

Supporting Information

**A  $\text{Eu}^{3+}/\text{Tb}^{3+}$ -functionalized MOF ratiometric fluorescence sensor for ciprofloxacin detection and its agarose hydrogel for anti-counterfeiting application**

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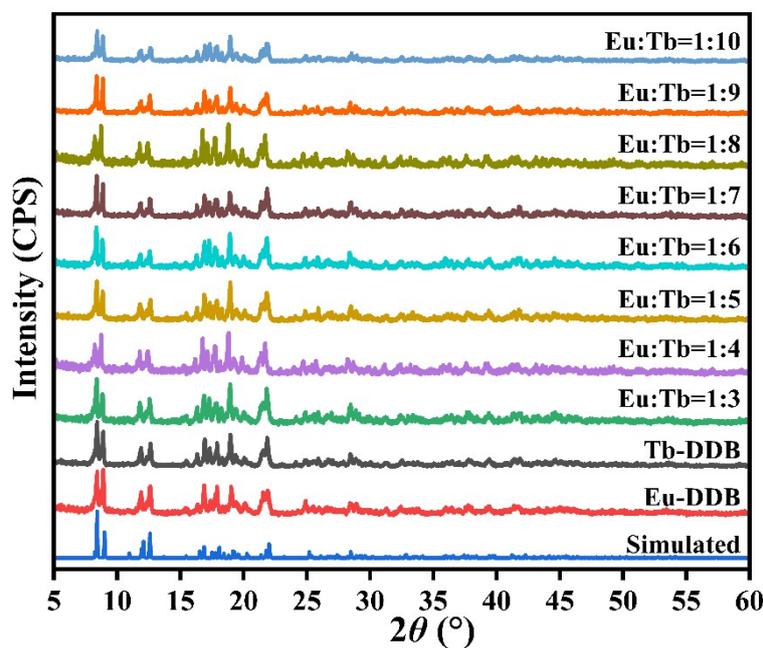


Fig. S1. PXRD patterns of Eu-DDB, Tb-DDB and  $\text{Eu}_x\text{Tb}_{1-x}$ -DDB with  $n_{\text{Eu}}/n_{\text{Tb}} = 1:3-1:10$ .

