

Supporting Information

Highly Sensitive and Reproducible SERS Substrate Based on Ordered Multi-Tipped Au Nanostar Arrays for the Detection of Myocardial Infarction Biomarker Cardiac troponin I

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Limit of detection (LOD) calculation

The LOD values for cTnI were calculated by the International Union of Pure and Applied Chemistry (IUPAC) standard method.¹

$$\text{LOD} = y_{\text{blank}} + 3 \times \text{SD}_{\text{blank}}$$

Where y_{blank} is the average value of the blank signal, the blank sample refers to the sample with the same composition as the test sample but does not contain the test component, and SD_{blank} is the standard deviation of the blank sample signal.

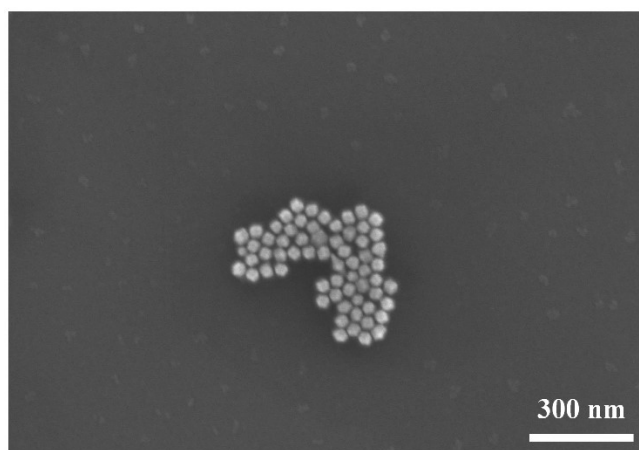


Fig. S1. SEM image of unetched Au nanopolyhedra.

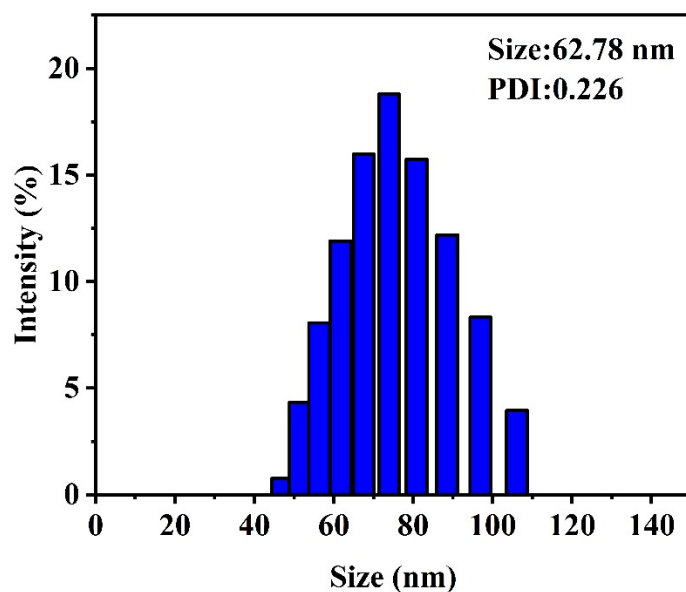


Fig. S2. Size distribution of unetched Au nanopolyhedra.



Fig. S3. Comparison of the color of unetched (left) and etched (right) Au NPs.

