Electronic Supplementary Material (ESI) for RSC Advances.

SERS quantitative analysis of trace HSA with Coomassie brilliant blue G-250 molecular probe in nanogold sol substrate

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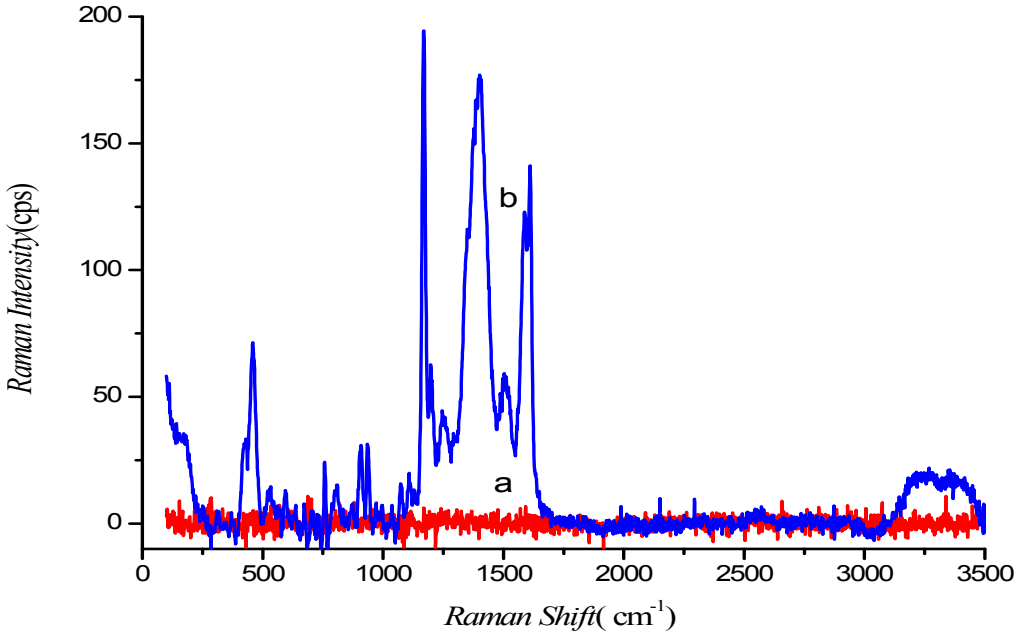

Figure S1 The normal Raman and SERS spectra of CBB.
(a) pH 6.6 PBS-1×10^{-3}mol/L CBB-0.06 mol/L NaCl; (b) 16.74 mg/L Au-pH 6.6 PBS-2.34×10^{-7}mol/L CBBG-0.06 mol/L NaCl

Table S1 Enhanced factor (E_f) for different SERS peak [a]

Raman peak (cm^{-1})	I_{SERS}	K_{SERS} (L/mol)	I_{NRS}	K_{NRS} (L/mol)	E_f
464	64	2.7×10^8	1.4	1423	1.9×10^5
757	24	1.0×10^8	0.4	449	2.3×10^5
907	30	1.3×10^8	0.1	147	8.8×10^5
936	30	1.3×10^8	1.0	1043	1.2×10^5
1171	180	7.7×10^8	2.7	2666	2.9×10^5
1403	173	7.4×10^8	3.1	3129	2.4×10^5
1612	136	5.8×10^8	0.6	608	9.6×10^5

[a] $C_1=2.34\times10^{-7}$ mol/L CBBG and $C_0=1\times10^{-3}$ mol/L CBBG, $K_{SERS}=I_{SERRS}/C_1$, $K_{NRS}=I_{NRS}/C_0$, $E_f=K_{SERS}/K_{NRS}$.