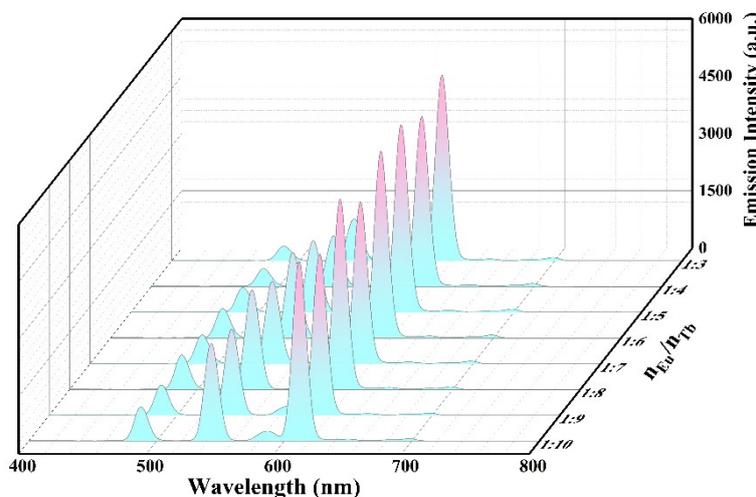
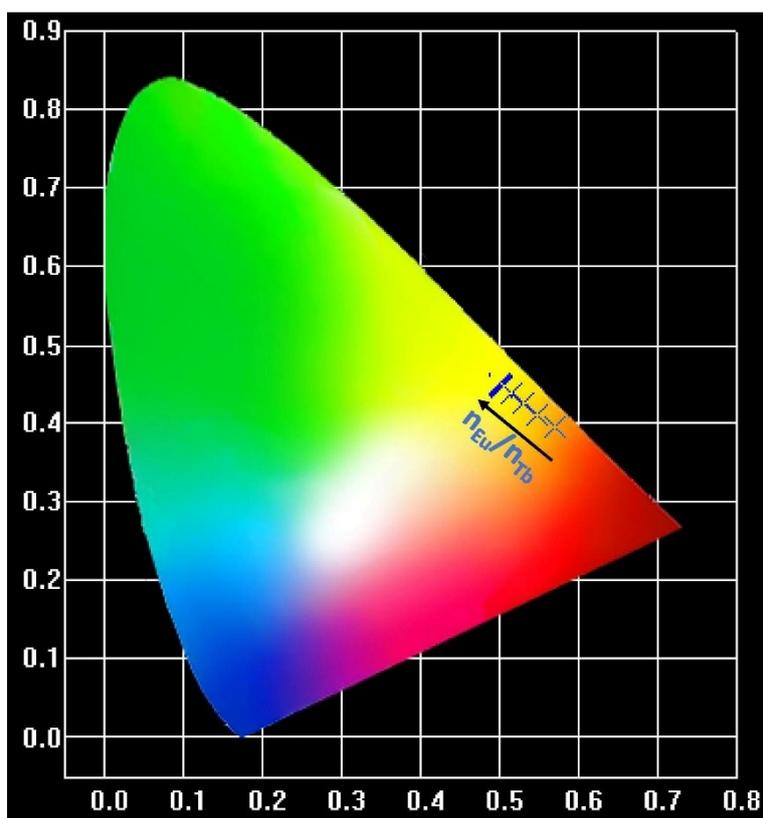
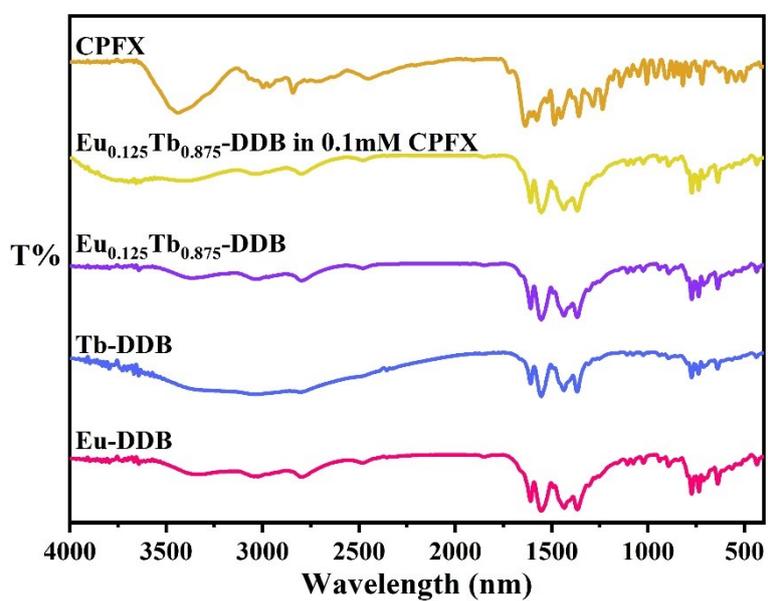


Fig. S2. Liquid-state fluorescence of  $1 \text{ mg}\cdot\text{mL}^{-1}$   $\text{Eu}_x\text{Tb}_{1-x}$ -DDB with  $n_{\text{Eu}}/n_{\text{Tb}}$  ratio = 1:3-1:10.



**Fig. S3.** The CIE 1931 chromaticity diagram of  $Eu_xTb_{1-x}$ -DDB with  $n_{Eu}/n_{Tb}$  ratio = 1:3-1:10.



**Fig. S4.** FT-IR of CPFX, Eu-DDB, Tb-DDB,  $Eu_{0.125}Tb_{0.875}$ -DDB, and  $Eu_{0.125}Tb_{0.875}$ -DDB immersed in 0.1 mM CPFX.

