | $20 - 2 \times 10^6$ | 20 | 3 |
| Fluorescence method | $1 \times 10^2 - 1 \times 10^8$ | 60 | 4 |
| Fluorescence method | $3.3 \times 10^3 - 10^6$ | $9.2 \times 10^2$ | 5 |
| Fluorescence method | $1.12 \times 10^3$–$1.12 \times 10^7$ | 58 | 6 |
| Fluorescence method | $10^2 - 10^5$ | $10^2$ | 7 |
| Fluorescence method | $12 - 1.2 \times 10^7$ | 9 | This work |

## References


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