

Supporting Information

The development of simple and sensitive small-molecule
fluorescent probes for the detection of serum proteins after
native PAGE

Fangfang Wang^a, Lingyun Huang^b, Na Na^a, Dacheng He^b, Dezhi Sun^c, Jin Ouyang^{a,*}

College of Chemistry, Beijing Normal University, Beijing 100875, China

The preparation of 4-amino-4'-dimethylaminochalcone (ADMAC): ADMAC was synthesized by a typical method referred in the literature with some modifications [1]. A solution of p-aminoacetophenone (3.0 g) in anhydrous ethanol (10 mL) was added under magnetic stirring to a prepared solution of sodium hydroxide (1.0 g) in water (10 mL); next, a solution of 4-dimethylaminobenzaldehyde (3.2 g) in anhydrous ethanol (12 mL) was added by dropwise to the above mixture. The solution was stirred at 25°C for 24 h and then filtrated, and a brown-orange solid was given. Finally, the solid was added to 20 mL deionized water, filtrated after standing overnight, and then washed with deionized water two times. After drying, the coarse products were recrystallized in toluene and gave 4.5 g (73%) of an orange powder.

¹HNMR ([D₆] DMSO): δ=6.58-7.88 (10H, CH), 6.01 (2H, NH₂), 2.97 (6H, CH₃)

Preparation of 2-hydroxy-4'-dimethylaminochalcone (HDMAC): The synthetic route of HDMAC was same as that of ADMAC. After filtration, washing and drying, the coarse products were recrystallized in ethanol and gave 3.3 g (53%) of an orange red powder. ¹HNMR ([D₆] DMSO): δ=13.14 (1H, OH), 6.74-8.23 (10H, CH), 3.02 (6H, CH₃).

Preparation of 4-methoxy-4'-dimethylaminochalcone (MODMAC): The synthetic route of HDMAC was same as that of ADMAC. After filtration, washing and drying, the coarse products were recrystallized in ethanol and gave 5.3 g (85%) of a yellowish-green powder. ¹HNMR ([D₆] DMSO): δ=6.72-8.12 (10H, CH), 3.85 (3H, OCH₃), 6.15 (6H, N(CH₃)₂).

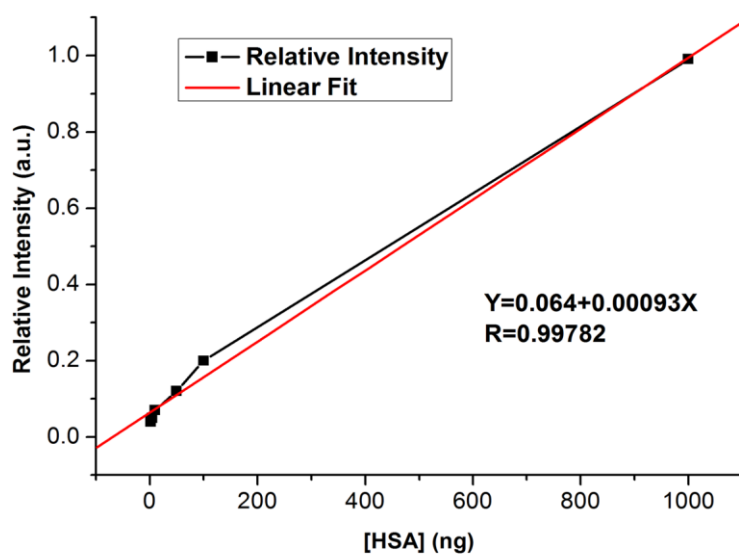


Figure S1. The relationship between the relative fluorescent intensity of the scanned bands and the HSA in the solution