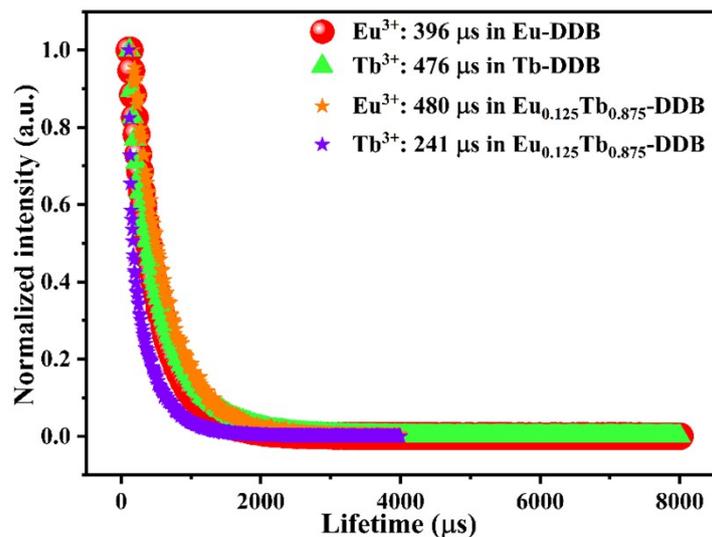


Fig. S5. FLTs of  $\text{Eu}^{3+}$  and/or  $\text{Tb}^{3+}$  in Eu-DDB, Tb-DDB, and  $\text{Eu}_{0.125}\text{Tb}_{0.875}$ -DDB.

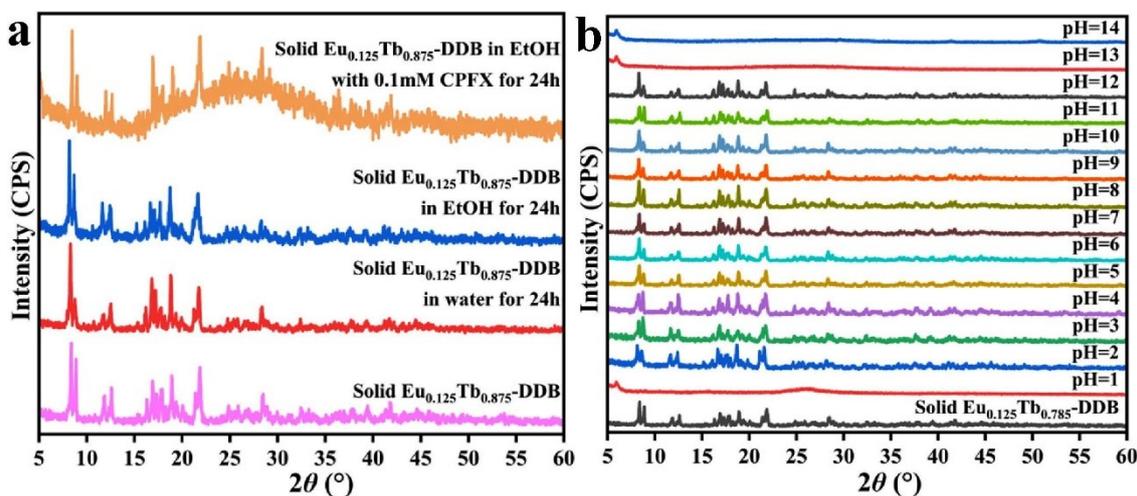


Fig. S6. PXRD patterns of  $\text{Eu}_{0.125}\text{Tb}_{0.875}$ -DDB immersed in water, EtOH, 0.1 mM CPFY (a), and HCl or NaOH solutions at pH = 1-14 (b).

