Supporting Information

Polydopamine Stabilizes Silver Nanoparticles as SERS Substrate for Efficient Detection of Myocardial Infarction

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Synthesis of PS@Ag First, take 0.5 mL of polystyrene solution, centrifuge 2-3 times with 4 mL of ethanol, and disperse in 0.5 mL of H_2O for the last time. Second, it was added to 80 mL of 98% H_2SO_4, and after ultrasonic dispersion, it was magnetically stirred at 100 rpm for 4 h at 40 °C. Then, they were washed with ethanol by centrifugation at 10,000 rpm and dispersed in ethanol. Then, the above solution and 0.1 g of polyvinylpyrrolidone were dissolved in 20 mL of ethanol, and $Ag(NH_3)^{2+}$ solution was added at 450 rpm, and the reaction was stirred at room temperature for 1 h, followed by magnetic stirring in an oil bath at 70 °C for 7 h. Finally, it was washed with ethanol by centrifugation at 10,000 rpm and dispersed in ethanol, and the solution finally turned gray.

Synthesis of Ag@PDA Take 2 mL of the prepared Ag NPs, add it to 40 mL of H_2O, add 3 mL of 1.5 M Tris HCl and 2 mg/mL of 10 mL of DA aqueous solution, and react for 24 h. Centrifuge at 12,000 rpm for 15 min twice, and finally disperse in 10 ml H_2O.

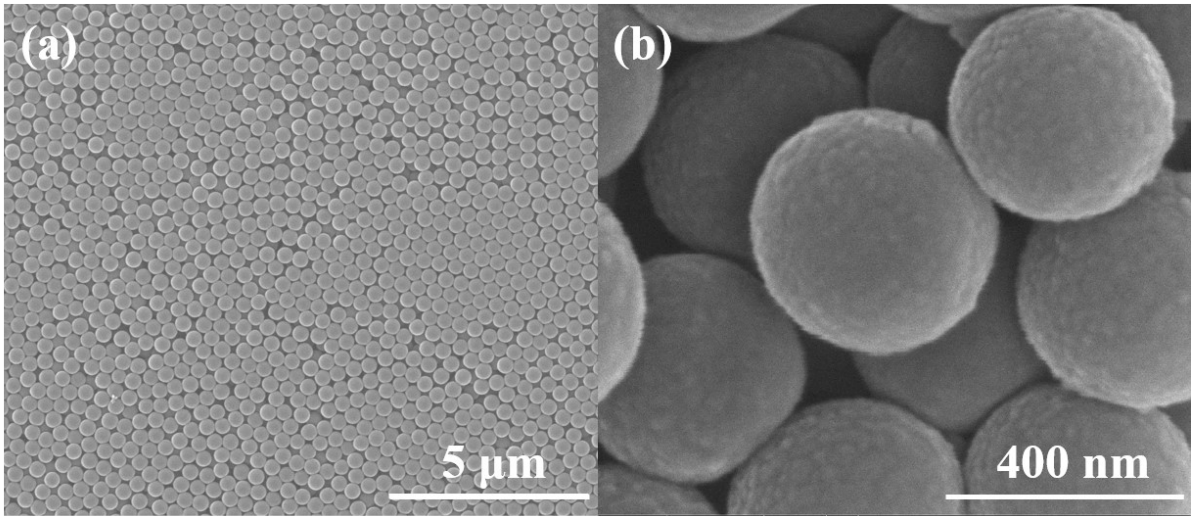

Figure S1 SEM images of PDA at scale of (a) 20 μm and (b) 400 nm.

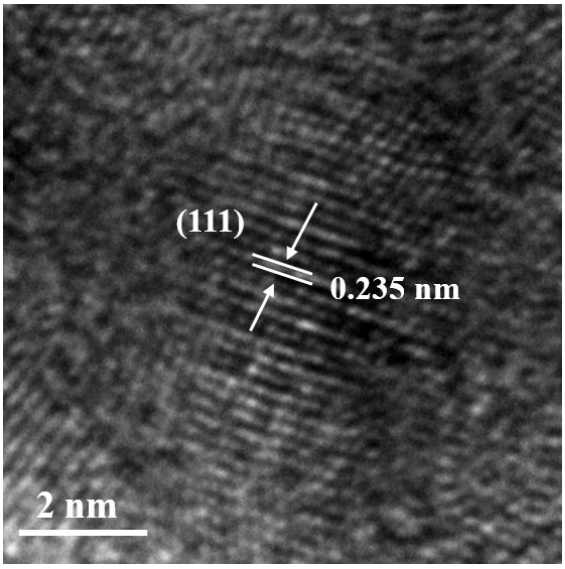

Figure S2 Enlarged image of fringe spacing of an individual Ag nanoparticle in PDA@Ag nanocomposites.