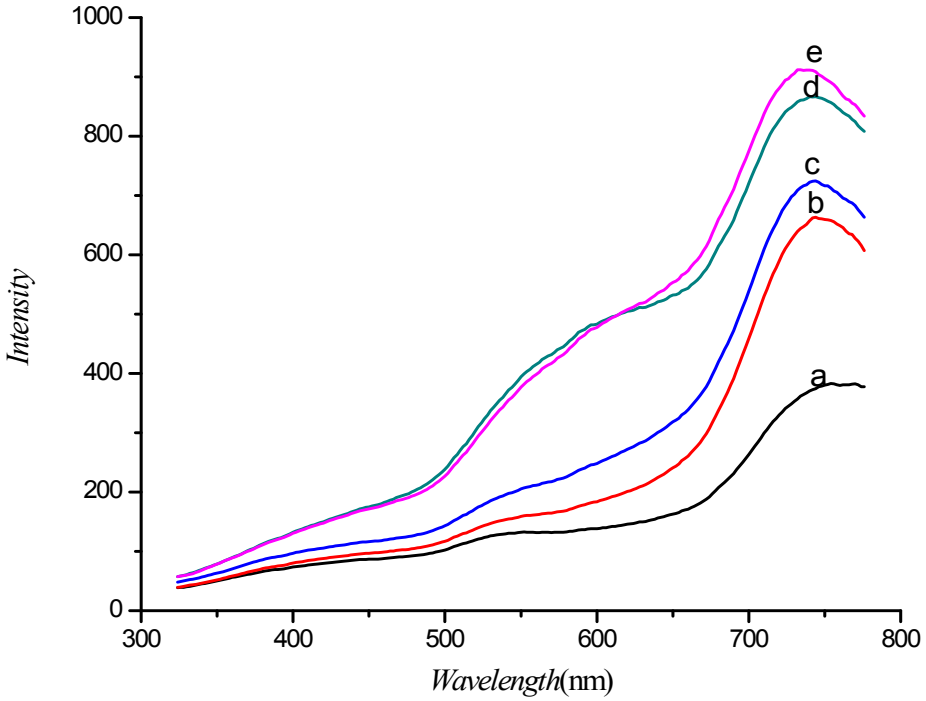

Figure S2 RRS spectra of the PBS-NaCl-NG-CBB system

(a) 16.74 mg/L Au-pH 6.6 PBS-0.06 mol/L NaCl; (b) a-0.29×10^{-7}mol/L CBB; (c) a-1.17×10^{-7}mol/L CBB; (d) a-3.51×10^{-7}mol/L CBB; (e) a-4.68×10^{-7}mol/L CBB.

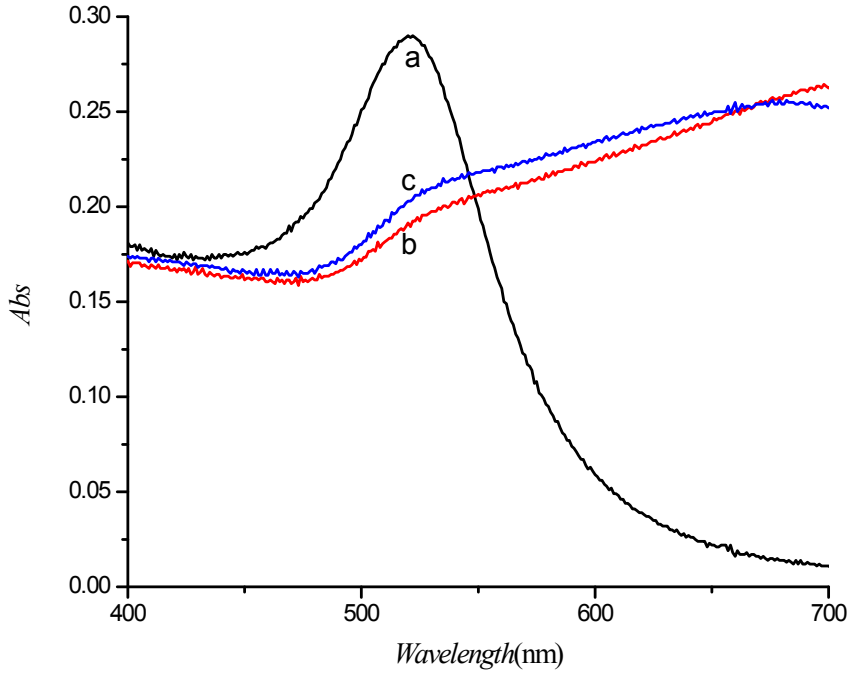

Figure S3 Absorption spectra of the PBS-NaCl- NG-CBB-HSA system

(a) 16.74 mg/L Au-pH 6.6 PBS; (b) a-0.06 mol/L NaCl; (c) b-3.51×10^{-7}mol/L CBB-0.5 mg/L HSA

