

Supporting Information

Ligand-modulated synthesis of gold nanoclusters for sensitive and selective detection of folic acid

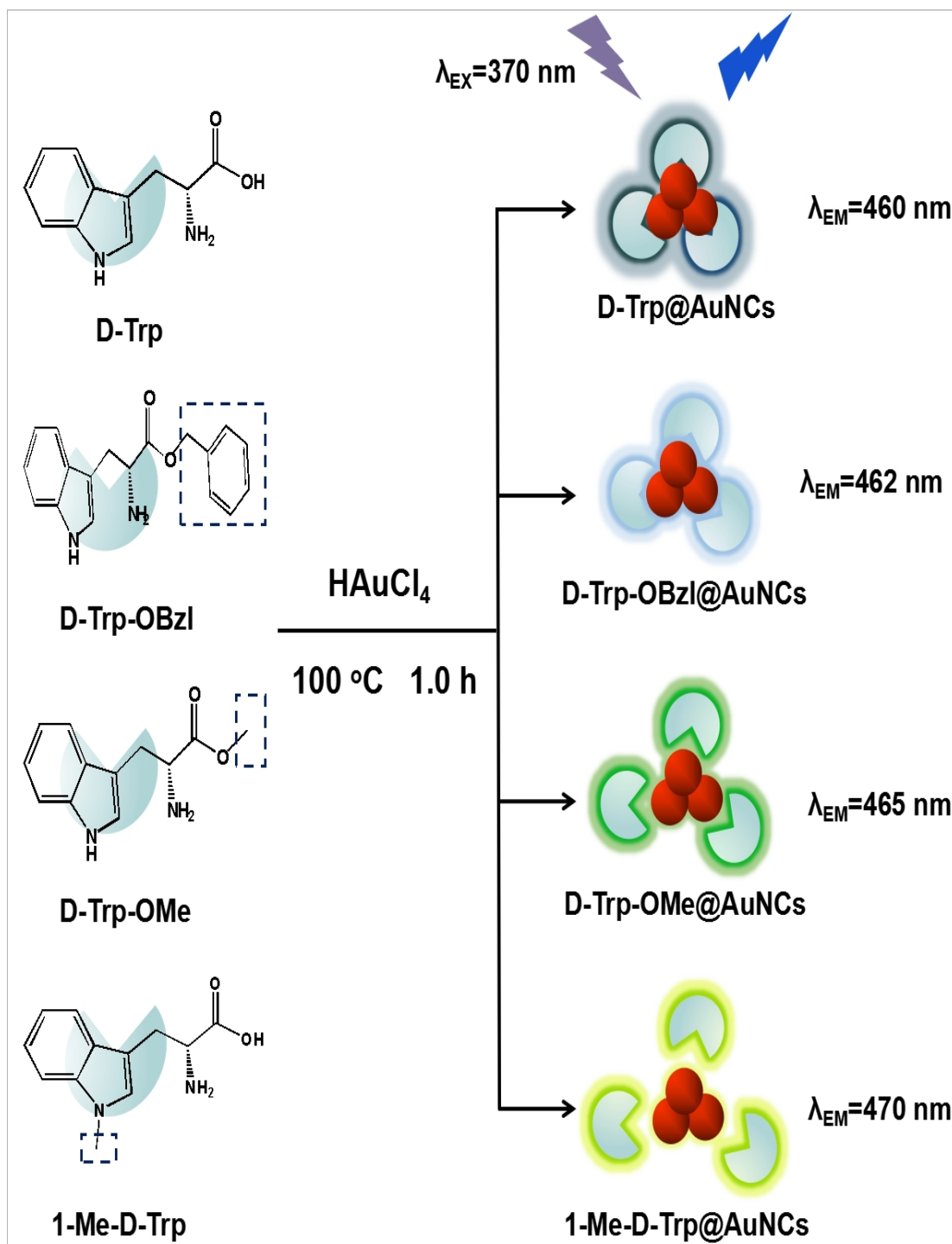


Fig. S1 Synthesis schematic illustration of AuNCs capped with D-Trp, D-Trp-OBzl, D-Trp-OMe and 1-Me-D-Trp, respectively.

