Near-infrared and lysosome-targetable fluorescent probe based on phenoxazinium for detection of hydrogen peroxide

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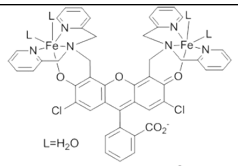
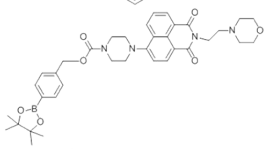
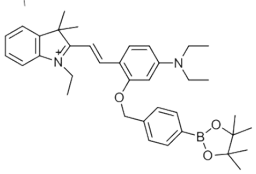
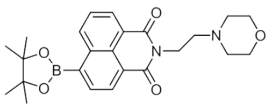
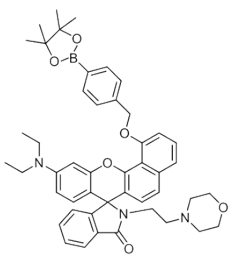
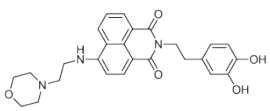
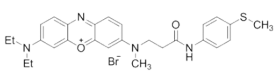
Table. S1 Properties of the reported lysosome targeted probes for H_2O_2.

Probes	Signaling mode	$\lambda_{Em,max}$ [a]	LOD[b]	Response time	Working solution	references
	Turn-on	536	29 μM	10 min	PIPES (pH 7.0)	*Chem. Commun.* 2012, 48, 5449
	Turn-on	528	----	30 min	PBS / DMF (99:1, pH 7.4)	*Sci Rep.* 2015, 5, 8488
	Turn-on	584	0.23 μM	10 min	Acetate buffer (pH 5.0)	*Anal. Chem.* 2016, 88, 5865
	Turn-on ((two photon)	550	1.21 μM	160 s	PBS / DMF (1:1, pH 7.4)	*Biosens Bioelectron.* 2016, 79, 237
	Turn-on	606	0.06 μM	9 min	Acetate buffer (pH 4.5)	*Analyst.* 2017, 142, 4522
	Turn-on	537	0.22 μM	60 min	PBS / DMSO (199:1, pH 7.4)	*Chem. Commun.* 2017, 53, 3701
	Turn-on	676	0.21 μM	25 min	PBS / DMSO (9:1, pH 7.4)	*This work*

[a] Reported in nm. [b] The reported limit of detection (LOD) of the corresponding probes.

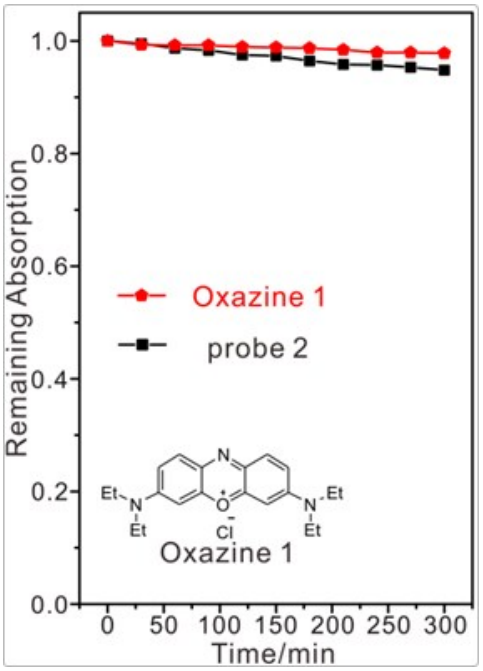


Fig. S1 Photofading behaviors of probe **2** and Oxazine 1 in acetonitrile.