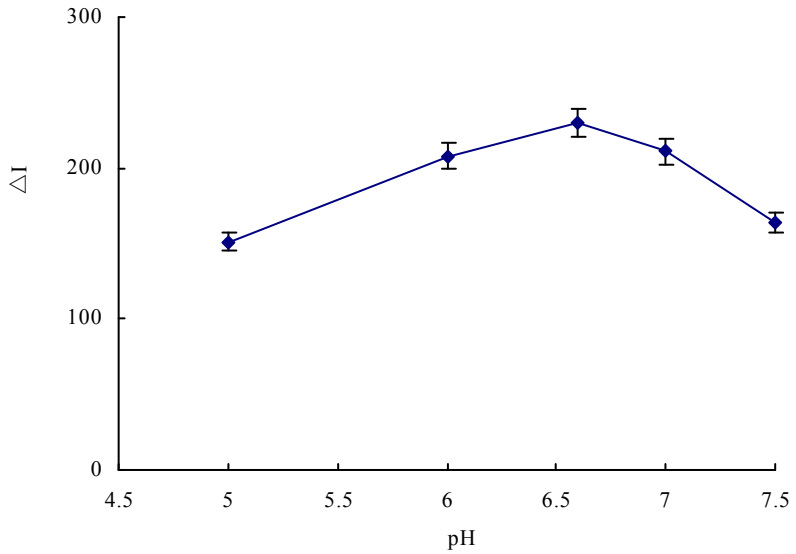

Figure S4 Effect of pH on the Δ*I* value

16.74 mg/L Au-5.86×10^{-7} mol/L CBB-0.06 mol/L NaCl-1.0 mg/L HSA

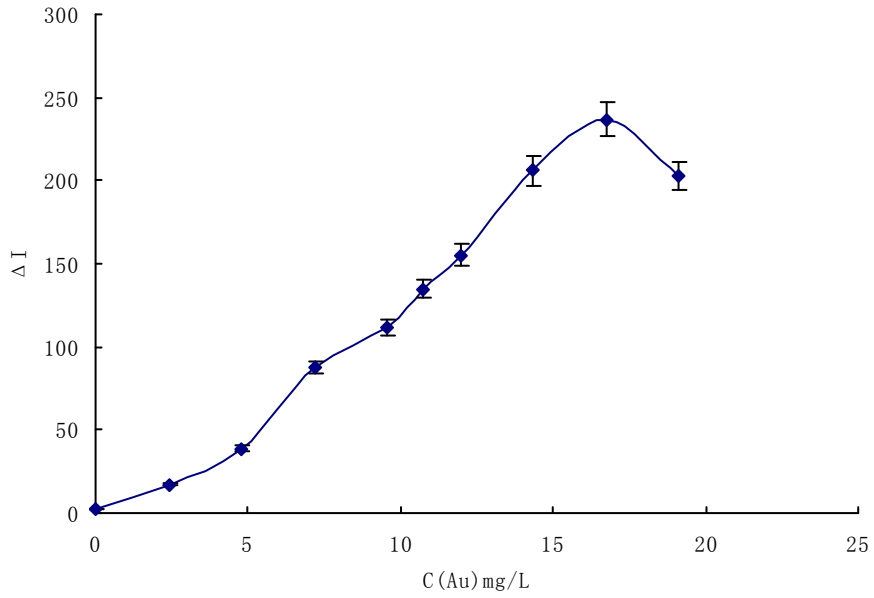

Figure S5 Effect of NG concentration on the Δ*I* value

pH 6.6 PBS -5.86×10^{-7} mol/L CBBG-0.06 mol/L NaCl-1.0 mg/L HSA

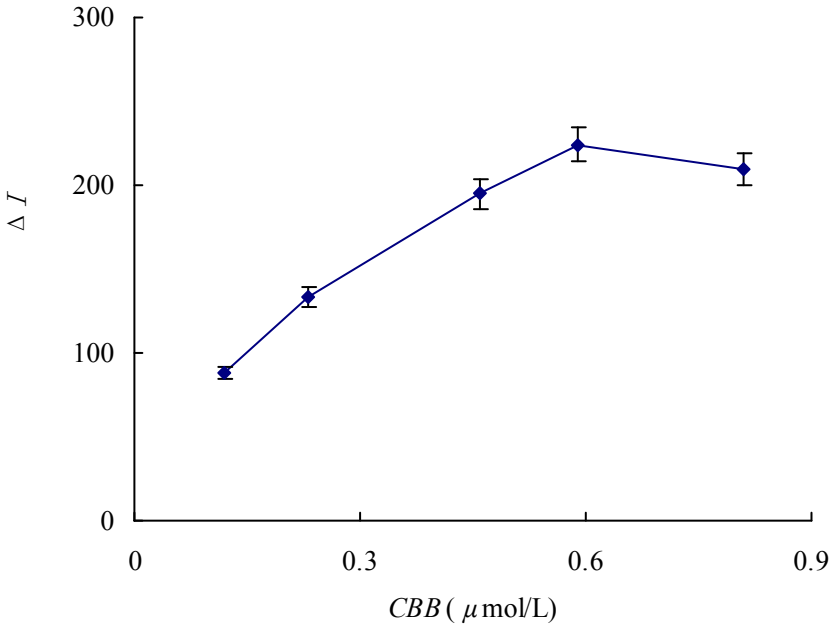