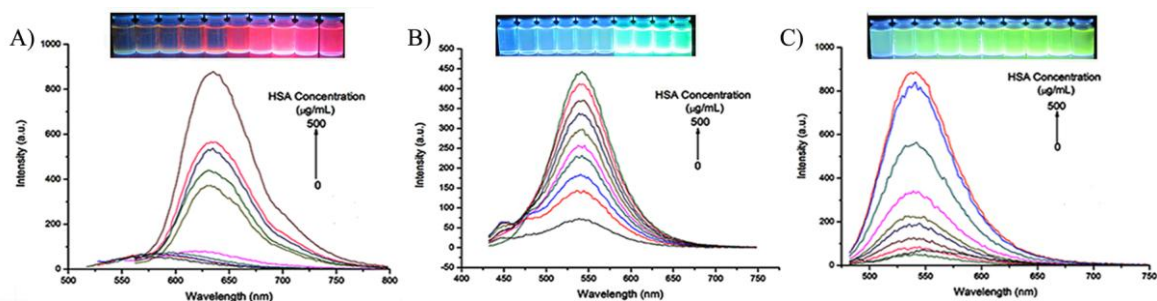


Figure S2. Effect of increasing concentration of HSA (curves 1→10 correspond to [HSA] (in $\mu\text{g mL}^{-1}$) = 0, 50, 100, 150, 200, 250, 300, 350, 400, 500) on the fluorescence spectra of A) HDMAC, B) ADMAC and C) MODMAC ([probe]=3.5 μM).

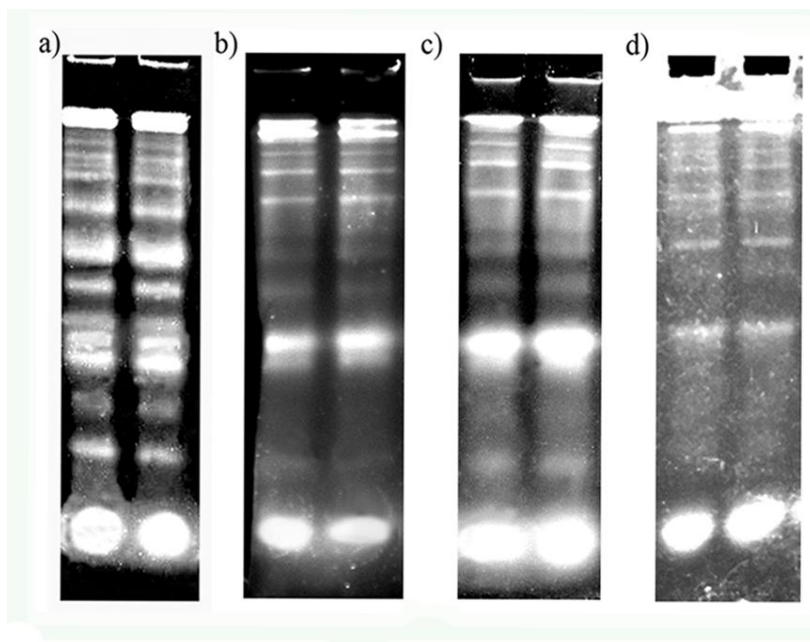


Figure S3. Detection of human serum after 1-D PAGE (a for DHDMAC-based fluorescent imaging, b for ADMAC-based fluorescent imaging, c for HDMAC-based fluorescent imaging, and d for MODMAC-based fluorescent imaging).

