

**Engineering of a GSH activatable photosensitizer for enhanced photodynamic therapy through  
disrupting redox homeostasis**

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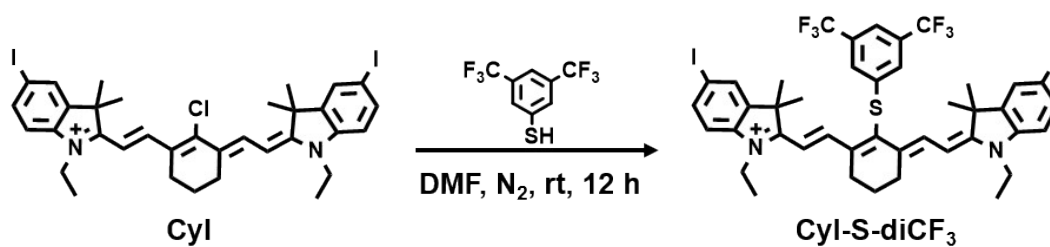
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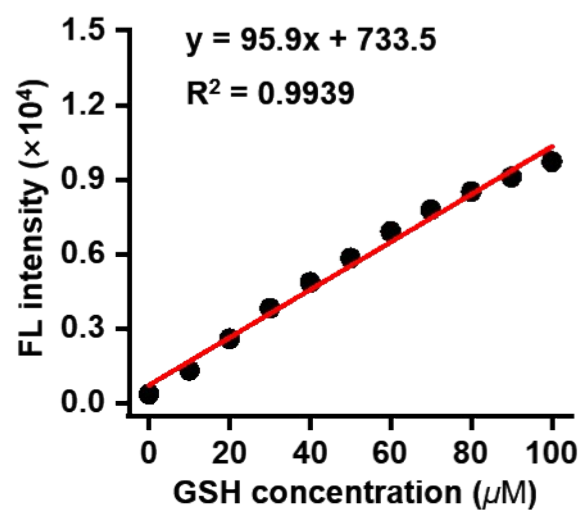
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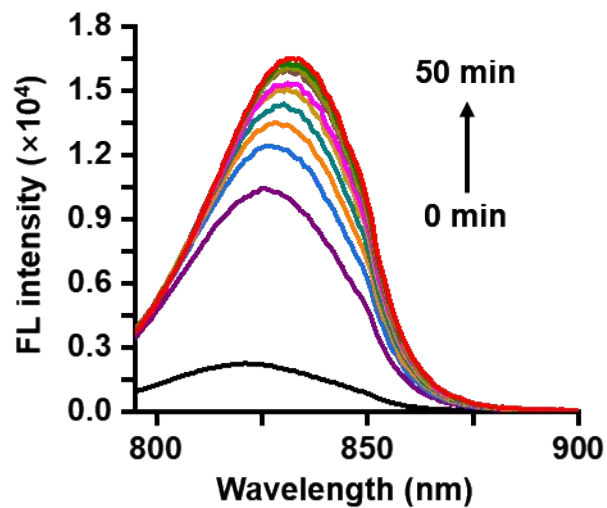
<sup>1</sup> These authors contribute equally to this work.



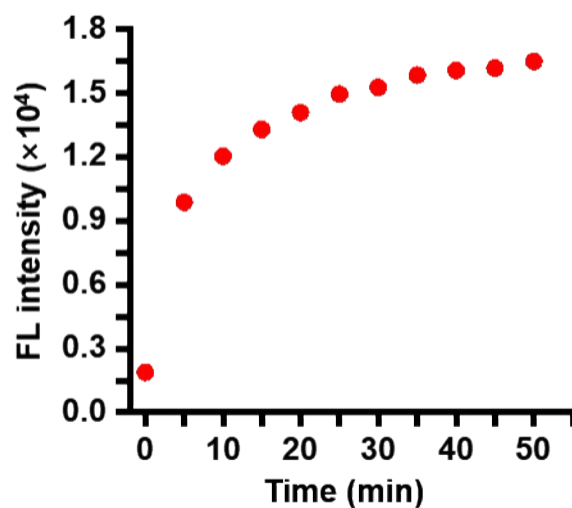
**Fig. S1** The synthesis route of CyI-S-diCF<sub>3</sub>.