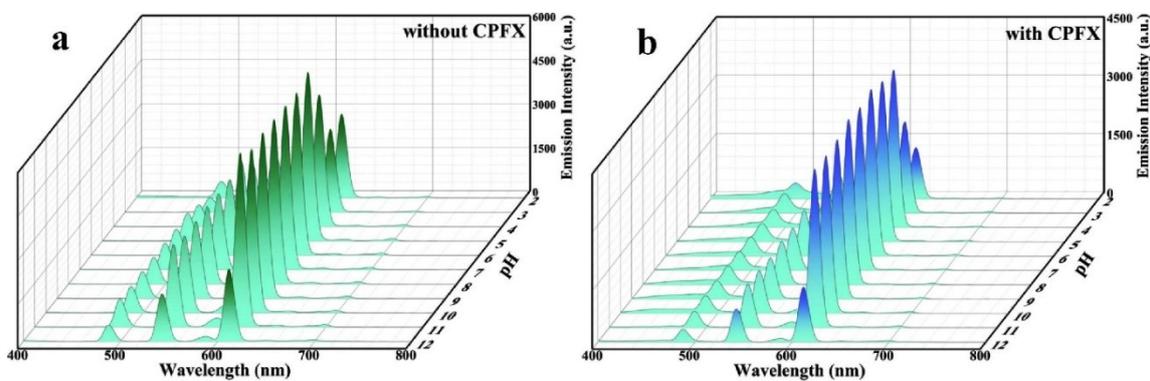
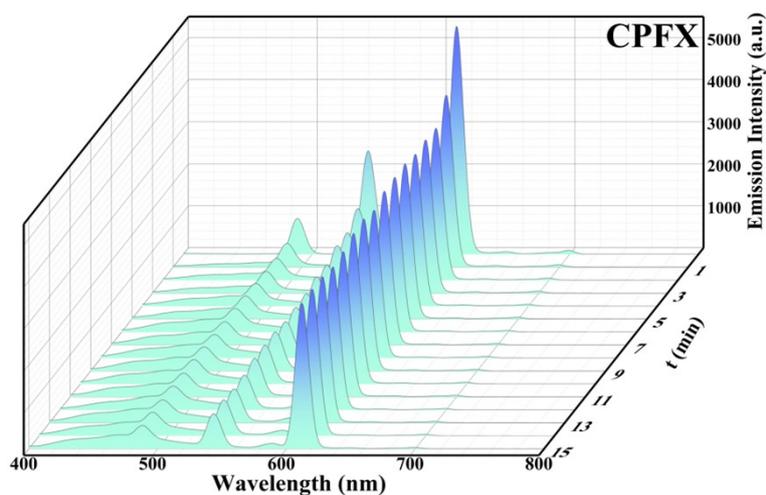
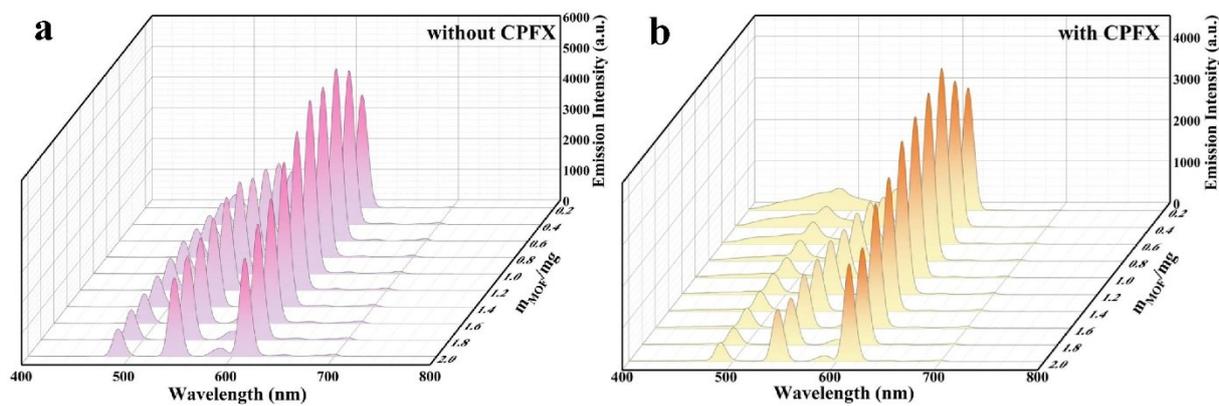


Fig. S7. The liquid-state fluorescence spectra of blank  $\text{Eu}_{0.125}\text{Tb}_{0.875}$ -DDB (a) and  $\text{Eu}_{0.125}\text{Tb}_{0.875}$ -DDB sensing CPFY (b) at pH = 2-12.



**Fig. S8.** Liquid-state fluorescence spectra of  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  sensing 0.1 mM CPFX under 254 nm UV light irradiation for 1-15 min.



**Fig. S9** The liquid-state fluorescence spectra of 0.2-2.0 mg blank  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  (a) and 0.2-2.0 mg  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  sensing 0.1 mM CPFX (b).