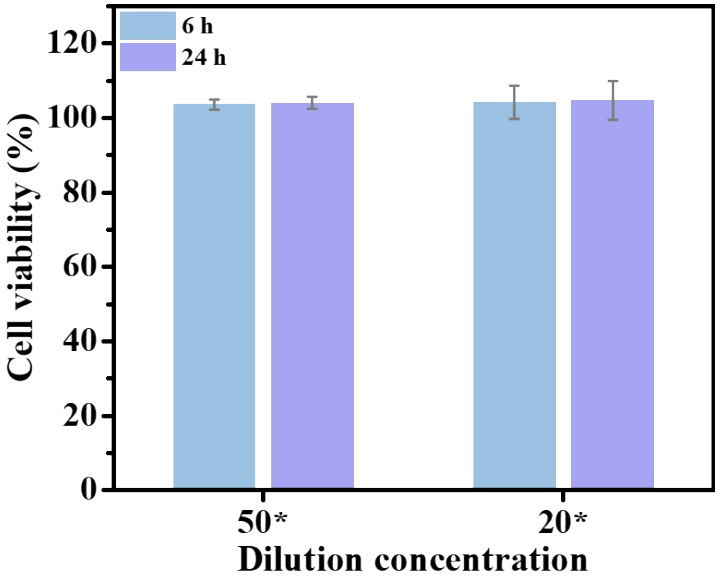

Figure S3 Cell viability of PDA@Ag under different dilution concentration after 6 h and 24 h.

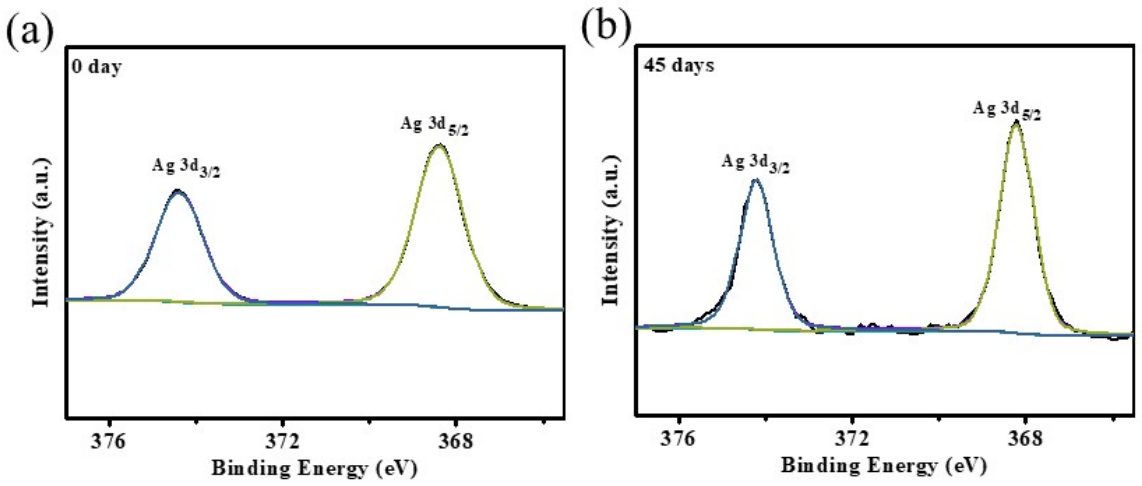

Figure S4 High-resolution XPS spectra of Ag3d in (a) fresh-prepared PDA@Ag and (b) 45 days-stored PDA@Ag.

