Supporting information

A novel near-infrared fluorescent hydrogen sulfide probe for live cells and tissues imaging

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1. The characterization of the REDCP and NIR-NP

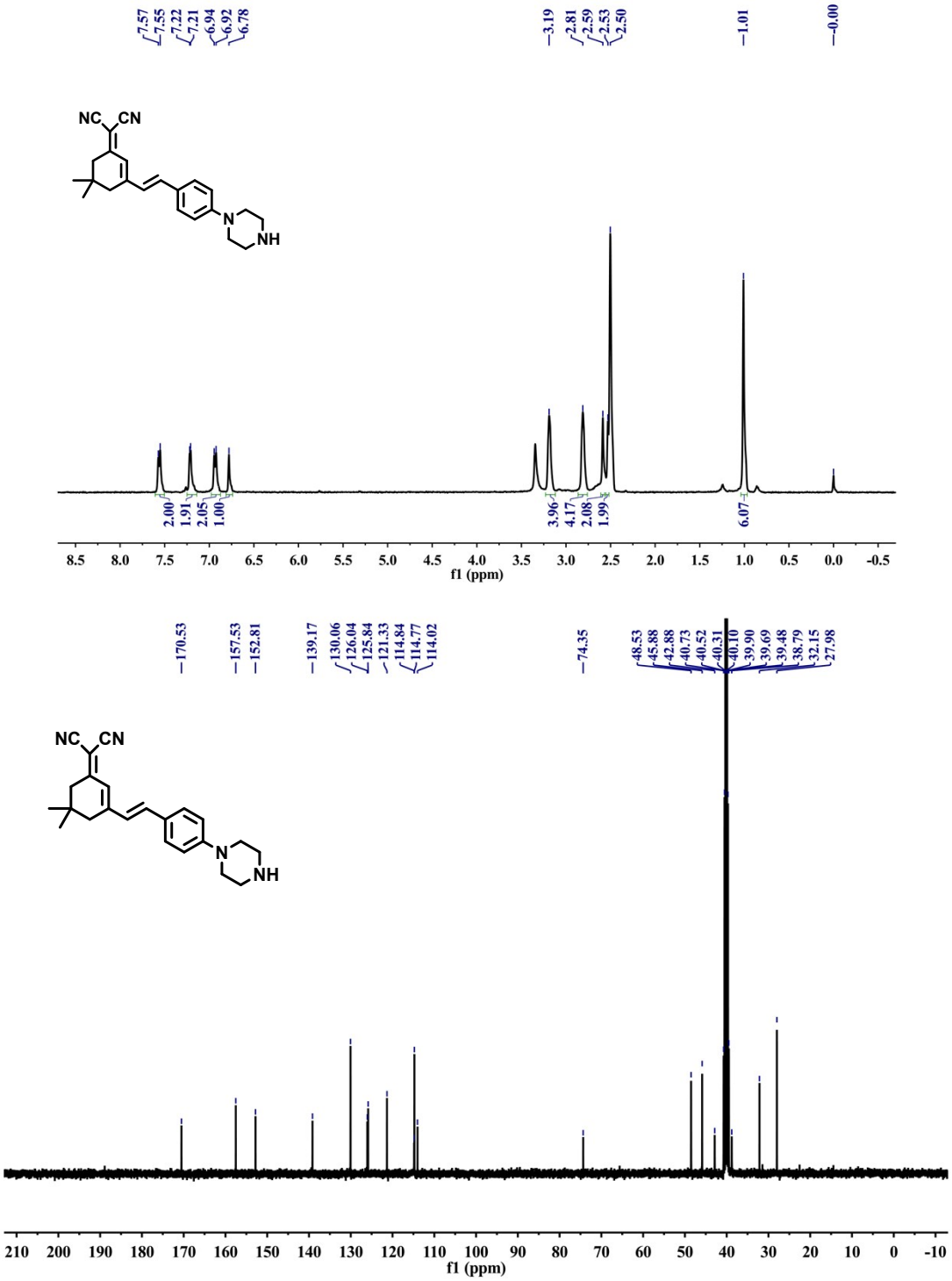


Fig.S1. ^{1}H NMR and ^{13}C NMR spectrum of REDCP (DMSO-D_6, 400 MHZ)