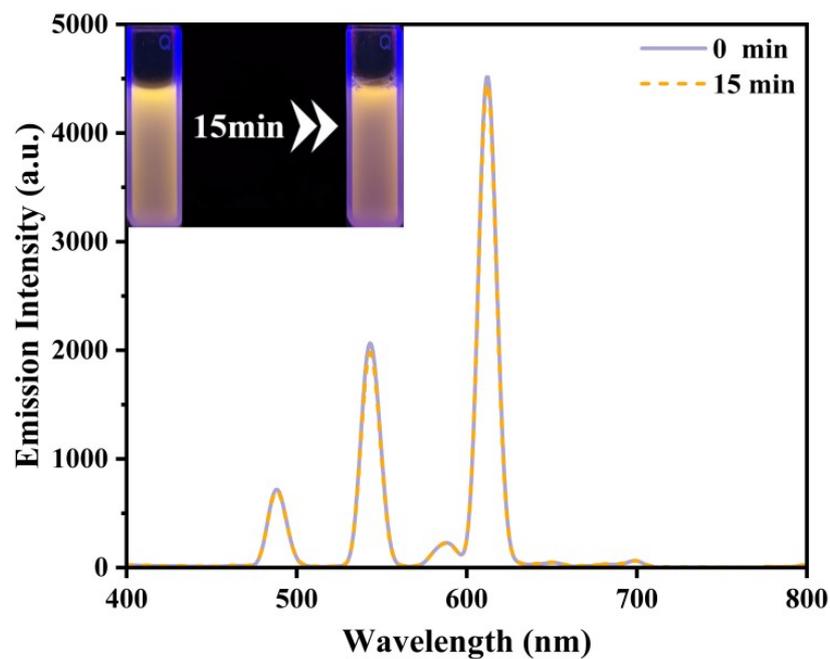


Fig. S10. The liquid-state fluorescence of  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  before and after 15-min standing.

