

## Supporting information

### A sensitive SERS-based assay technique for accurate detection of foodborne pathogens without interference

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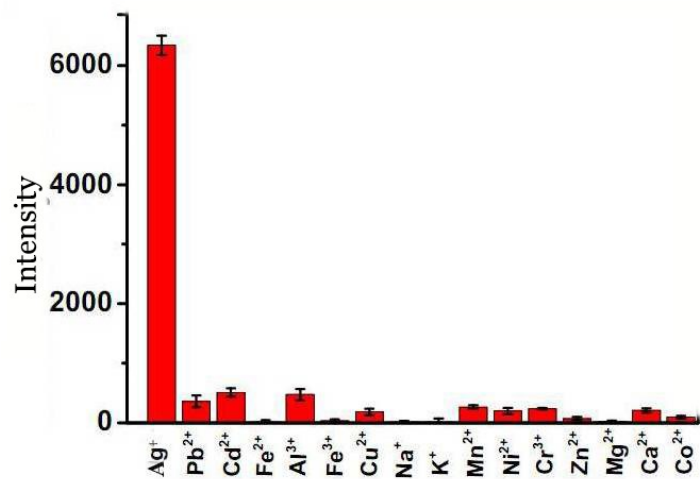
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#### List of contents

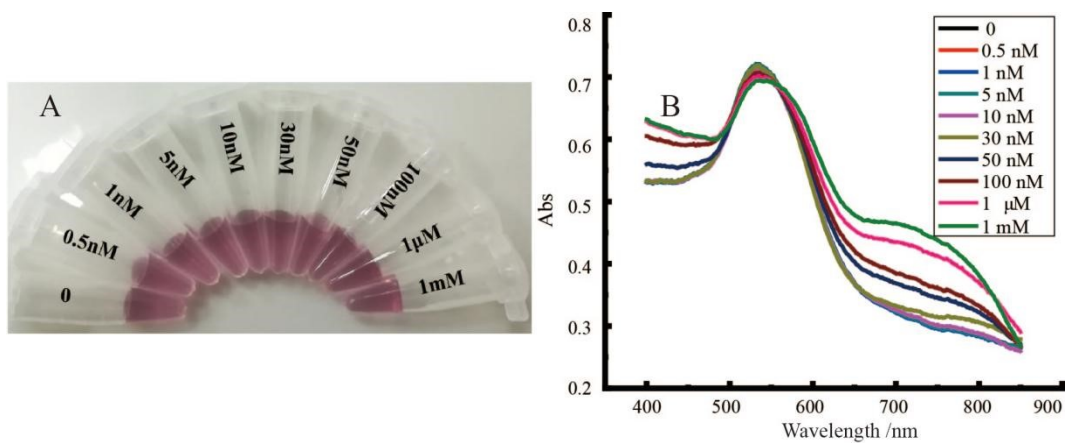
1. **Fig. S1.** Figure of color change before and after in suit reduction of  $\text{Ag}^+$  onto the surface of *E.coli*.
2. **Fig. S2.** The speciality of the functional Au NPs to  $\text{Ag}^+$ .
3. **Fig. S3.** (A) Figure of color change of the functional Au NPs with different concentration of  $\text{Ag}^+$ , (B) UV-*vis* spectroscopy of the functional Au NPs with different concentration of  $\text{Ag}^+$ .
4. **Fig. S4.** SERS spectroscopy of the detection system with three different concentration of *E.coli* (50, 100, 500 cfu/mL).
5. **Fig. S5.** (A) Effect of the amount of MBN, (B) effect of the concentration of the buffer solution, (C) effect of the pH of the buffer solution, (D) effect of the reaction time.
6. **Tab. S1.** Comparison of linear range and LOD with the other existing SERS based methods
7. **Fig. S6** Stability Of functional Au NPs over a period of six months.



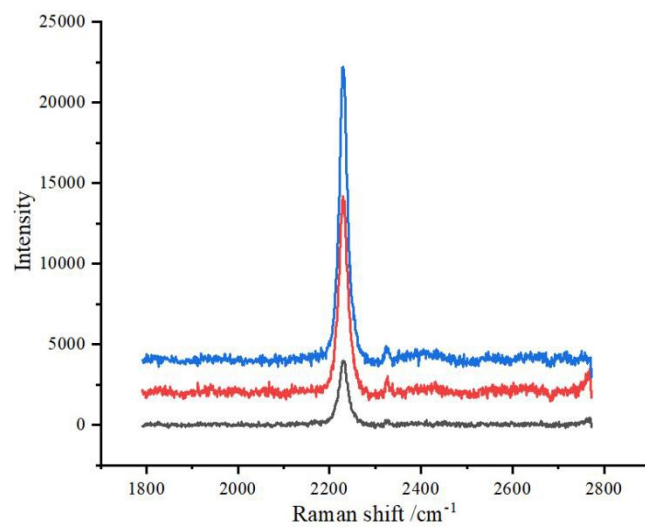
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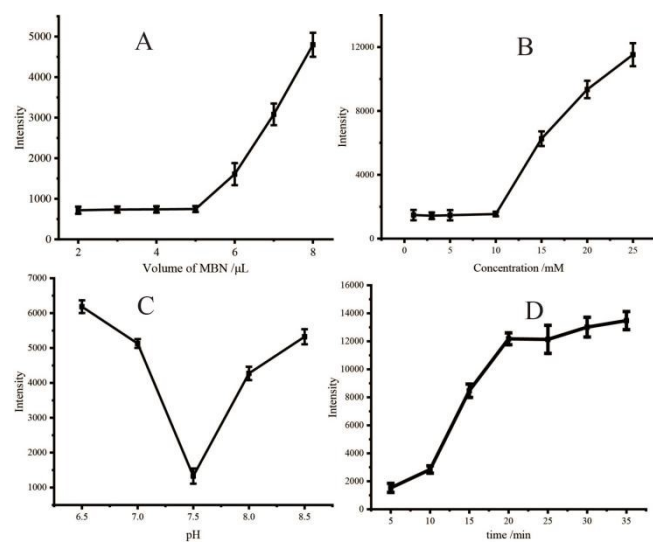
**Fig. S2.** The specificity of the functional Au NPs to Ag<sup>+</sup>.