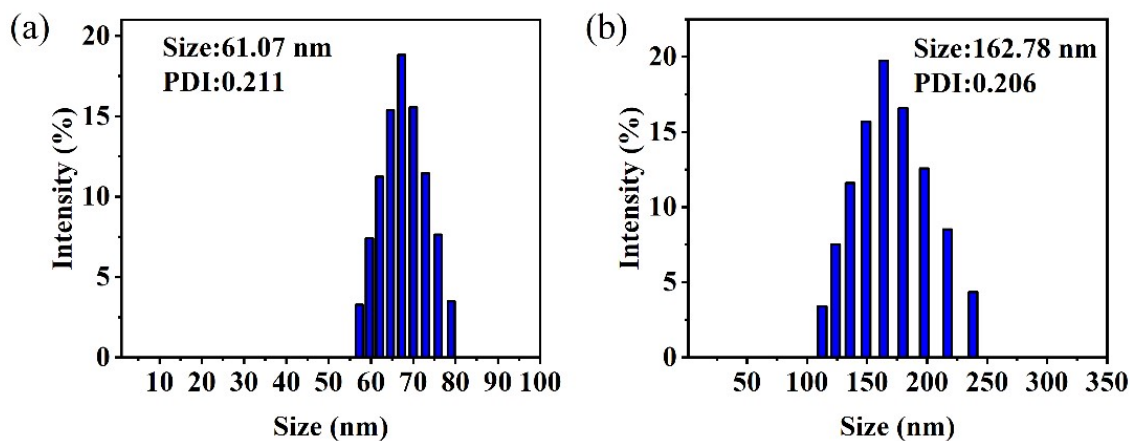


Fig. S4. Particle size distribution of (a) Au@4-MBA and (b) SERS nanotags.

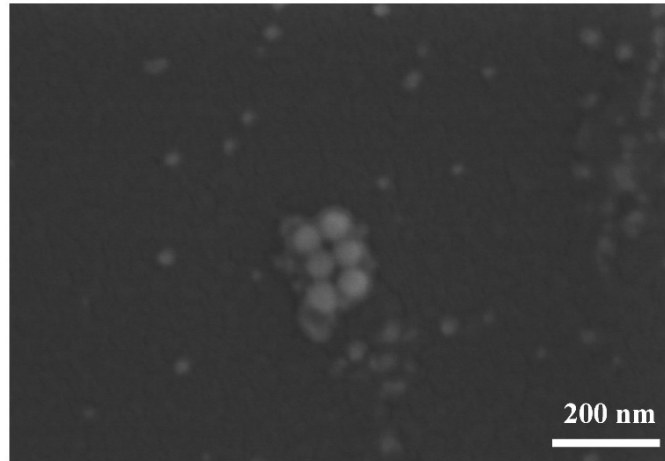


Fig. S5. SEM image of SERS nanotags.

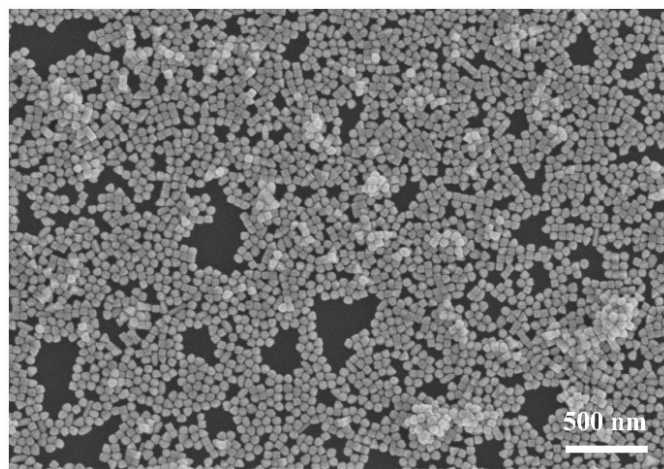


Fig. S6. SEM image of self-assembly of unetched Au nanopolyhedron monolayer.

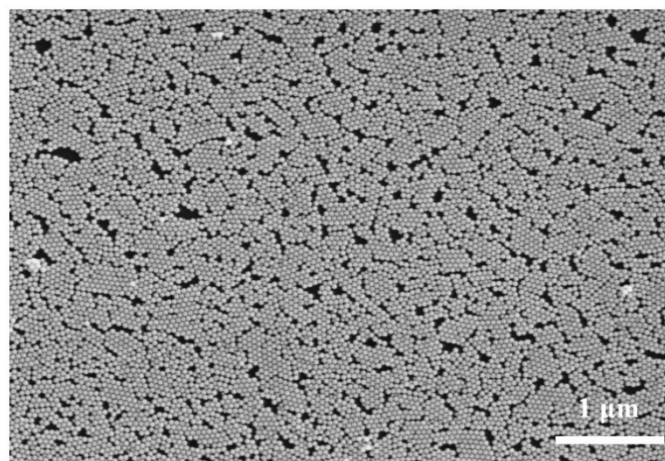


Fig. S7. SEM image of large-area Au nanosphere array.