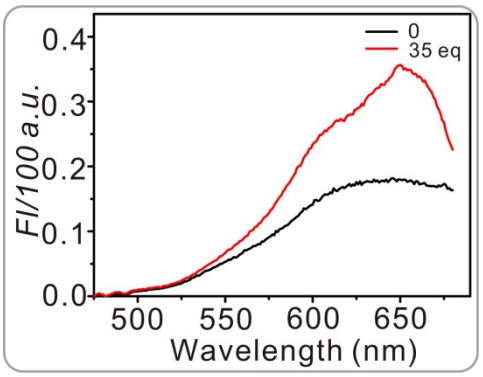


Fig. S2 Excitation spectra of probe **2** (10 μM, λ_{em} = 675 nm, slit width: 3 nm/1.5 nm) towards the H_2O_2 in PBS buffer (20 mM, pH=7.4) containing 10% DMSO.

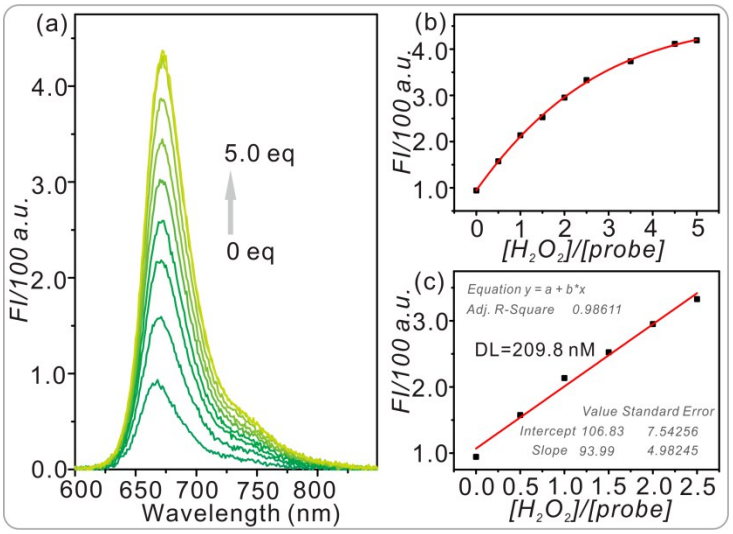


Fig. S3 Detection limit test of probe **2** (1 μM) toward different H_2O_2 concentration in PBS buffer (20 mM, pH=7.4). (a) Emission spectra (λ_{ex} = 590 nm, slit width: 5 nm/3 nm). (b) Plot of the fluorescence intensity upon addition of H_2O_2 (0–2.5 μM).

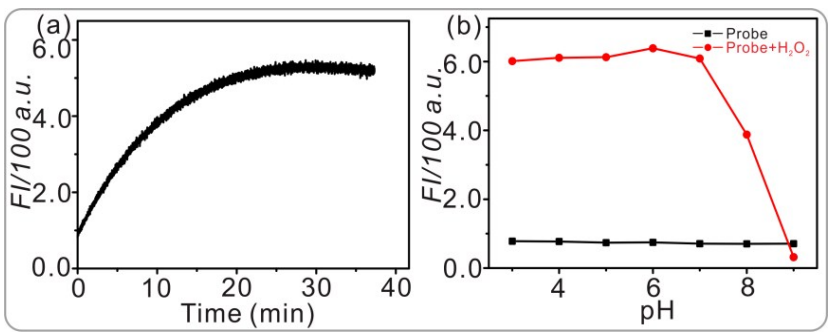


Fig. S4 The time course response and pH-dependent of the probe **2** (10 μM) to H_2O_2 (35.0 equiv.) in PBS buffer (20 mM, pH=7.4). (a) Time course response. (b) The pH-dependent response for free probe and probe + H_2O_2; All data represent the fluorescence intensity at 676 nm (λ_{ex} = 590 nm, slit: 3/3 nm).