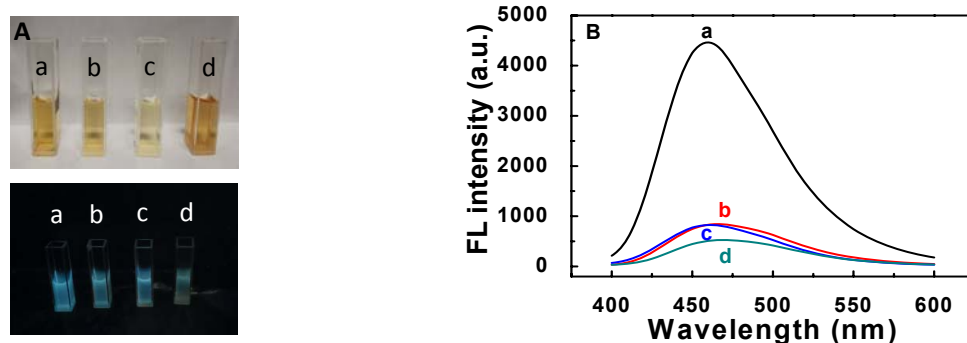


Fig. S2 (A) Photographs of AuNCs capped with D-Trp (a), D-Trp-OMe (b), D-Trp-OBzl (c) and 1-Me-D-Trp (d) from left to right under daylight (upper row) and 365 nm UV irradiation (bottom row); (B) Fluorescence emission spectra of D-Trp@AuNCs (a), D-Trp-OMe@AuNCs (b), D-Trp-OBzl@AuNCs (c) and 1-Me-D-Trp@AuNCs (d).

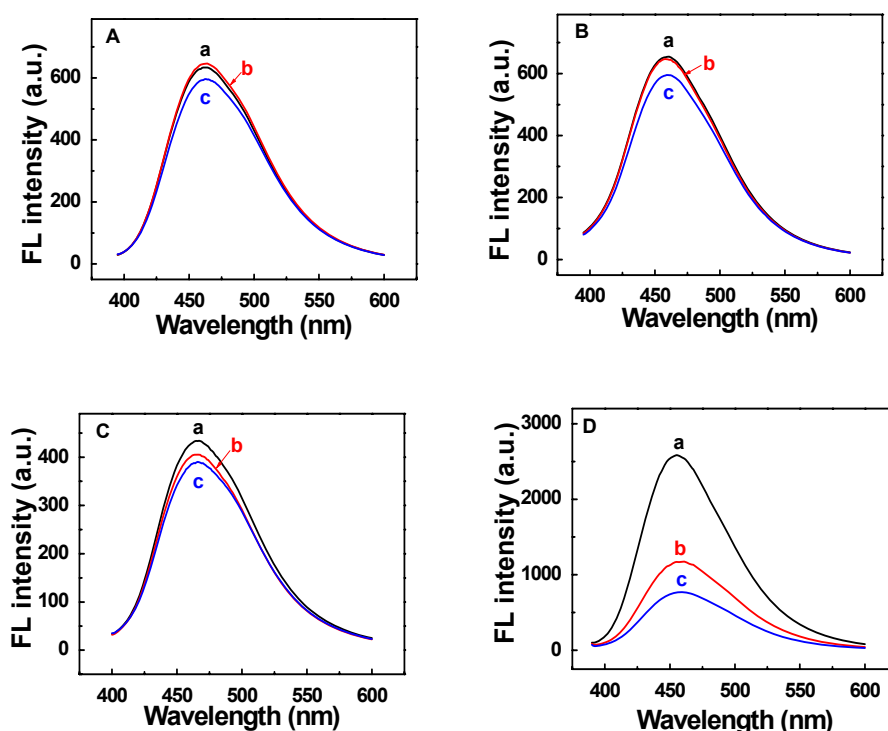


Fig. S3 Fluorescence emission spectra of D-Trp-OMe@AuNCs (A), D-Trp-OBzl@AuNCs (B), 1-Me-D-Trp@AuNCs (C) and D-Trp@AuNCs (D) in the absence and presence of FA (a: 0.0 μ M; b: 25.0 μ M; c: 75.0 μ M).

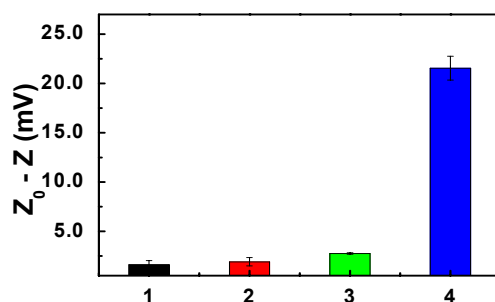


Fig. S4 The zeta potential difference of AuNCs in the absence and presence of FA: 1. D-Trp-OMe@AuNCs, 2. D-Trp-OBzl@AuNCs, 3. 1-Me-D-Trp@AuNCs and 4. D-Trp@AuNCs; where Z_0 and Z are the potentials of AuNCs in the absence and presence of FA, respectively.