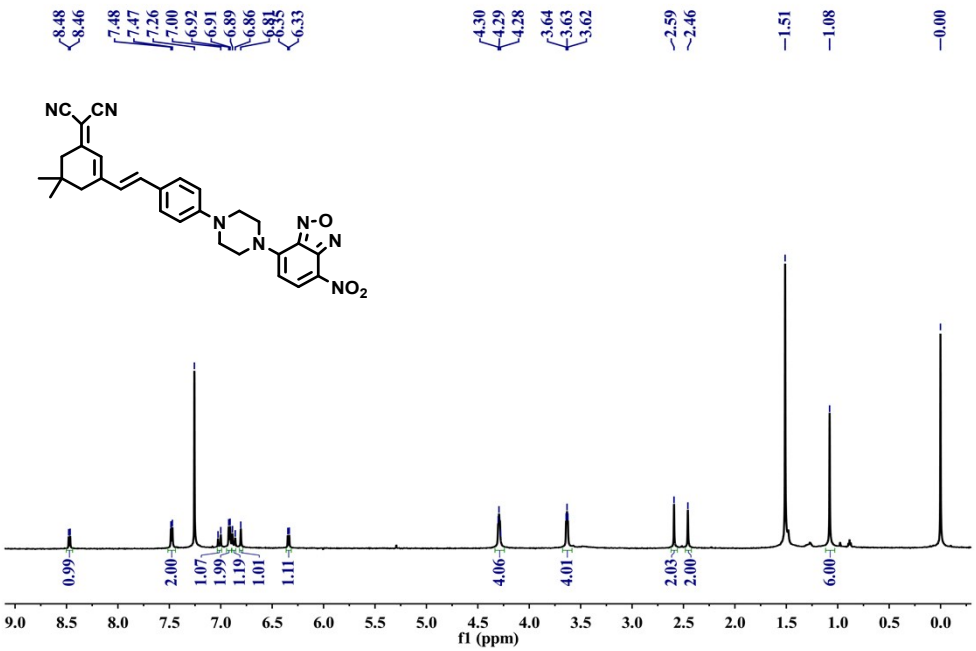


Fig.S2. ^{1}H NMR spectrum of **NIR-NP** (CDCl3-D_6, 600 MHZ)

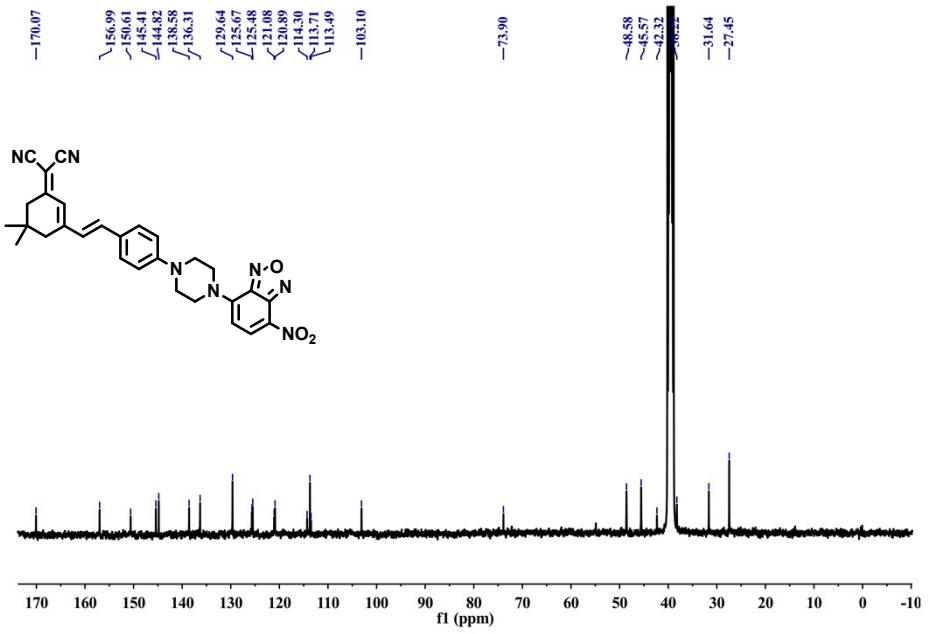


Fig.S3. ^{13}C NMR spectrum of **NIR-NP** (DMSO-D_6, 400 MHZ)