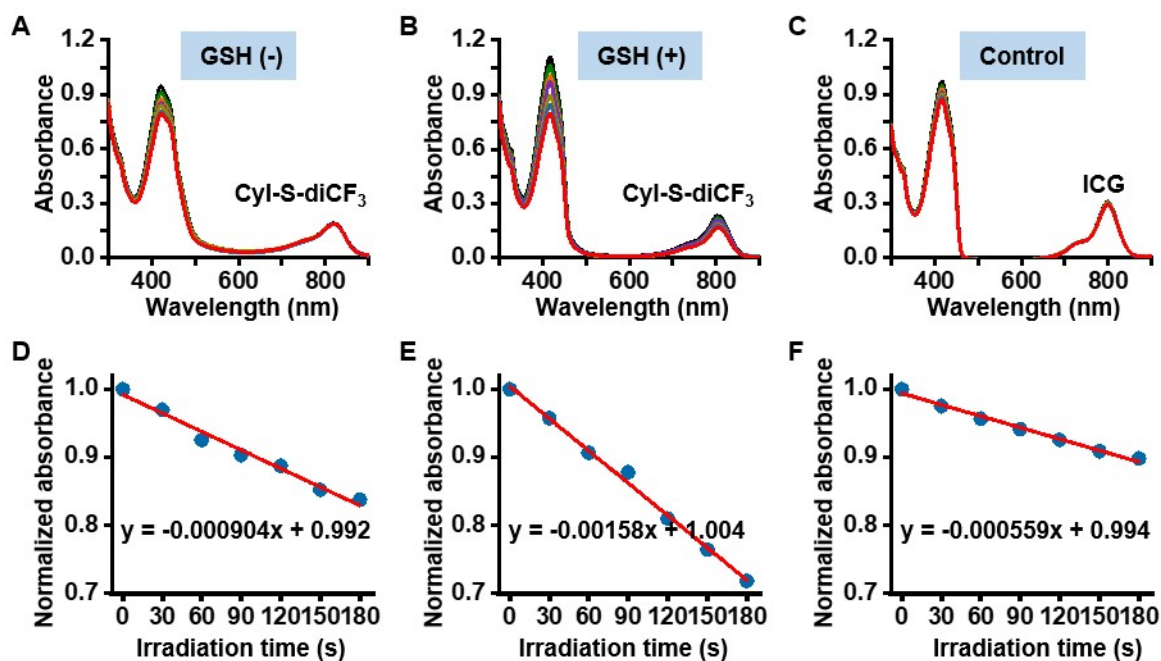
**Fig. S2** The linear plot of fluorescence intensity of CyI-S-diCF<sub>3</sub> (10  $\mu$ M) in the presence of various concentrations of GSH (0-100  $\mu$ M).



**Fig. S3** Time-dependent NIR fluorescence spectra of CyI-S-diCF<sub>3</sub> (10  $\mu$ M) in PBS (10 mM, pH 7.4, 30% DMSO) after incubation with GSH (100  $\mu$ M) at 37  $^{\circ}$ C for varied time.



**Fig. S4** The corresponding plot of fluorescence intensity of CyI-S-diCF<sub>3</sub> after treated with GSH (100  $\mu$ M) at 37  $^{\circ}$ C within 50 min.



**Fig. S5** The singlet oxygen quantum yield calculation. DPBF absorbance change at 418 nm induced by (A) CyI-S-diCF<sub>3</sub> without GSH, (B) CyI-S-diCF<sub>3</sub> treated with GSH (100  $\mu$ M), and (C) ICG after 808 nm

irradiation. (D-F) The corresponding linear calibration curve for the absorbance of DPBF to illumination time.