Figure S6 Effect of CBB concentration on Δ*I*

pH6.6 PBS-16.74 mg/L Au-0.06 mol/L NaCl -1.0 μg/mL HSA

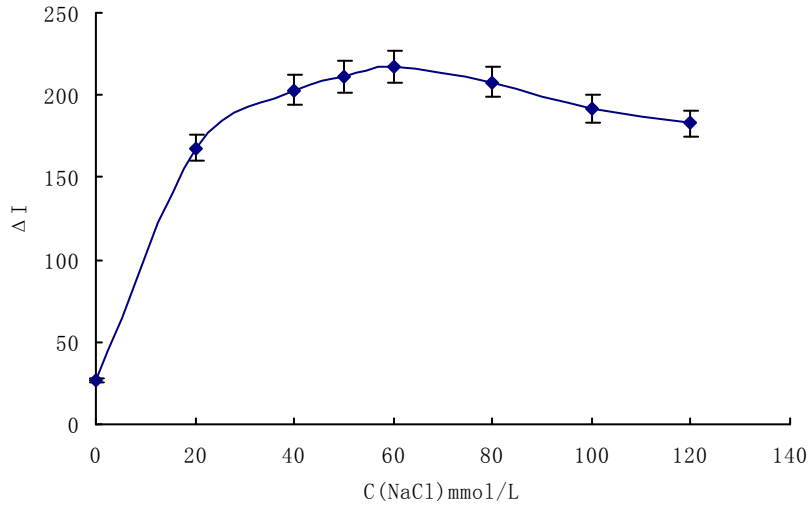

Figure S7 Effect of NaCl concentration on Δ*I*

pH 6.6 PBS -5.86×10^{-7} mol/L CBBG-16.74 mg/L Au -1.0 mg/L HSA

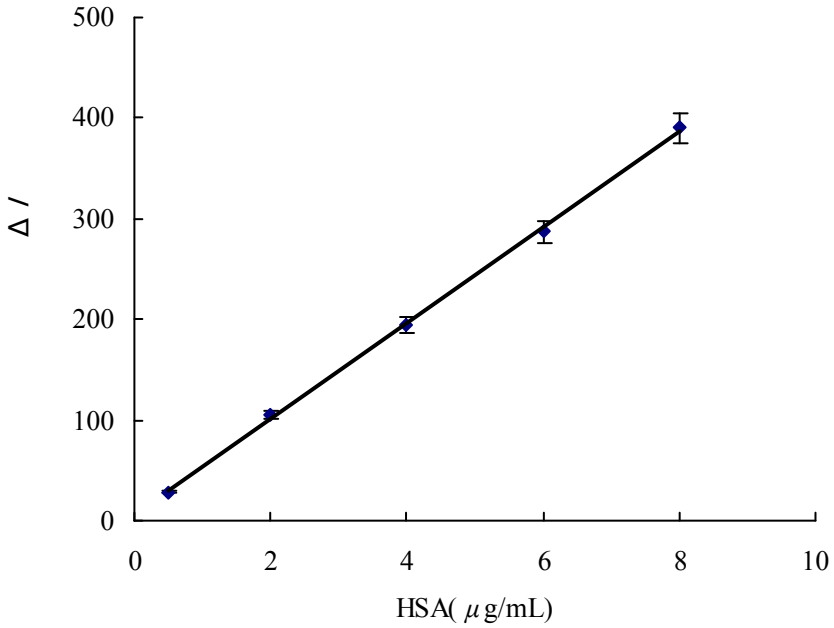

Figure S8 working curve