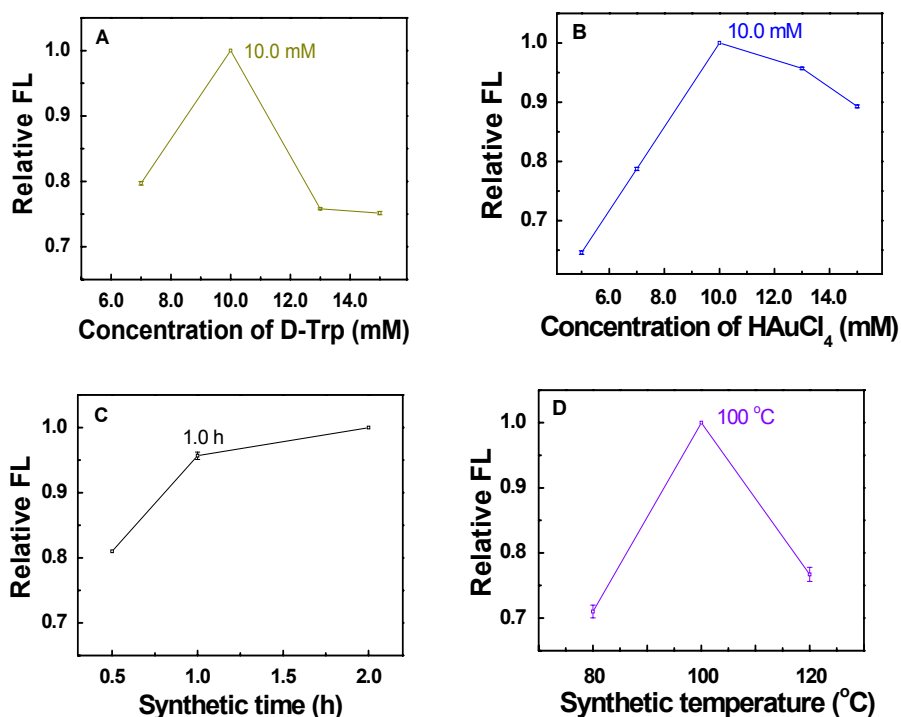


Fig. S5 Effects of concentrations of D-Trp (A), HAuCl₄ (B), synthesis time (C) and synthesis temperature (D) on relative fluorescence intensity of the fluorescent probe.

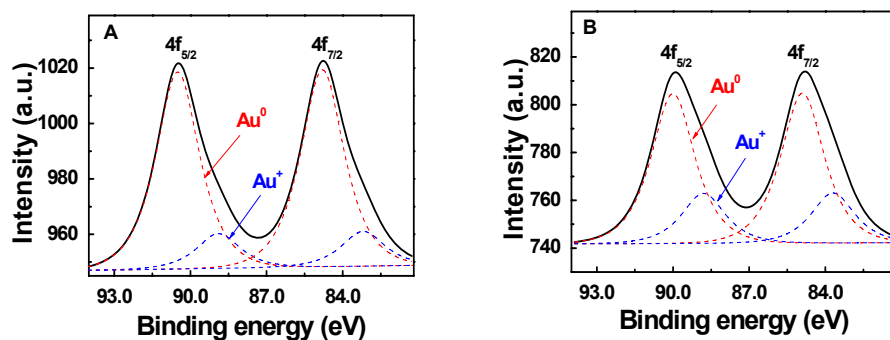


Fig. S6 XPS spectra of Au 4f of D-Trp@AuNCs (A) and D-Trp@AuNCs-FA (B).

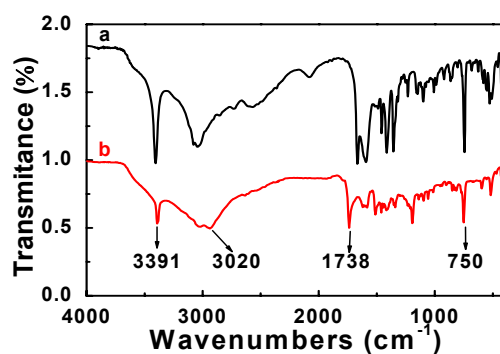


Fig. S7 FT-IR spectrum of D-Trp (a) and D-Trp@AuNCs (b).