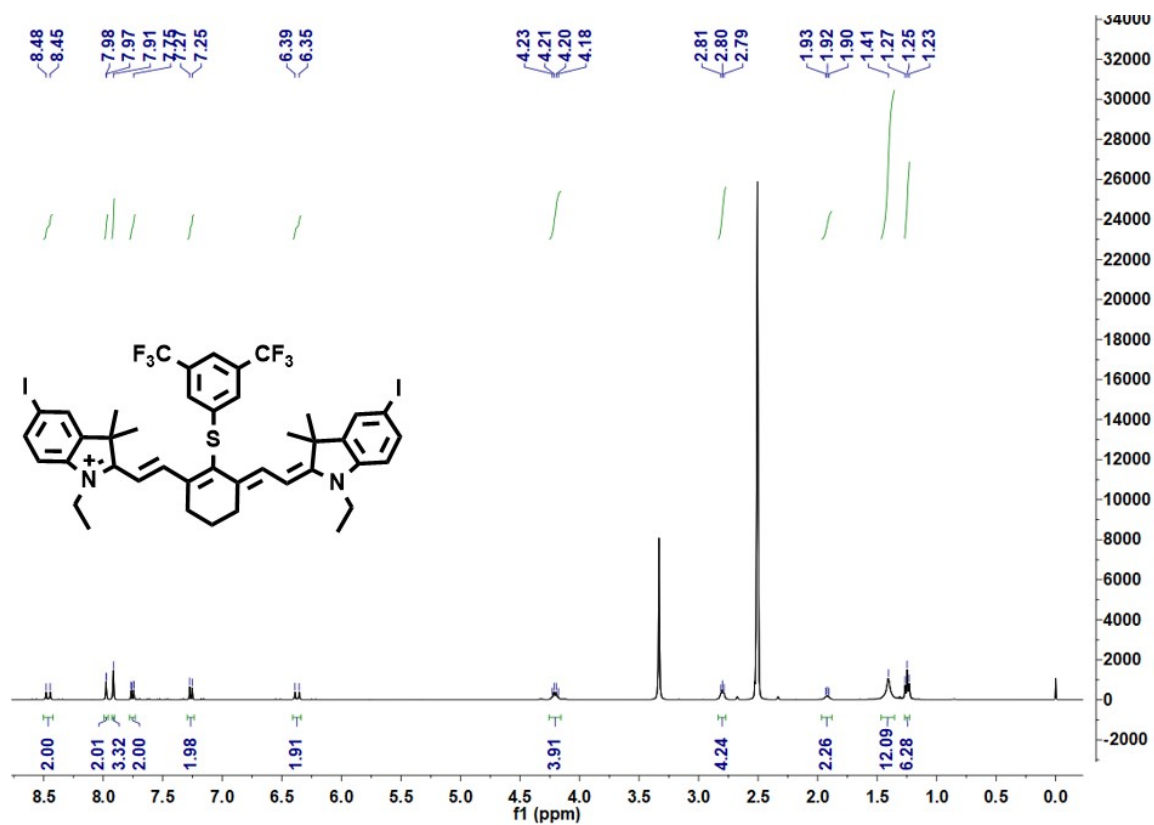


Fig. S6 <sup>1</sup>H NMR spectra of CyI-S-diCF<sub>3</sub>.

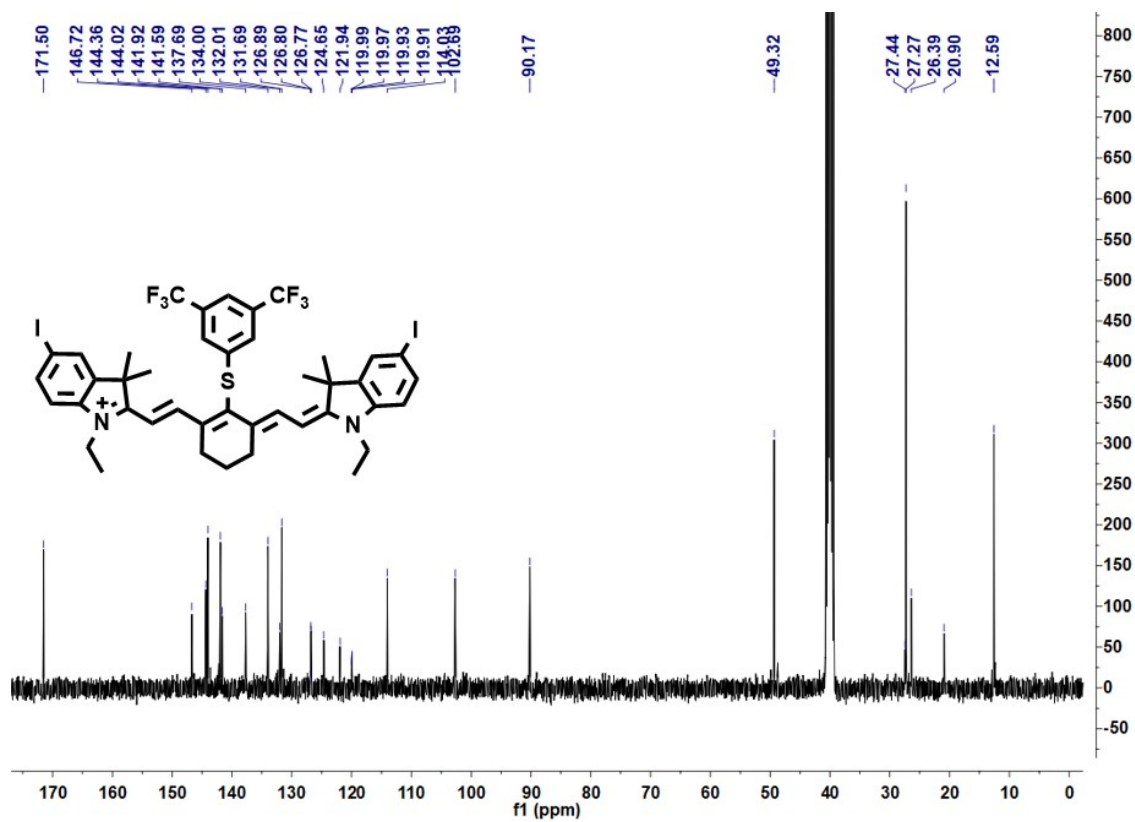


Fig. S7 <sup>13</sup>C NMR spectra of CyI-S-diCF<sub>3</sub>.