**Fig. S3.** (A) Figure of color change of the functional Au NPs with different concentration of  $\text{Ag}^+$ , (B) UV-*vis* spectroscopy of the functional Au NPs with different concentration of  $\text{Ag}^+$ .



**Fig. S4.** SERS spectroscopy of the detection system with three different concentration of *E.coli* (50, 100, 500 cfu/mL).

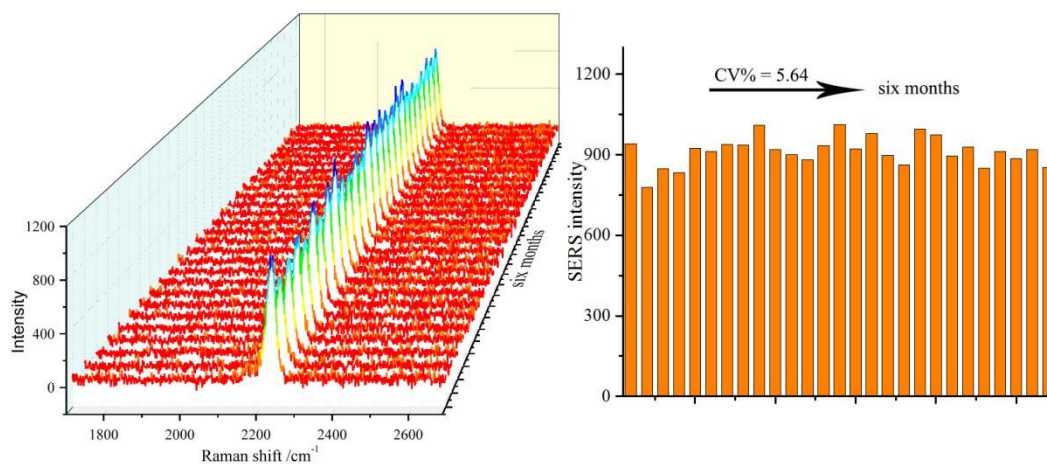


**Fig. S5.** (A) Effect of the amount of MBN, (B) effect of the concentration of the buffer solution, (C) effect of the pH of the buffer solution, (D) effect of the reaction time.

**Table S1.** Comparison of linear range and LOD with the other existing SERS based methods.

Bacteria	Linear range (cfu/mL)	LOD (cfu/mL)	Reference
<i>E.coli</i>	100-700	5	Chen et al., 2024 <sup>[1]</sup>
<i>E.coli</i>	10-10 <sup>4</sup>	10	Zhou et al., 2020 <sup>[2]</sup>
<i>E.coli</i>	20-10 <sup>5</sup>	50	Zhang et al., 2018 <sup>[3]</sup>
<i>E.coli</i>	50-10 <sup>4</sup>	100	Hongdeok et al., 2016 <sup>[4]</sup>
<i>S. typhimuriu</i>	10 <sup>2</sup> -10 <sup>6</sup>	100	Zheng et al., 2021 <sup>[5]</sup>
<i>E.coli</i>	10-5×10 <sup>4</sup>	10	This work

1. Z. Chen, L. Yu, Z. Zhang, L. Su and Y. Xiong, *ACS Food Sci. Technol.*, 2024, **4**, 373.
2. S. Zhou, C. Lu, Y. Li, L. Xue, C. Zhao, G. Tian, Y. Bao, L. Tang, J. Lin and J. Zheng, *ACS Sensors*, 2020, **5**, 588.
3. S. Zheng, J. Xiao, J. Zhang, Q. Sun, D. Liu, Y. Liu and X. Gao, *Biosens Bioelectron.*, 2024, **247**, 115913.
4. C. Y. Zhang, C. W. Wang, R. Xiao, L. Tang, J. Huang, D. Wu, S. W. Liu, Y. Wang, D. Zhang, S. Q. Wang and X. M. Chen, *J. Mater. Chem. B.*, 2018, **6**, 3751.
5. J. Hongdeok, H. E. Young, K. Yongshin, C. Jaebum, J. Jihoon and L. D. Woo, *J. biomed. Lnanotechnol.*, 2016, **12**, 1938.



**Fig. S6.** Stability of functional Au NPs over a period of six months.