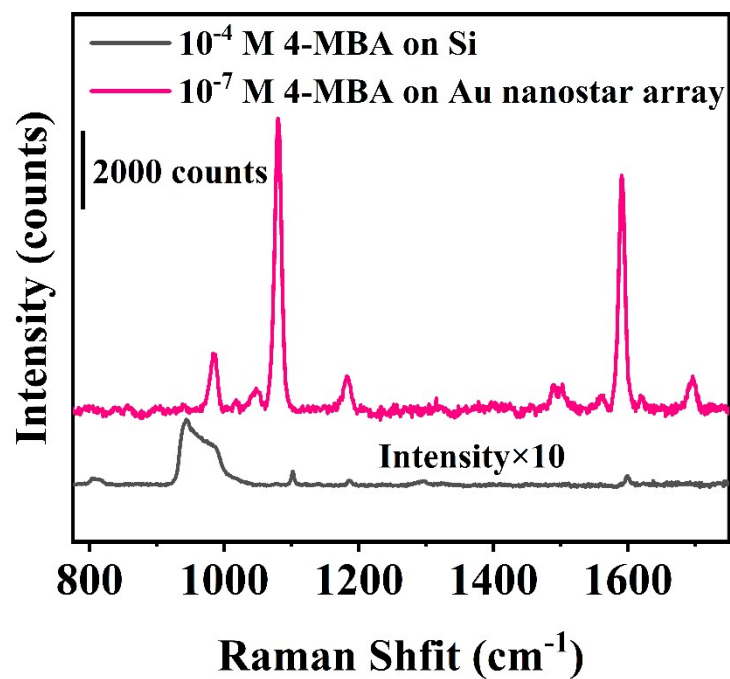


Fig. S8. SERS spectra of 4-MBA on Au nanostar array (red line) and silicon wafer (black line).

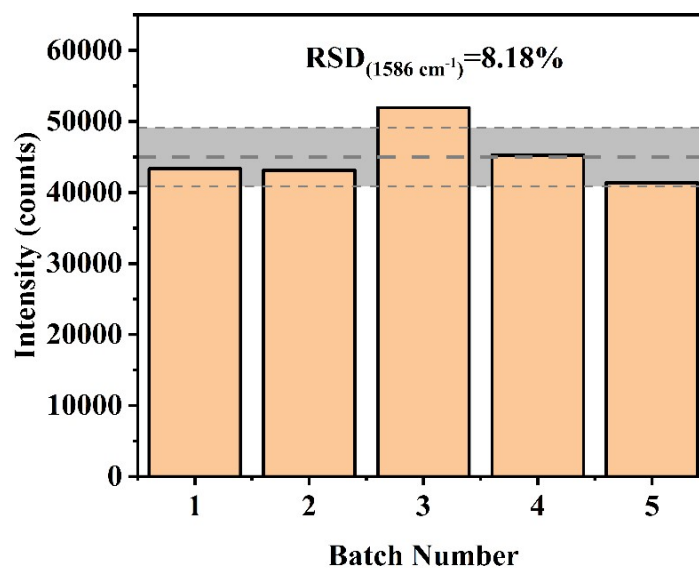


Fig. S9. RSD of Raman intensity at 1586 cm⁻¹ of 4-MBA (10⁻⁴ M) obtained from 5 different Au nanostar arrays.