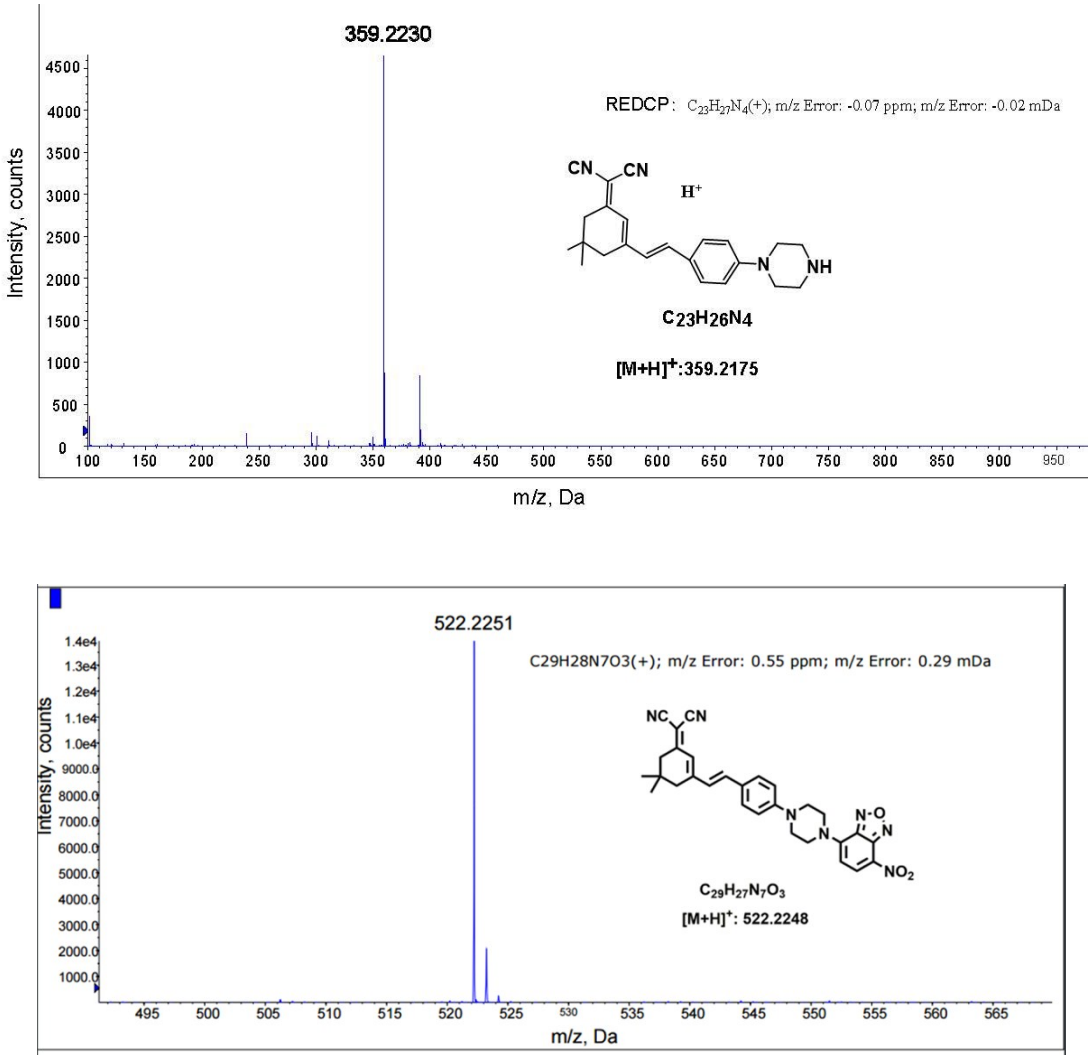


Fig.S4. HRMS of REDCP m/z Calcd. .for C23H26N4: 359.2175[M+H] +, found: 359.2230 and NIR-NP m/z Calcd. .for C29H28N7O3+: 522.2248[M+H] +, found: 522.2251.

2. The UV and fluorescence properties of the NIR-NP probe

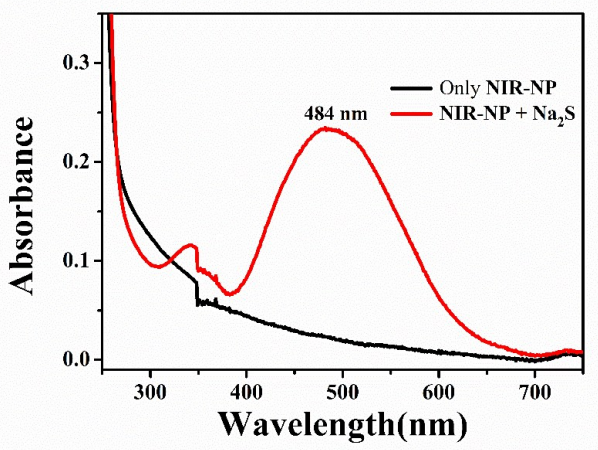


Fig.S5. The change of ultraviolet visible light absorption NIR-NP (10 μM) was analyzed in the absence (black) and presence (red) of 100 μM Na_2S.