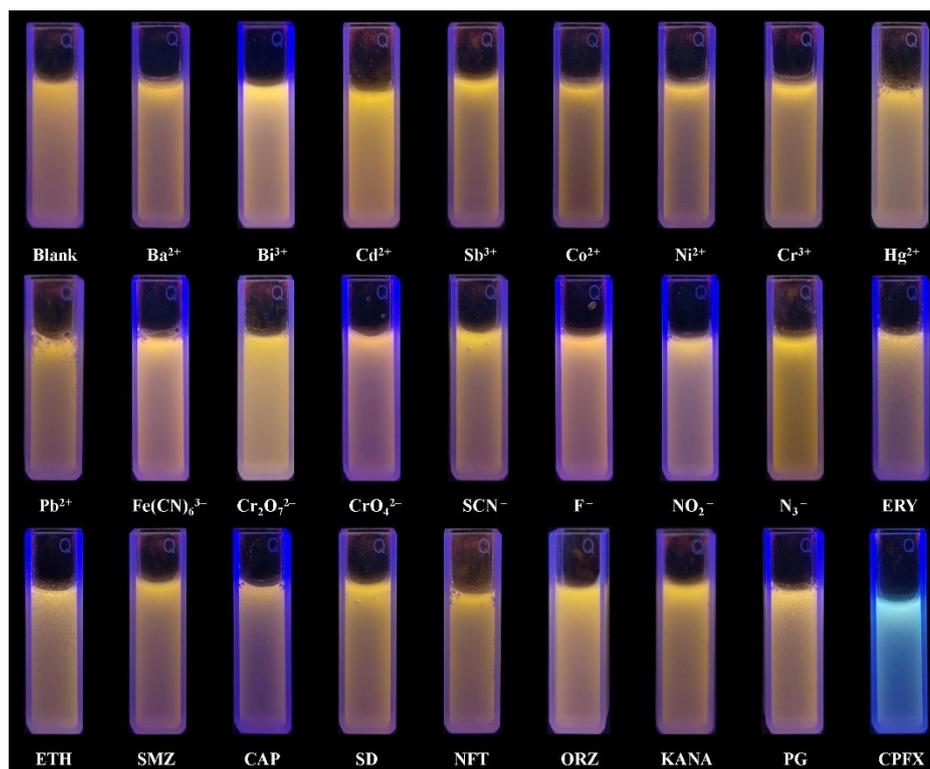
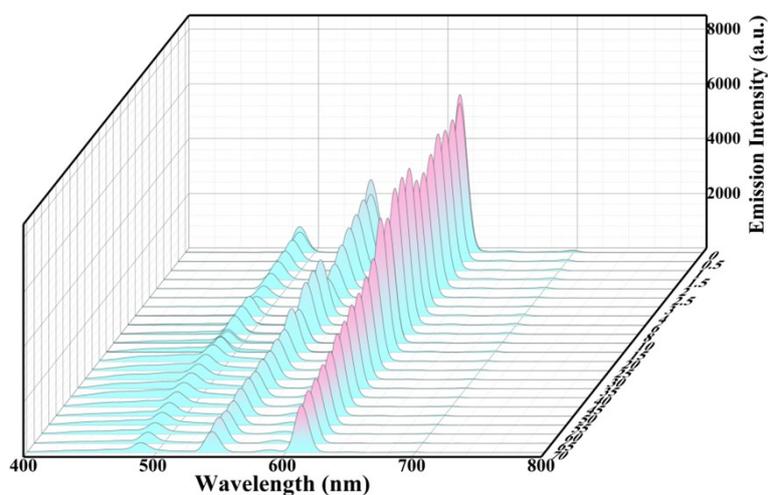
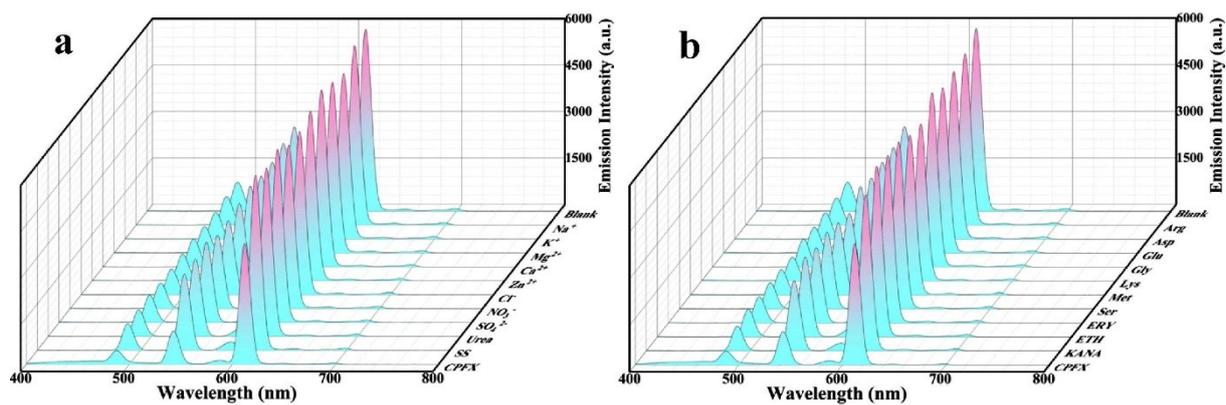


Fig. S11. Photos of  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  sensing common cations, anions, antibiotics, and CPF.



**Fig. S12.** Liquid-state fluorescence of  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  sensing CPFY with  $C_{\text{CPFY}} = 0.5\text{-}70$   $\mu\text{M}$ .



**Fig. S13.** Liquid-state fluorescence of  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  sensing 0.1 mM CPFY and contrast compounds of  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Cl}^-$ ,  $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ , urea, and SS (a), and Arg, Asp, Glu, Gly, Lys, Met, Ser, ERY, ETH, and KANA (b).