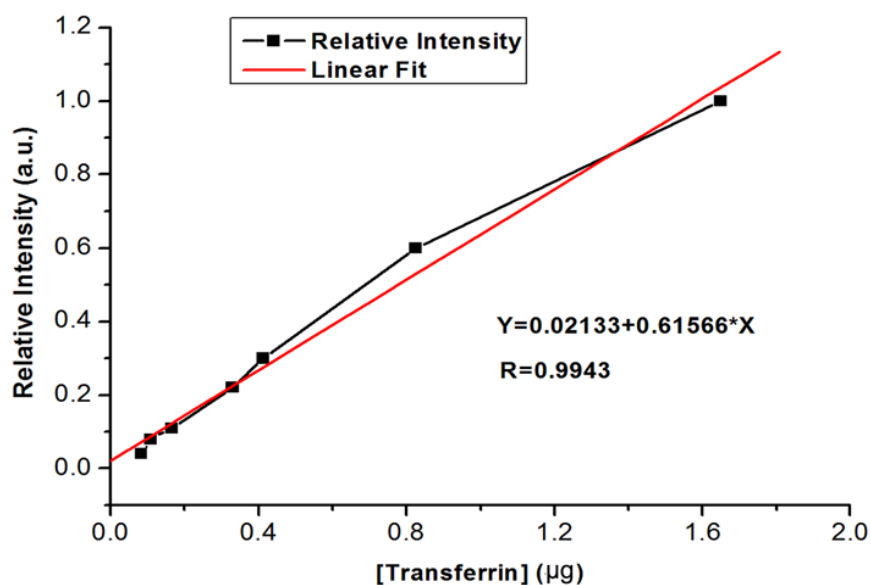


Figure S4. The relationship between the relative fluorescent intensity of the scanned bands and the transferrin in the gel.

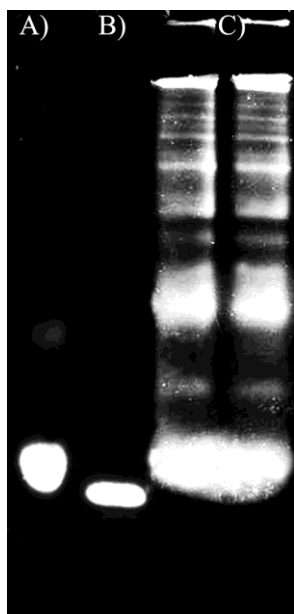


Figure S5. DHDMAC-based fluorescent imaging of (a) HSA, (b) Pepsin and (c) human serum

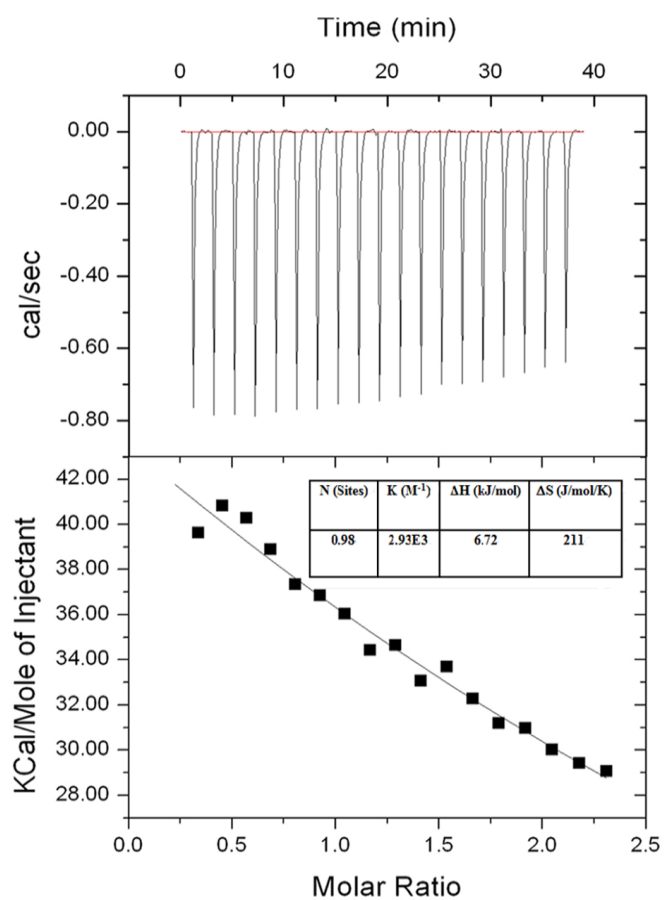


Figure S6. Isothermal titration calorimetry profile for the binding of HSA and DHDMAC

References

- [1] C. G. Niu, A. L. Guan, G. M. Zeng, Y. G. Liu, Z. W. Li, *Analytica Chimica Acta* 2006, **577**, 264.