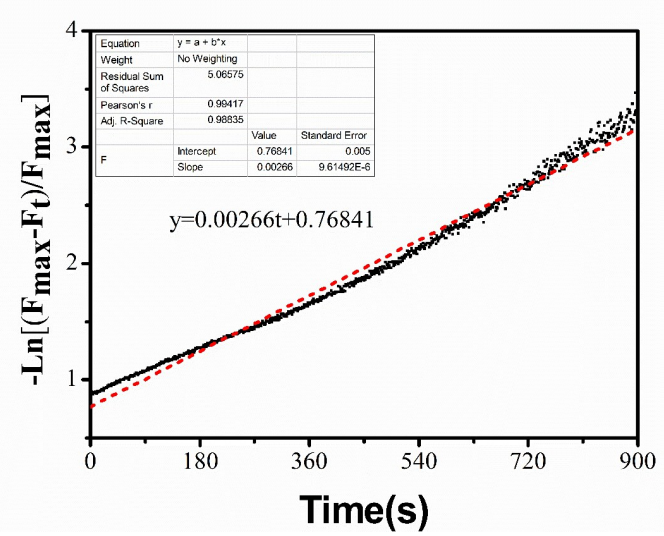


Fig. S6. Pseudo first-order kinetic plot of the reaction of NIR-NP (10 μM) with Na_2S (100 μM), slope = 0.00266×10^{-3}, so k' = 2.7×10^{-3} s^{-1}.

3. The probe properties was analyzed in biological systems

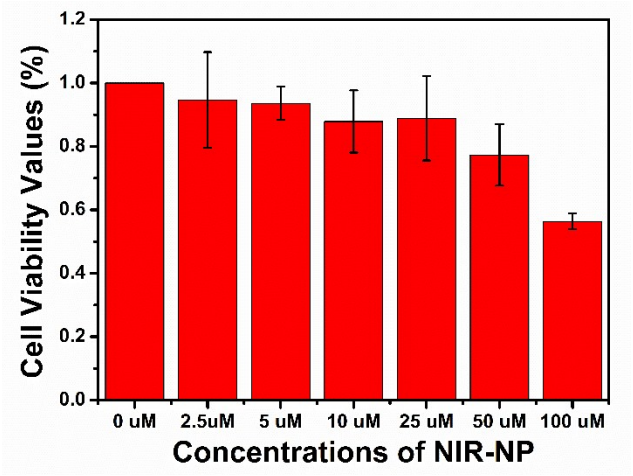


Fig.S7. Cell viability of HeLa cells after 24 hours by CCK-8 assay, and the experiment was repeated three times and the date are shown as mean (±SD).