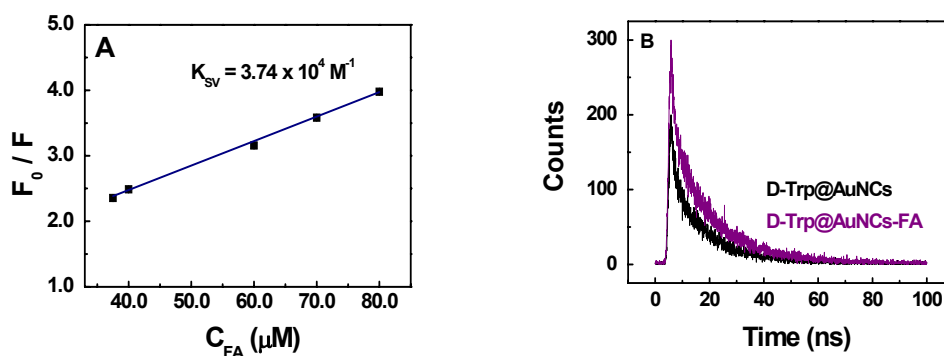


Fig. S8 (A) Stern-Volmer plot of fluorescence quenching; (B) Fluorescence lifetime of D-Trp@AuNCs in the absence and presence of FA.

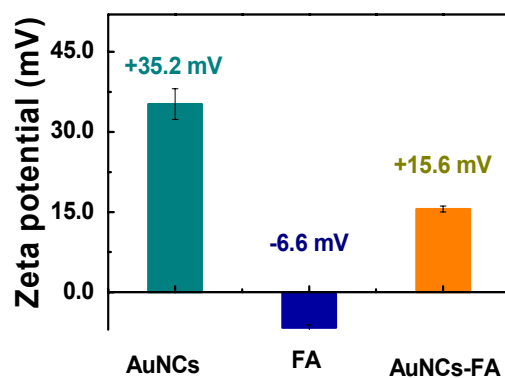


Fig. S9 The zeta potential of D-Trp@AuNCs, FA and D-Trp@AuNCs-FA (pH 7.0).

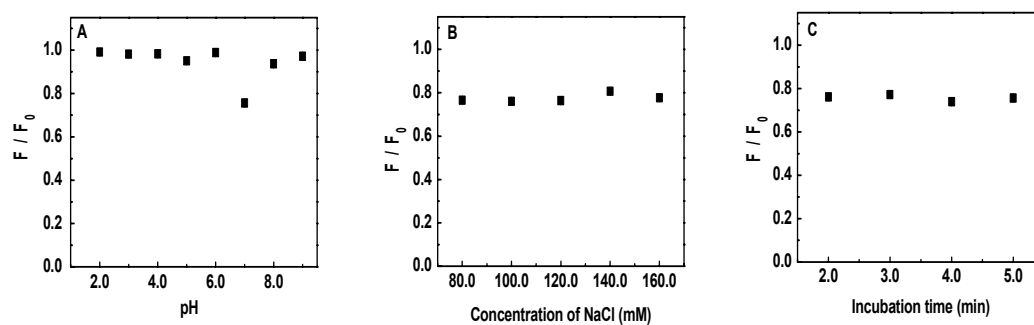


Fig. S10 Effects of pH (A); NaCl concentration (B) and incubation time (C) on F/F_0 .

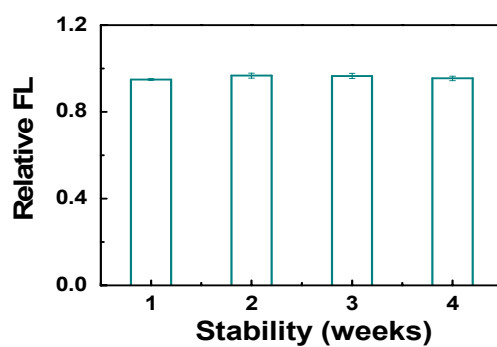


Fig. S11 Stability of the prepared D-Trp@AuNCs.

Table S1 Comparison with the reported AuNCs for detection of FA

AuNCs	Synthesis conditions	Wavelength (nm)		Linear range (μM)	Samples	Ref.
		λ_{EX}	λ_{EM}			
BSA@AuNCs	37 °C 12.0 h	370	629	0.3-75.0	tablets	B. Hemmateenejad, et al. Sens. Actuators B. 2014, 199, 42.
BSA@AuNCs	37 °C 12.0 h	505	652	0.1-2.3	human serum, tablets	X. Yan, et al. Microchim. Acta. 2015, 182, 1281.
BSA@AuNCs	37 °C 24.0 h	350	640	0.2-226.6	tumor cells	H. C. Li, et al. Talanta. 2016, 158, 118.
MUA@AuNCs	RT 5.0 h	280	612	0.0-20.0	human serum	L. Meng, et al. RSC Adv. 2018, 8, 9327.
D-Trp@AuNCs	100 °C 1.0 h	370	460	6.3-100.0	human urine	This work