

Supplementary Information

Bovine serum albumin assisted preparation of ultra-stable gold nanoflowers and their selective Raman response to charged dyes

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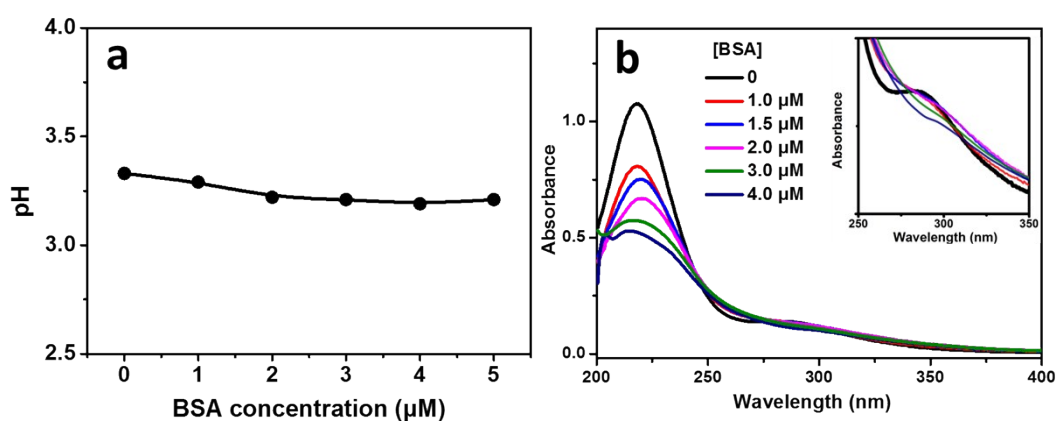


Fig. S1 (a) Variation in pH and (b) UV-visible spectra of the 0.25 mM HAuCl_4 solution with different concentrations of BSA taken after 1 h incubation, using corresponding pure BSA solutions as references. Inset of b: enlargement of the 250-350 nm window. The pH of the solution only changed slightly after the addition of BSA, *i.e.*, decreased from ca. 3.3 to 3.2 after the addition of 5.0 μM BSA. The solution of HAuCl_4 presented two bands at 220 and 291 nm in absence of BSA. After the addition of BSA, intensity of the band at 220 nm decreased gradually, and that of the band at 291 nm disappeared finally, attributed to the gradual replacement of chloride ions by the functional groups (mainly carboxyl groups) of BSA.

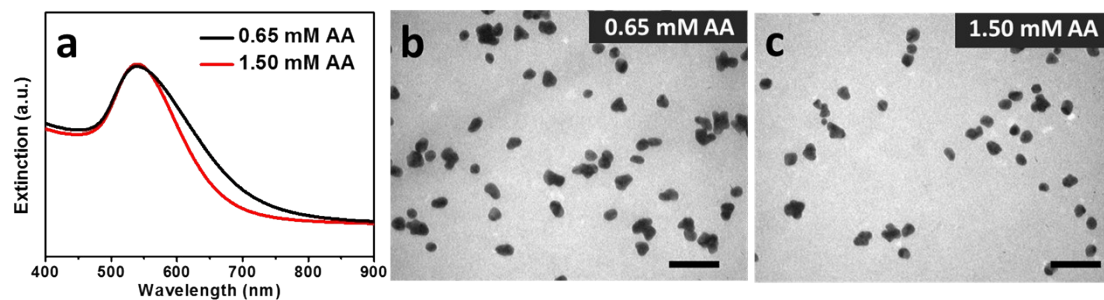


Fig. S2 (a) UV-vis spectra of Au NPs synthesized with 1.0 μM BSA at AA concentrations of 0.65 and 1.50 mM. TEM images of Au NPs obtained at AA concentrations of (b) 0.65 mM and (c) 1.50 mM. The scale bars were 100 nm.

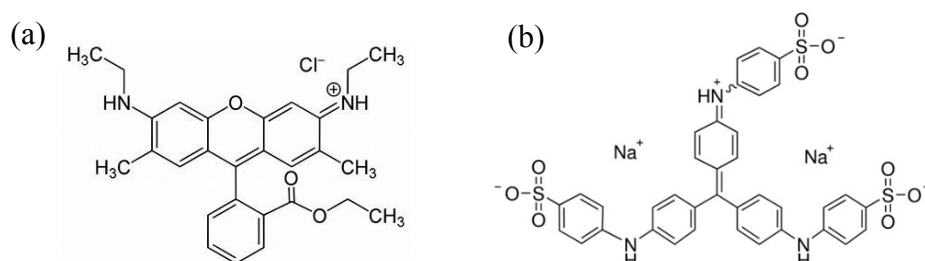


Fig. S3 The structures of (a) Rhodamine 6G and (b) methyl blue.

Table S1 Assignments of Raman bands of Rhodamine 6G in SERS spectra

Bands (cm^{-1})	Assignment
1649	aromatic C-C stretching
1510	aromatic C-C stretching
1363	aromatic C-C stretching
1310	N-H bending
1185	C=C stretching

Table S2 Assignments of Raman bands of methyl blue in SERS spectra

Bands (cm^{-1})	Assignment
1595	C-phenyl in-plane antisymmetric stretching
1361	C-N, Phenyl-C-phenyl antisymmetric stretching
1179	C-phenyl, C-H in-plane antisymmetric stretching
919	Phenyl ring breathing mode

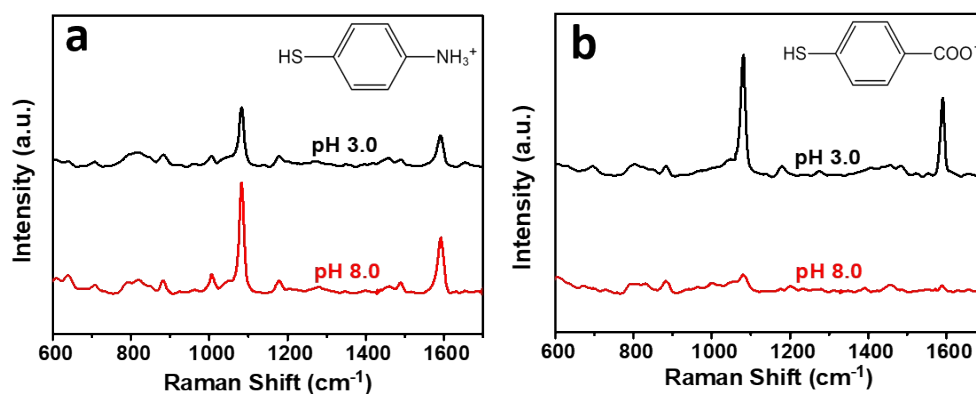


Fig. S4 SERS spectra of (a) 4-aminothiophenol and (b) 4-mercaptobenzoic acid at pH 3.0 and 8.0, recorded after being mixed with the Au nanoflower hydrosols prepared with 3.0 μM BSA for 20 min. It was obvious that the Raman signals of 4-aminothiophenol were detectable even at pH 3.0 and these of 4-mercaptobenzoic acid were observable even at pH 8.0, possibly attributed to the strong affinity of the thiol group to the Au particle surface.