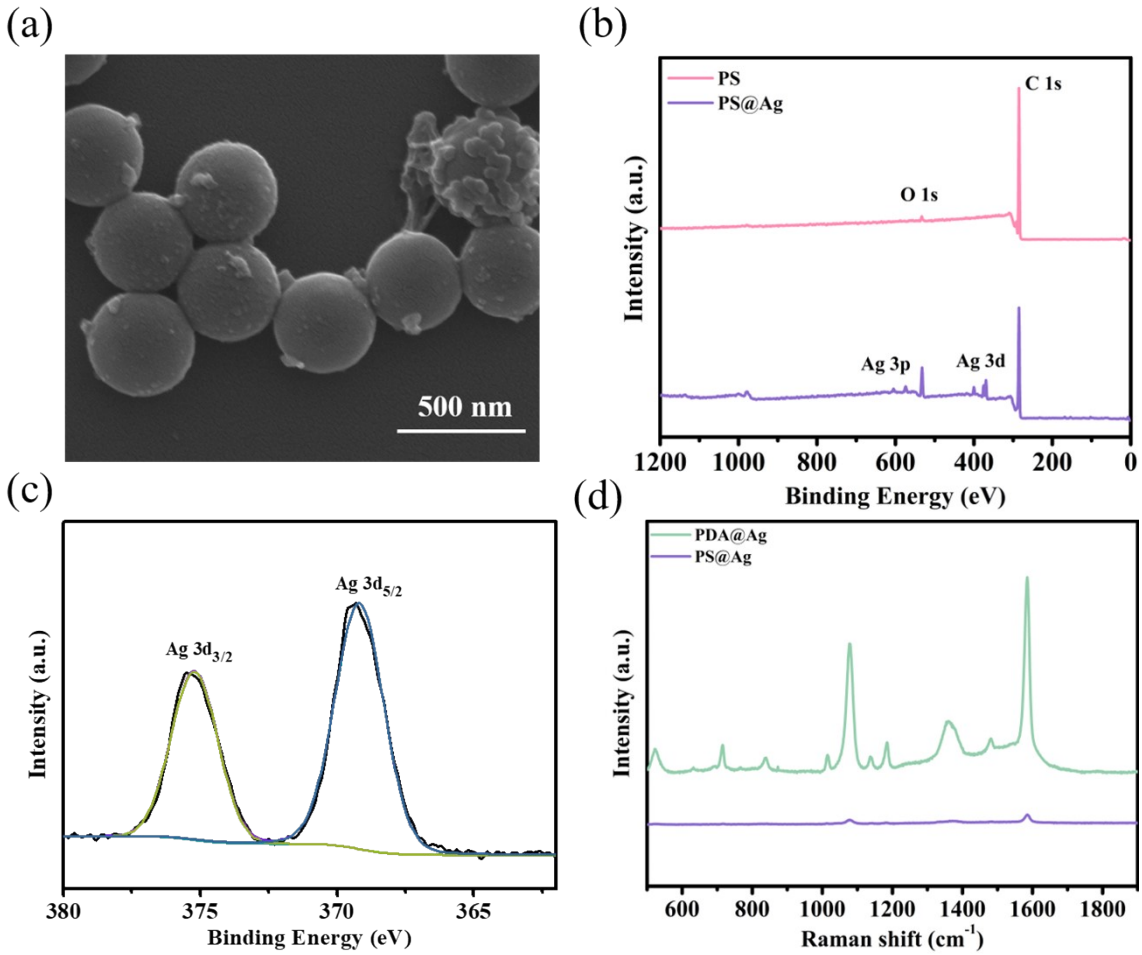

Figure S5 (a) SEM image of PS@Ag; (b) XPS spectrum of PS and PS@Ag; (c) High-resolution XPS spectrum of Ag3d in PS@Ag; (b) Raman spectrum of 60 mM 4-MBA on PS@Ag and PDA@Ag.