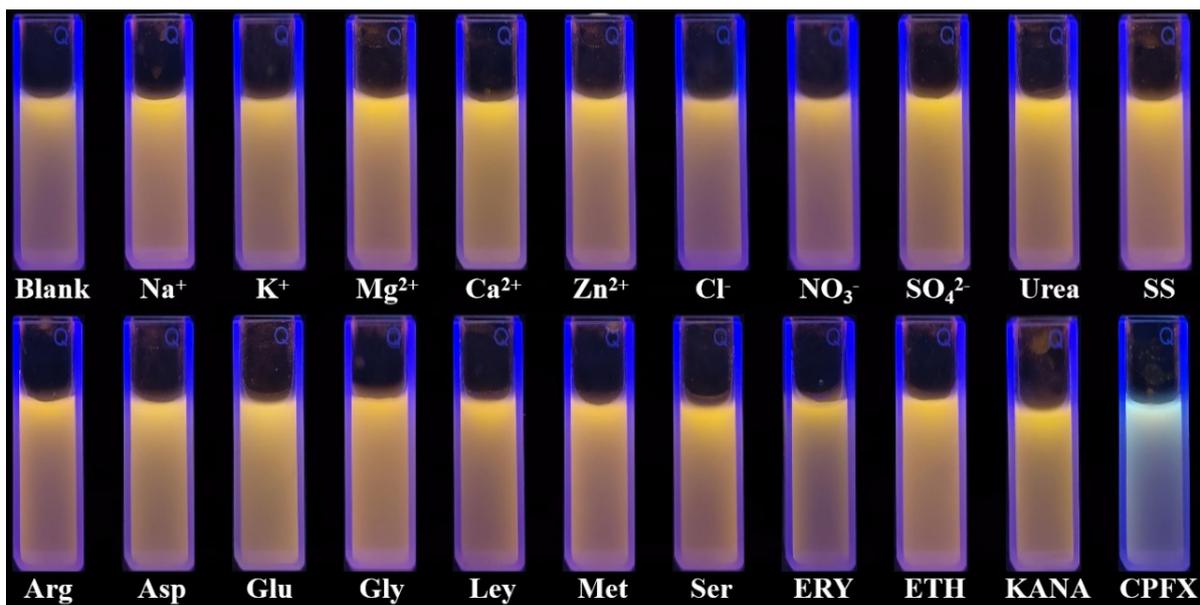


Fig. S14. The images of  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  sensing CPF and contrast compounds.

