

## Supporting Information

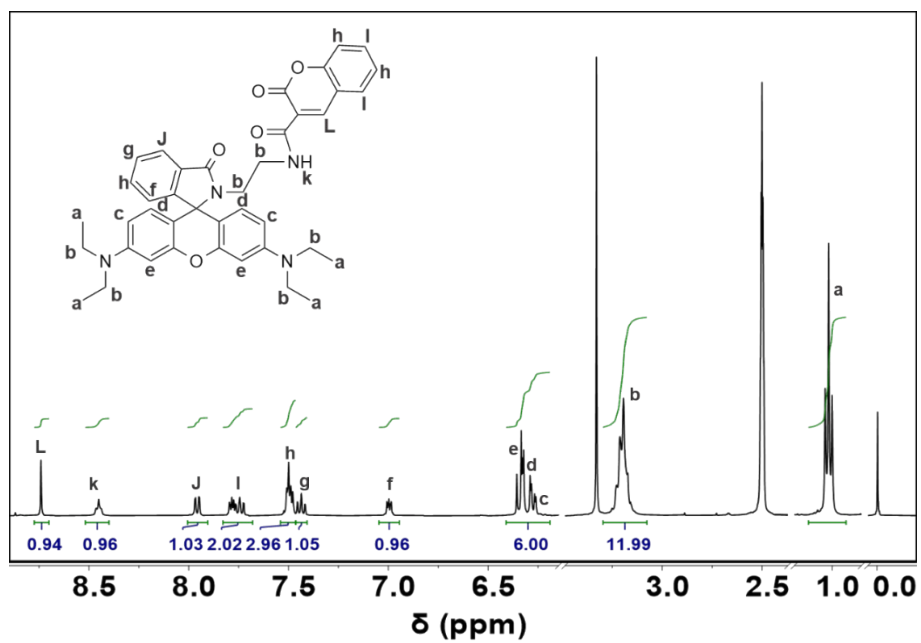
### **A rhodamine coumarin-derived fluorescence probe that selectively detects Fe<sup>3+</sup> and measures radiation doses**

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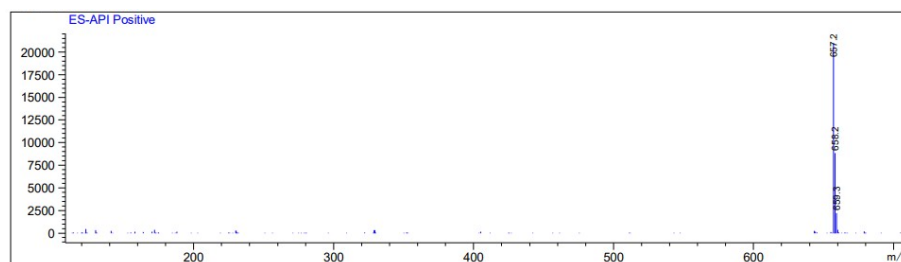
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**Figure S1.** <sup>1</sup>H NMR spectrum of REC.



