Supplementary information

A fluorescent probe based on the interaction of ofloxacin with gold nanoparticles for the sensitive detection of melamine

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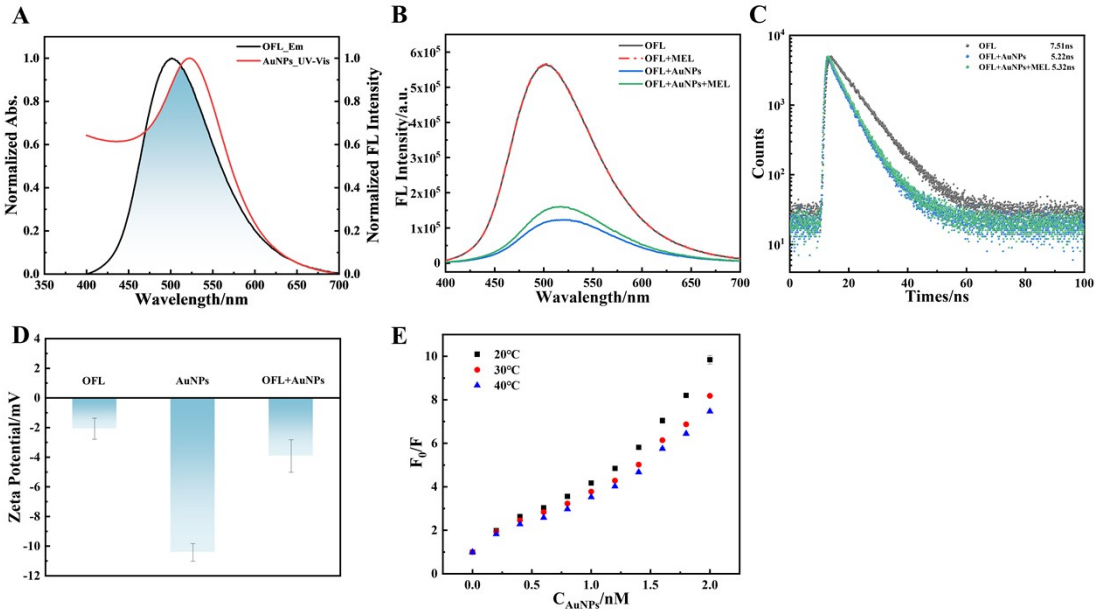

Fig. S1 pH=5.5: (A) UV–Vis absorption spectrum of AuNPs and fluorescence emission spectrum of OFL (λex = 292 nm). (B) Fluorescence emission spectra of OFL, OFL + MEL, OFL + AuNPs and OFL + AuNPs + MEL (λex = 292 nm). (C) Zeta potentials of OFL, OFL + AuNPs and OFL + AuNPs + MEL. (D) Fluorescence decay plots of OFL, OFL + AuNPs and OFL + AuNPs + MEL. (E) Stern-Volmer plot of the OFL after the addition of AuNPs with various concentrations

In order to investigate the fluorescence quench mechanism of OFL after adding different concentrations of AuNPs, it is usually interpreted by the Stern-Volmer equation.:

$$F_0 / F = 1 + Ksv[Q]$$

where F_0 and F are the fluorescence intensity before and after quenching, respectively, Ksv is the Stern–Volmer quenching constant, and Q is the concentration of the quencher. As demonstrated in Fig. S1E, no significant linear relationship exists between (F_0/F) and AuNPs concentrations. Consequently, it can be inferred that the fluorescence quenching of OFL by AuNPs involves mechanisms beyond mere dynamic quenching.

Fit the modified Stern-Volmer equation to the experimental data using nonlinear regression analysis：

$$\frac{F_0}{F} = (1 + K_{sv}[Q])(1 + K_S[Q]) = 1 + (K_{sv} + K_S)[Q] + K_{sv}K_S[Q]^2$$

where F_0 and F are the fluorescence intensity before and after quenching, respectively, Ksv is the dynamic quenching constant, Ks is static quenching constant, and Q is the concentration of the quencher.