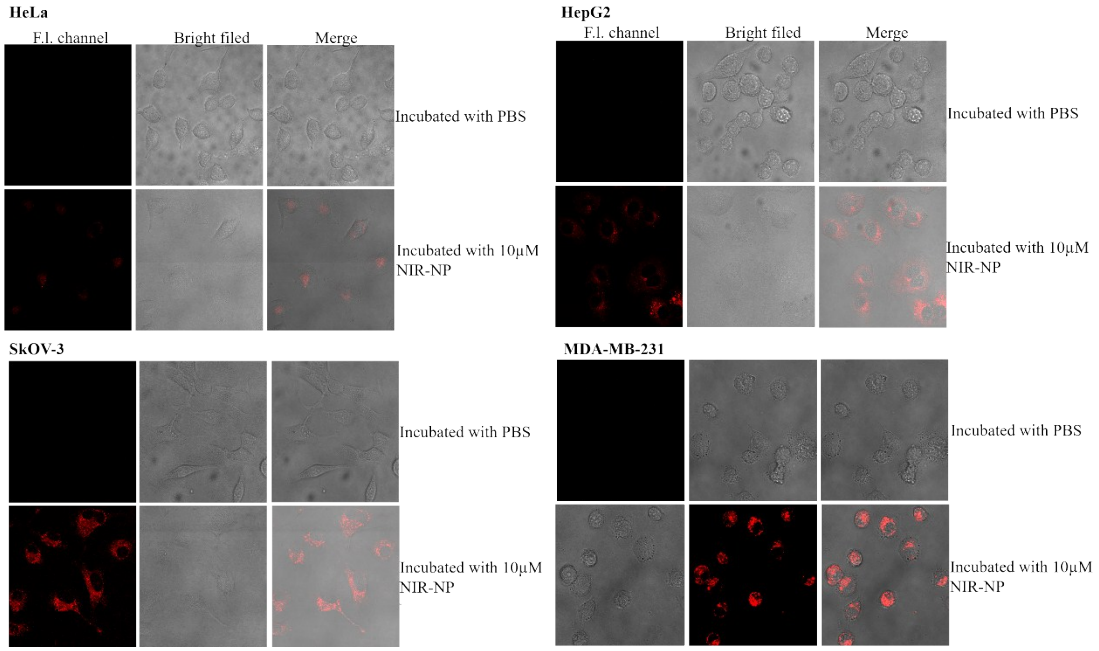


Fig.S8. The confocal imaging of different tumor cells. The cells was incubated with PBS as control (above) and incubation with 10 μM probe **NIR-NP** for 30min (below). Confocal images was performed by confocal microscopy: λex: 440 nm / λem: 600-700 nm.

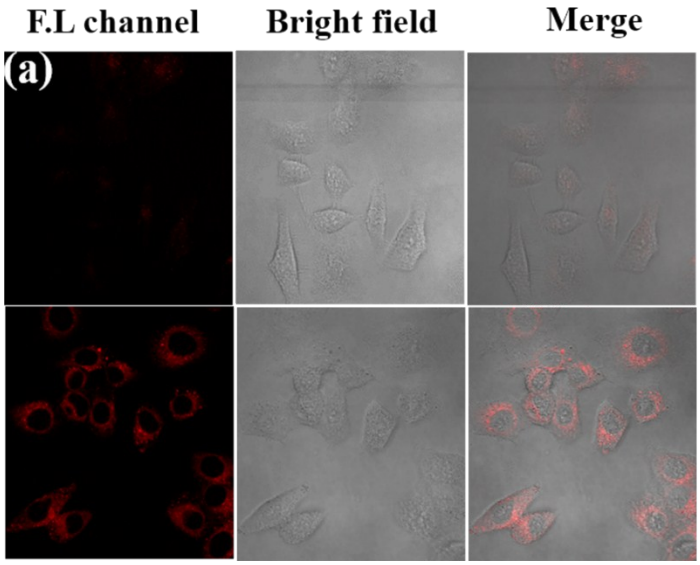


Fig.S9. **(a)** HepG2 cells were pre-treated with 1mM PAG for 1 h and then incubated with 10 μM **NIR-NP**; **(b)** pre-treated with 1 mM PAG for 1 h and incubated 10 μM **NIR-NP**, then incubated with 100 μM Na_2S for 30 min; confocal image was performed by confocal microscopy: λex: 440 nm / λem: 600-700 nm.