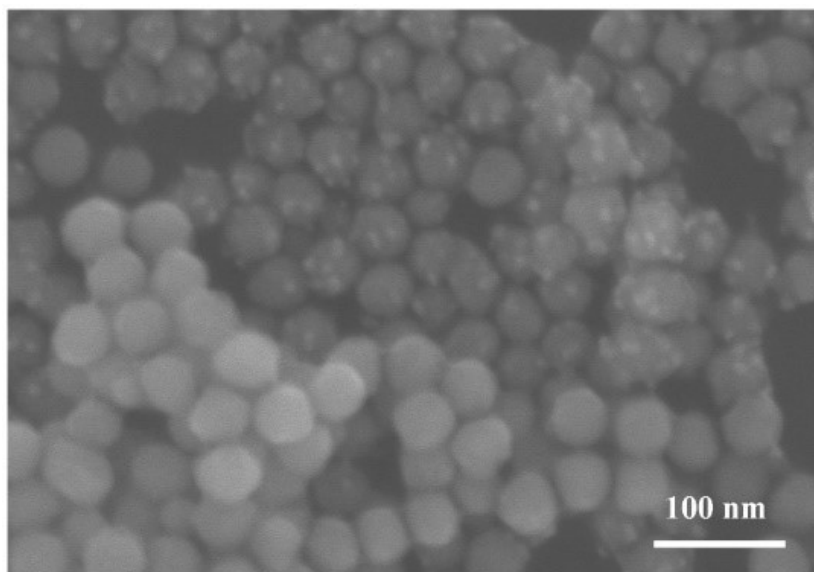


Fig. S10. SEM image of the SERS substrate after immune reaction binding at a cTnI concentration of 100 ng/mL.

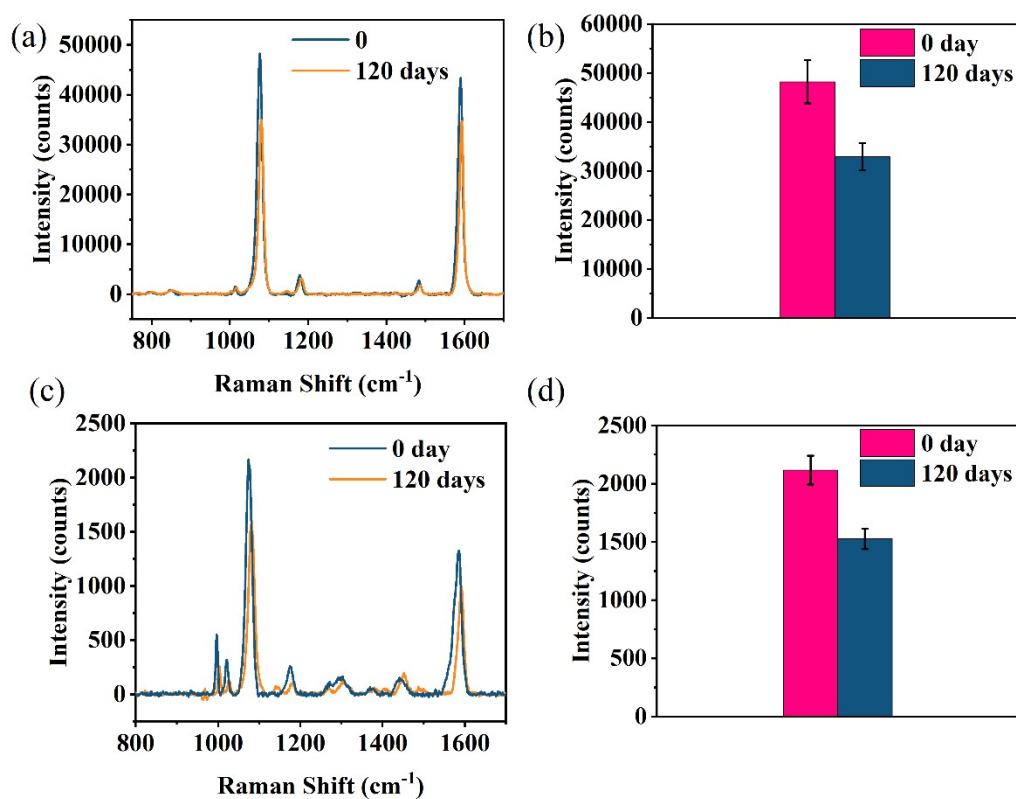


Fig. S11. The Raman intensity of 4-MBA following 120 days of storage of the Raman substrate at room temperature. (a) and (b) 10^{-4} M 4-MBA on Au nanostar array. (c) and (d) SERS sensor immersed with the cTnI concentration of 100 ng/mL.

Table S1 Comparison of our work with some reported immunosensors in the detection of cTnI.

Method	LOD	Refs
ELISA	0.17 ng/mL	2
Chemiluminescence	10 pg/mL	3
Electrochemiluminescence	0.03 ng/mL	4
Fluorescence immunoassay	12 pg/mL	5
SERS	8.9 pg/mL	6
SERS	0.27 pg/mL	7
SERS	9.09 pg/mL	This work

References

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