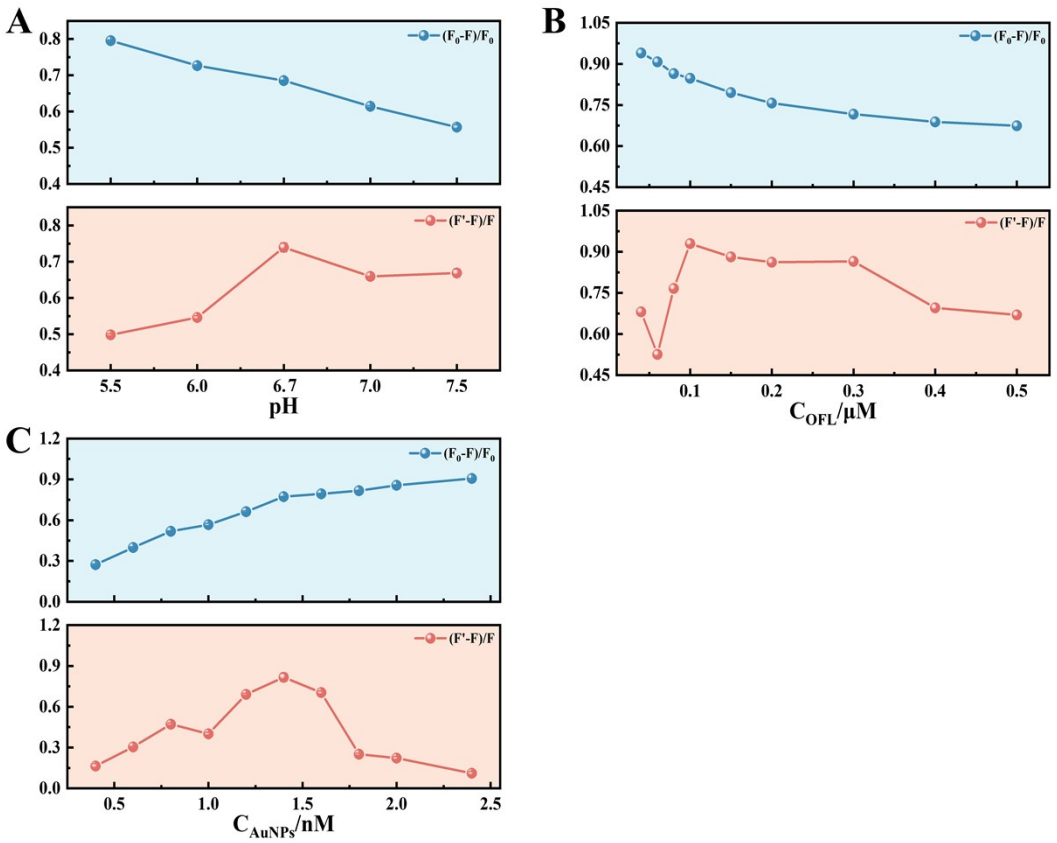

Fig. S2 (A) The fluorescence quenching efficiency of OFL + AuNPs in different pH conditions and the fluorescence enhancement efficiency of OFL + AuNPs + MEL in different pH conditions (C_{OFL} = 0.2 μM, C_{AuNPs} = 1.40 nM, C_{MEL}= 0.5 μM). (B) The relationship between the fluorescence quenching efficiency of OFL + AuNPs and the fluorescence enhancement efficiency of OFL + AuNPs + MEL and the concentration of OFL(C_{AuNPs} = 1.40 nM, C_{MEL}= 0.5 μM). (C) The relationship between the fluorescence quenching efficiency of OFL + AuNPs and the fluorescence enhancement efficiency of OFL + AuNPs + MEL and the concentration of AuNPs(C_{OFL} = 0.1 μM, C_{MEL}= 0.5 μM)