**Figure S2.** LCMS spectrum of REC.

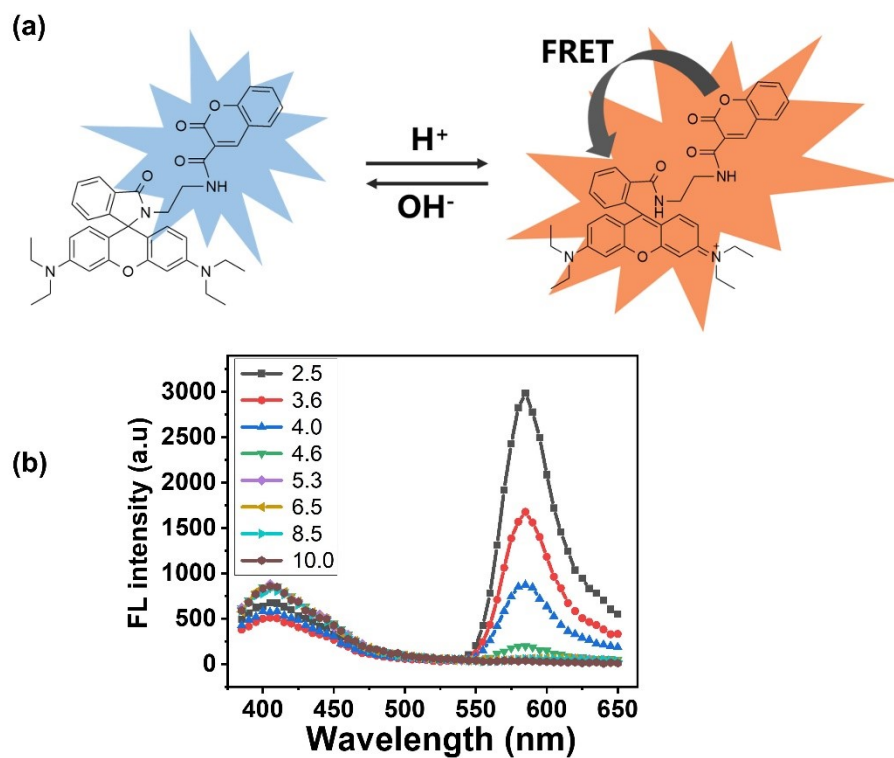


Figure S3. (a) Schematic illustration of the mechanism and (b) the fluorescence spectra of REC at different pHs.

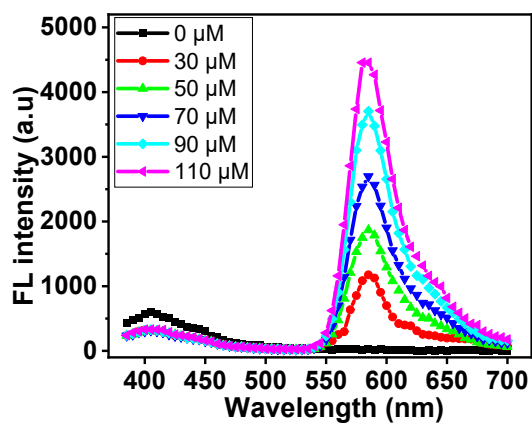


Figure S4. Fluorescence spectra of REC as a function of increasing  $Fe^{3+}$  concentration.

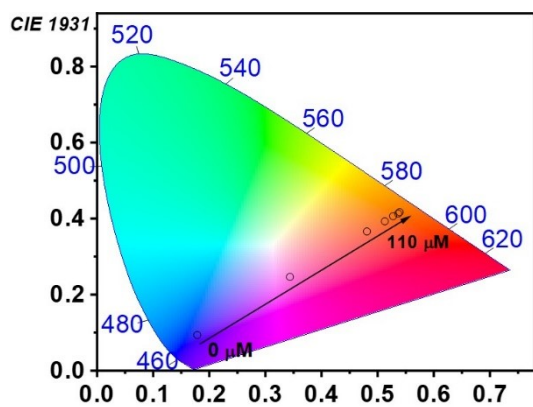


Figure S5. CIE 1931 of REC as a function of increasing  $\text{Fe}^{3+}$  concentration.

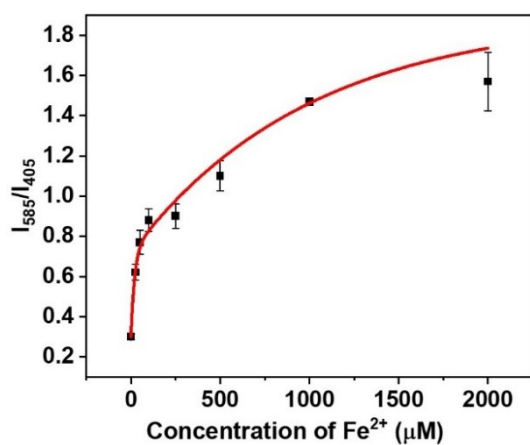


Figure S6. Change in  $I_{585}/I_{405}$  as a function of increasing  $\text{Fe}^{2+}$  concentration.

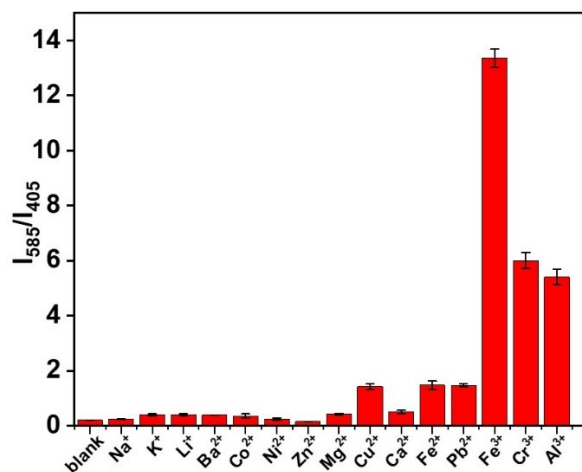


Figure S7.  $I_{585}/I_{405}$  of REC solution responding to different metal ions. Interfering metal ions:  $1100 \mu\text{M}$ ,  $\text{Fe}^{3+}$ :  $110 \mu\text{M}$ .