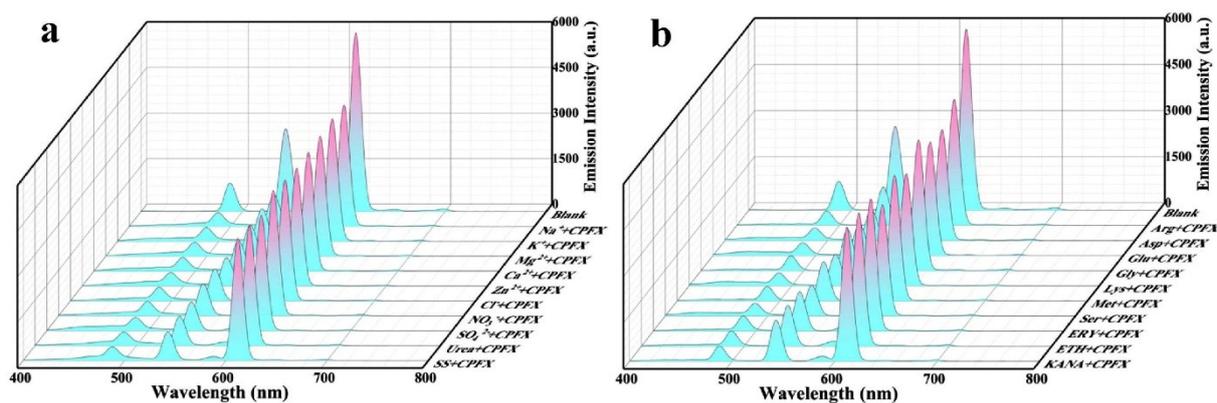
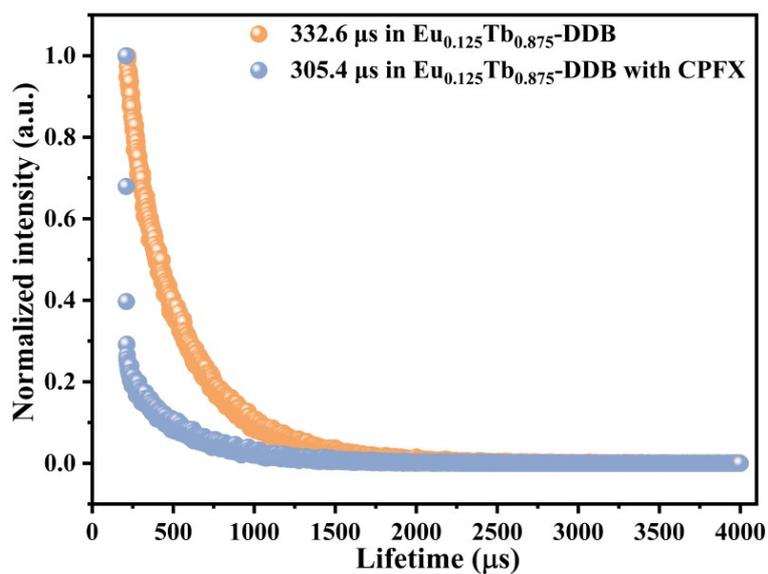
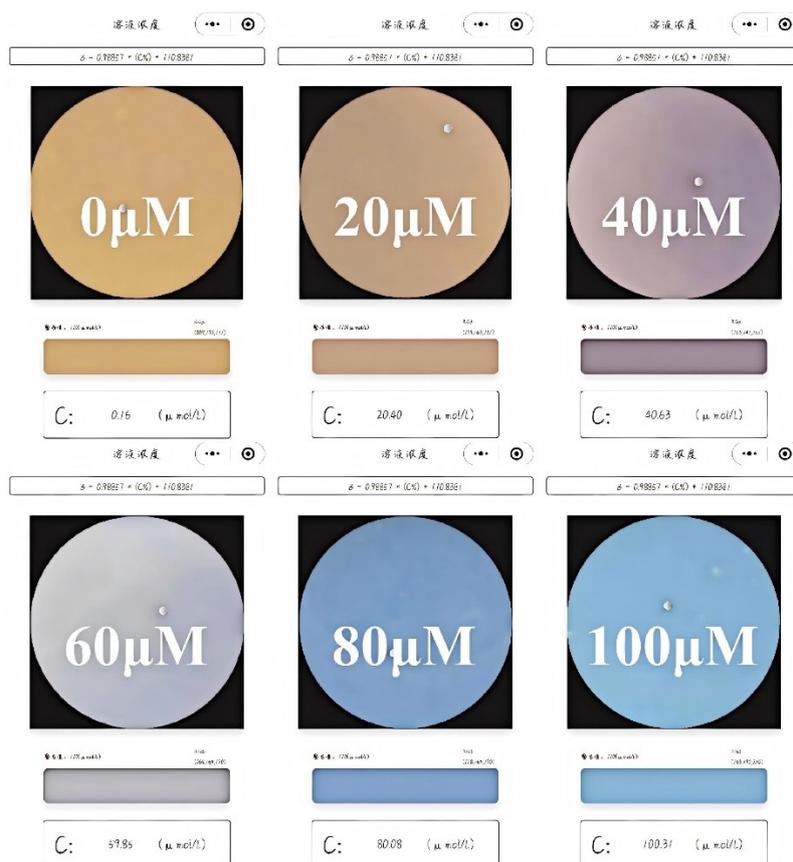


Fig. S15. Liquid-state fluorescence of  $\text{Eu}_{0.125}\text{Tb}_{0.875}\text{-DDB}$  sensing 0.1 mM CPF and control compounds of  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Cl}^-$ ,  $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ , urea, SS (a), Arg, Asp, Glu, Gly, Lys, Met, Ser, ERY, ETH, and KANA (b).



**Fig. S16.** FLTs of  $\text{Eu}^{3+}$  and  $\text{Tb}^{3+}$  in blank  $\text{Eu}_{0.125}\text{Tb}_{0.875}$ -DDB suspension and  $\text{Eu}_{0.125}\text{Tb}_{0.875}$ -DDB suspension sensing CPFY.



**Fig. S17.** The screenshot images of  $\text{Eu}_{0.125}\text{Tb}_{0.875}$ -DDB@ agarose sensing CPFY by smartphone APP.