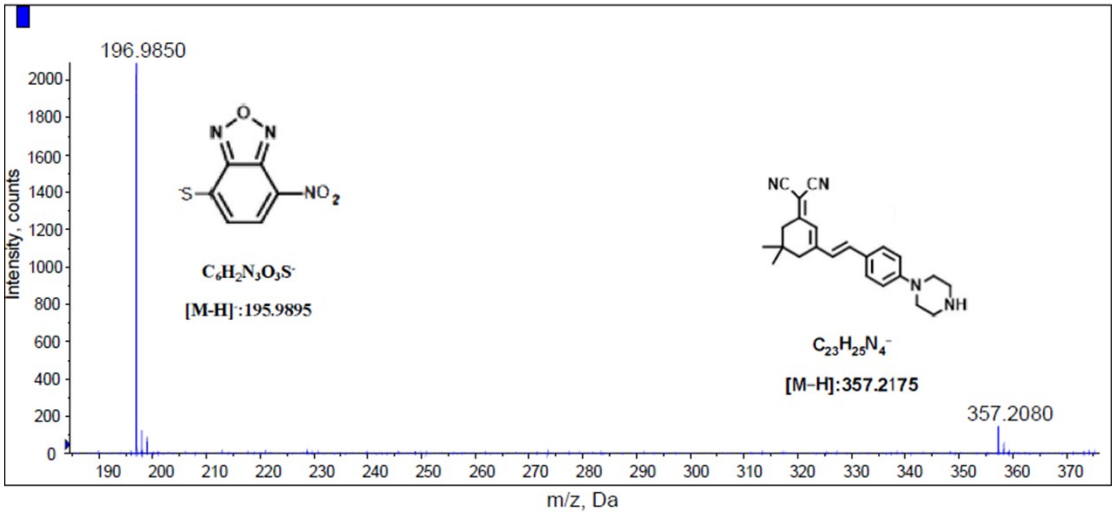
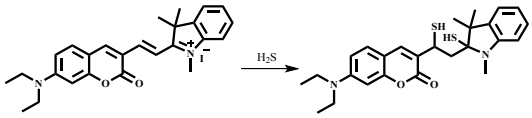
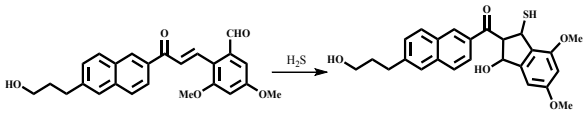
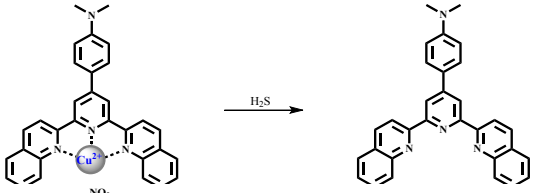
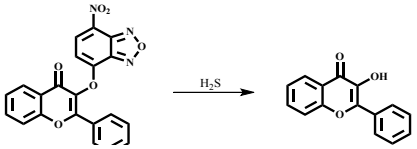
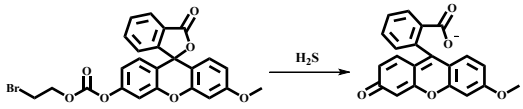
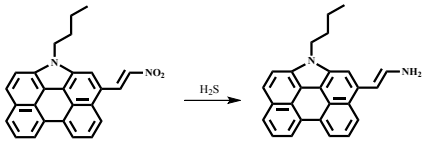
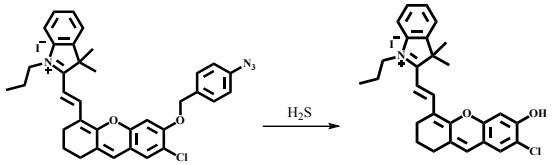
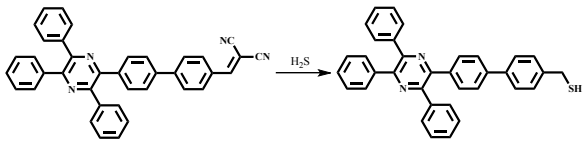
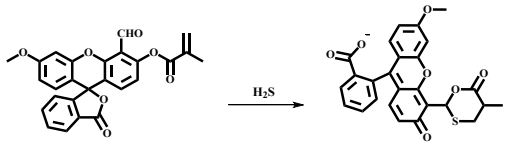
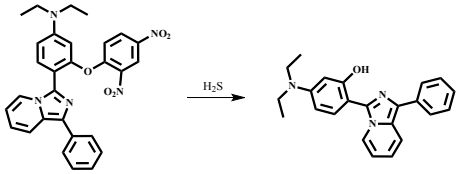
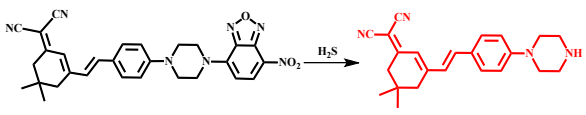


Fig.S10. HRMS spectra for analyzing the reaction mechanism of **NIR-NP** and Na_2S, and the REDCP-H whose m/z Calcd.for $C_{23}H_{25}N_{4-}$: 357.2175 [M-H], found: 357.2080 and NBD-SH, m/z Calcd.for $C_6H_2O_3S^-$. 195.9895 [M-H], found 195.9850 with negative mode.

Table S1 Comparison of **NIR-NP** with recently reported probes for detection of H_2S

Recognition process	LOD	Stokes Shift	Fluorescence signal	Ref.
	0.014 μM	no data	Turn-Off	1
	0.050 μM	135 nm	Turn-On	2
	2.240 μM	146 nm	Turn-On	3
	0.020 μM	170 nm	Turn-On	4
	0.130 μM	47 nm	Turn-On	5
	0.139 μM	73 nm	Blue-Shift	6
	0.260 μM	40 nm	Turn-On	7
	0.500 μM	57 nm	Blue-Shift	8
	0.037 μM	22 nm	Turn-On	9
	0.360 μM	193 nm	Turn-On	10
	0.030 μM	186 nm	Turn-On	This work

Reference

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