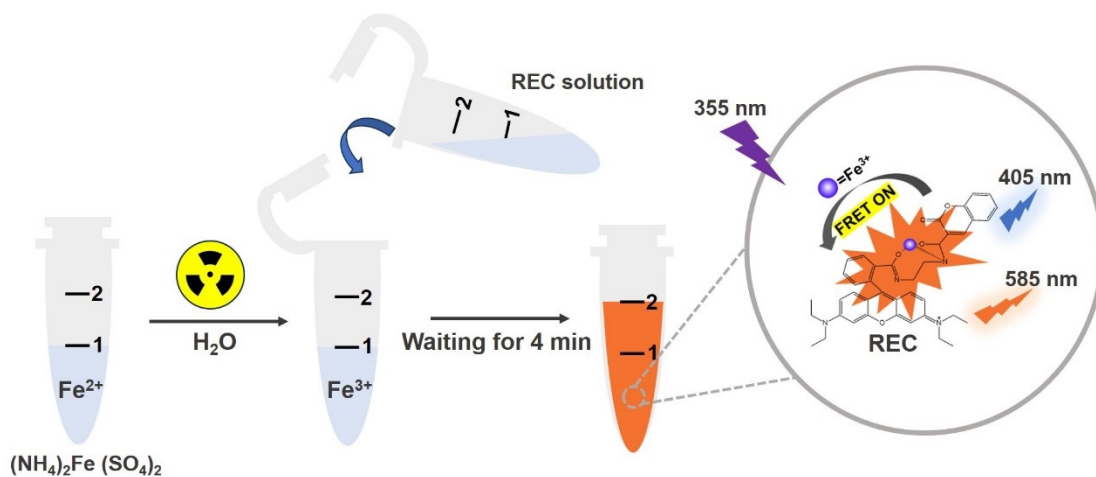


Figure S8. Schematic illustration of the mechanism of REC for sensing X-ray doses.

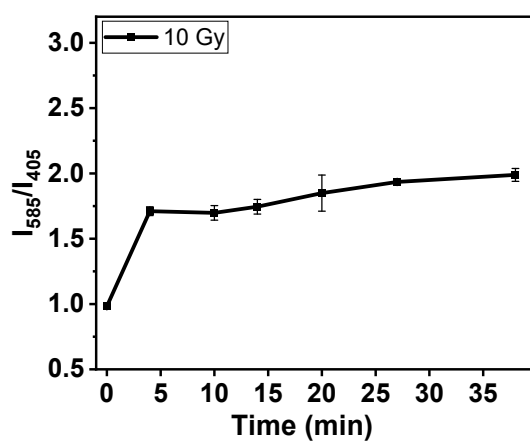


Figure S9. Reaction kinetics of REC probe with 10 Gy irradiated Fe<sup>2+</sup>.

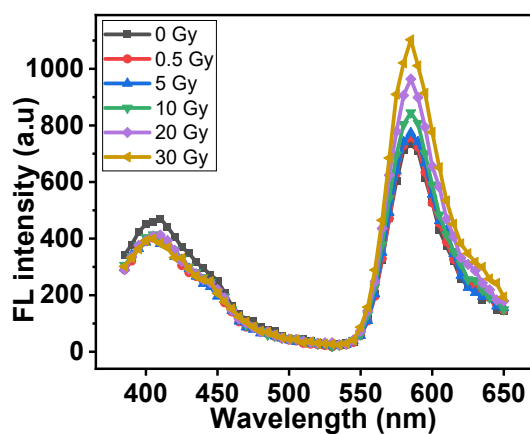


Figure S10. Fluorescence spectra of REC probe with different X-ray doses.

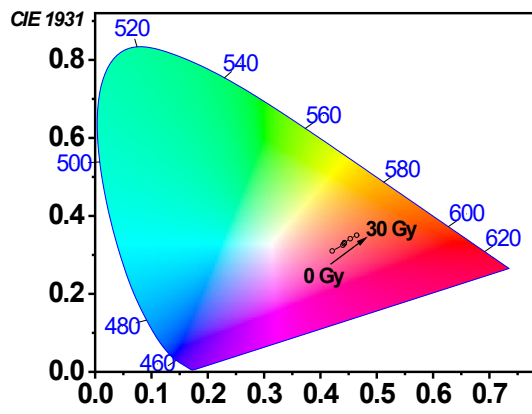


Figure S11. CIE 1931 plot of REC probe with different X-ray doses.