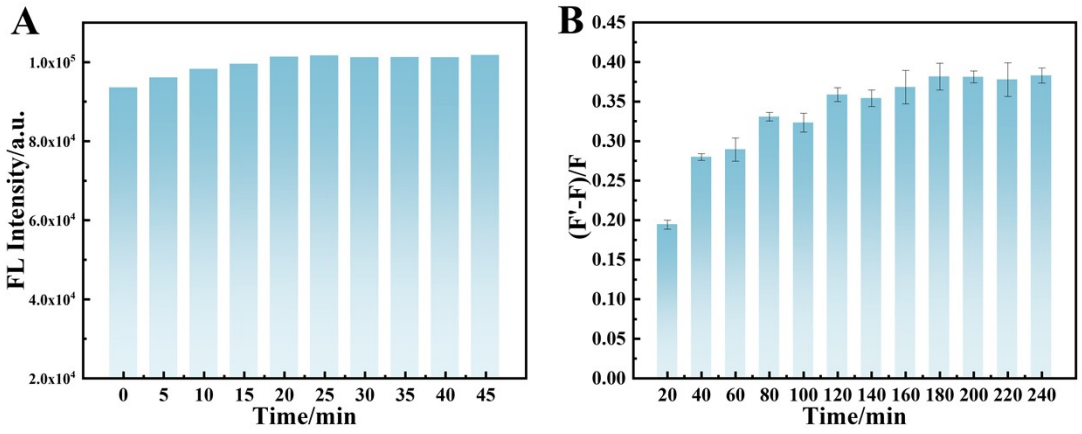

Fig. S3 Optimization of incubation time. (A) The relative fluorescence intensities of OFL + AuNPs within 0-45 min. (B) The relative fluorescence intensities of OFL + AuNPs +MEL in 240 min (C_{AuNPs} = 1.40 nM)

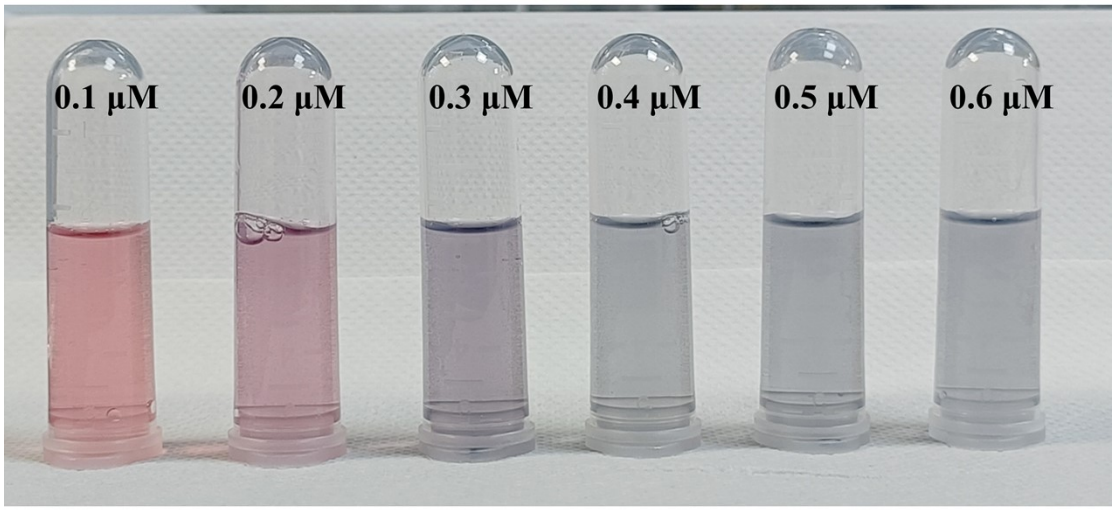

Fig. S4 Visual detection of MEL