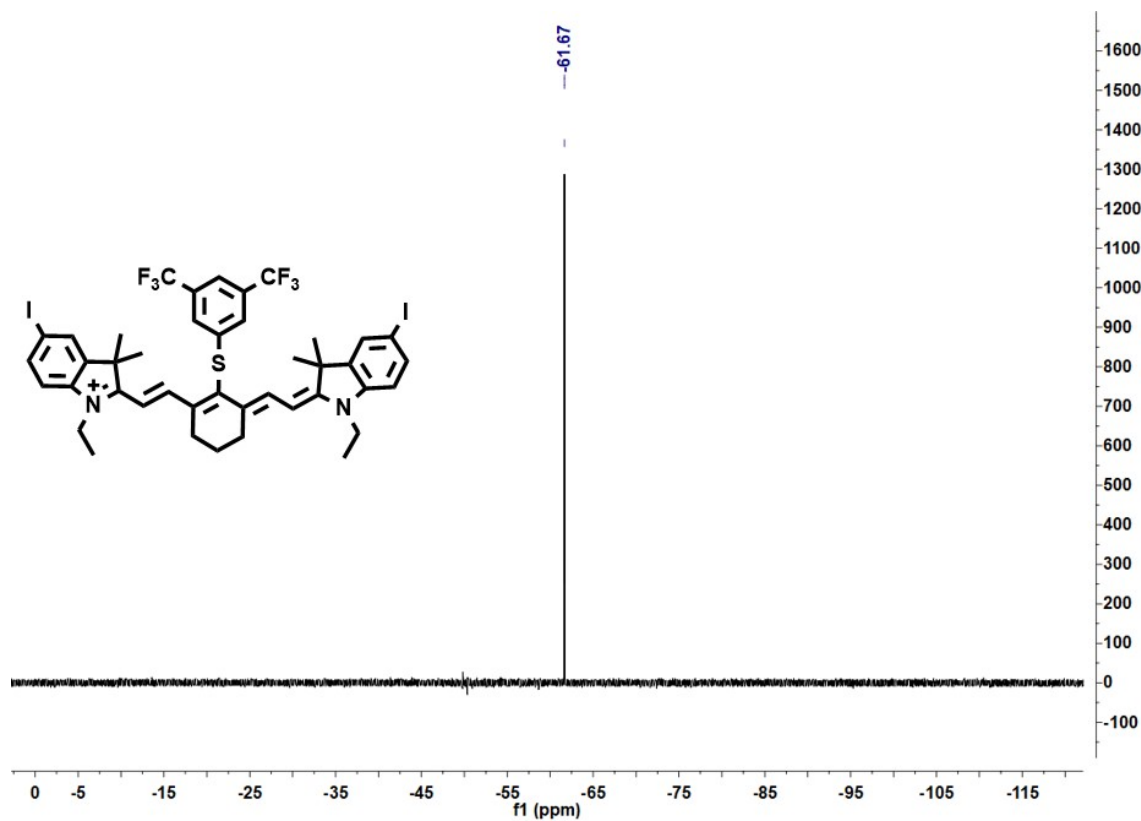


Fig. S8 <sup>19</sup>F NMR spectra of CyI-S-diCF<sub>3</sub>.

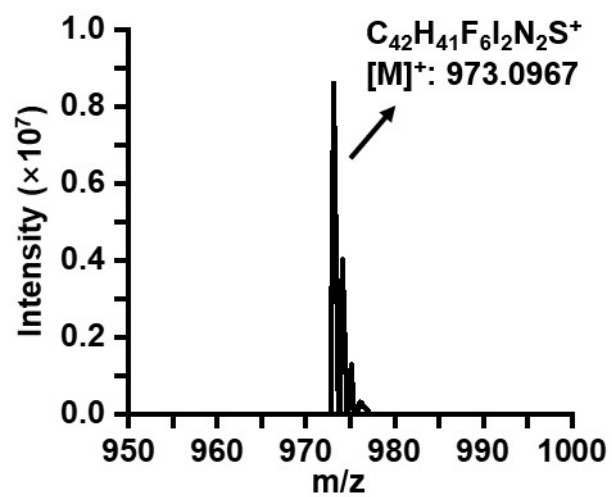


Fig. S9 ESI-HRMS spectrum of Cyl-S-diCF<sub>3</sub>.