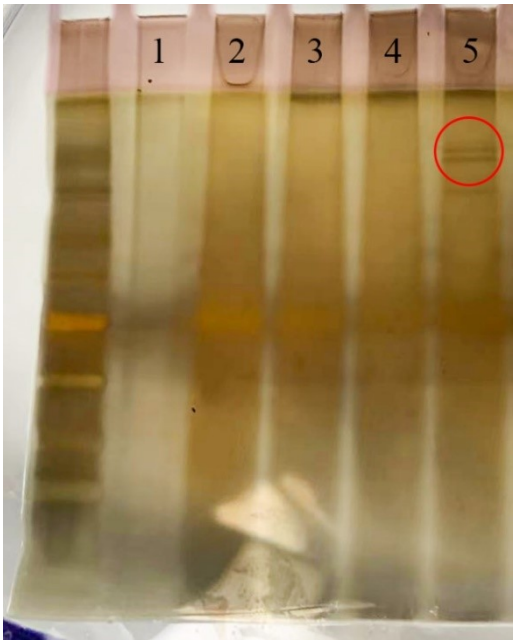

Figure S6 Comparison of electrophoresis results according to the materials in the synthesis. (The materials used in the electrophoresis of bands No. 1-5 are as follows: 1.PDA@Ag; 2.PDA@Ag + 4-MBA; 3.PDA@Ag + 4-MBA + SH-PEG-COOH; 4.PDA@Ag + 4-MBA + SH-PEG-COOH + EDC/NHS; 5.PDA@Ag + 4-MBA + SH-PEG-COOH+ EDC/NHS + Antibody)

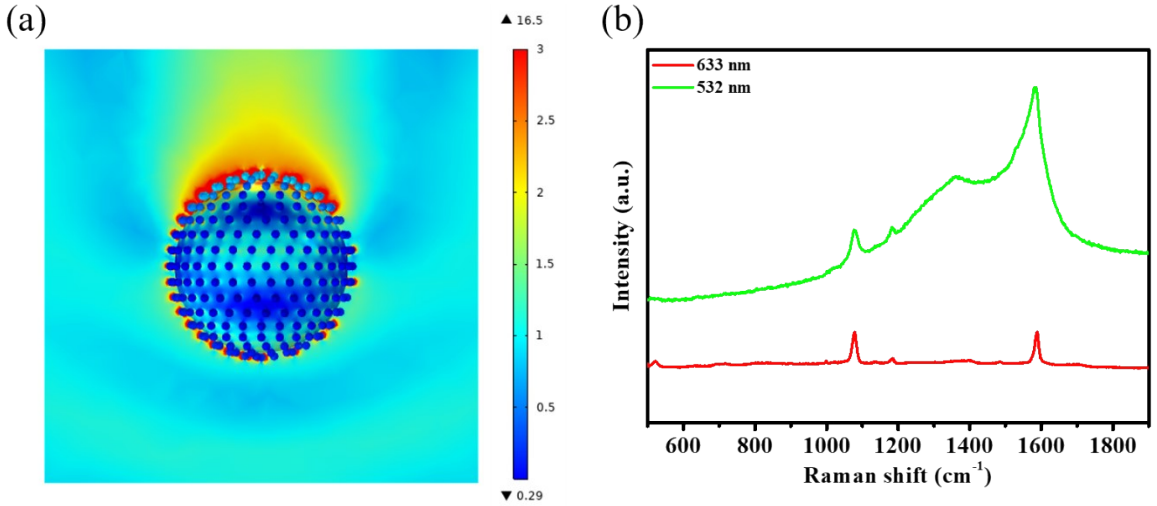

Figure S7 (a) Electrical field distributions of regularly distributed Ag NPs on the PDA. (The light source is 532 nm wavelength) (b) Raman spectrum of standard cTn I samples on PDA@Ag under 532 nm and 633 nm laser.

Table S1 Determination of cTn I in Human Serum Samples with the proposed method.

Sample NO.	Spiked Concentration (ng/mL)	Detection Concentration (ng/mL)	Recovery (%)	CV (%)
1	0.037	0.018	49.89%	10.96%
2	0.045	0.021	46.83%	0.83%
3	0.200	0.090	44.78%	1.97%
4	0.289	0.136	47.04%	4.58%
5	0.717	0.329	45.84%	10.10%
6	0.840	0.536	63.76%	3.53%
7	1.044	1.049	100.48%	4.45%
8	1.619	1.269	78.41%	5.37%
9	2.610	2.141	82.04%	6.51%
10	2.903	2.397	82.57%	9.53%
11	6.253	2.768	44.26%	5.85%
12	8.697	9.466	108.84%	1.76%
13	9.887	13.725	138.82%	4.94%
14	10.731	16.230	151.24%	3.21%