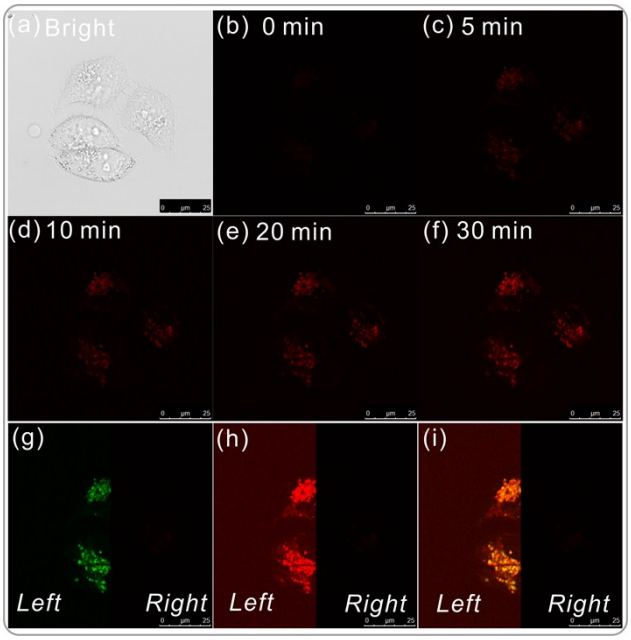


Fig. S5 Fluorescence confocal images of HeLa cancer cells with probe **2** (10 μM) and LysoTracker Green DND-26 (50 nM). (a) Bright-field transmission image; (b) Confocal image (red channel) with probe **2** before treatment of H_2O_2; (c–f) confocal images of cells with probe **2** after treatment of H_2O_2 (10 mM) for 5 min, 10 min, 20 min, 30 min; (g) left, confocal images (green channel) of cells with LysoTracker Green DND-26; right, the right half of (b); (h) left, enhanced background light of (b); right, the right half of (b); (i) merged images of (g) and (h).

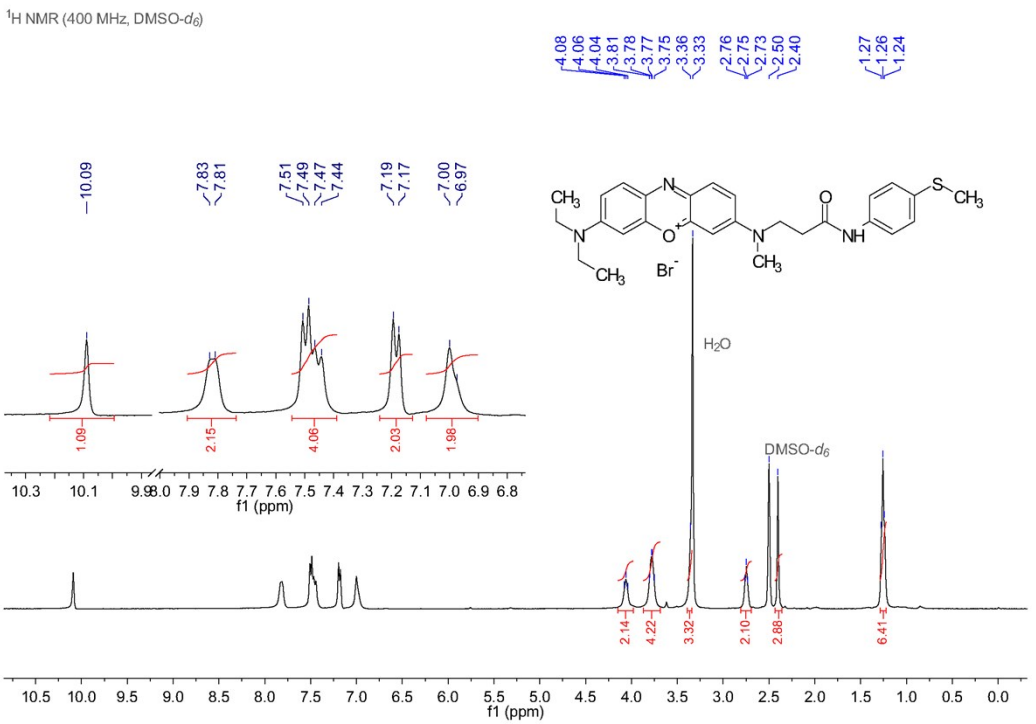


Fig. S6 ^{1}H-NMR spectrum of compound **2**.

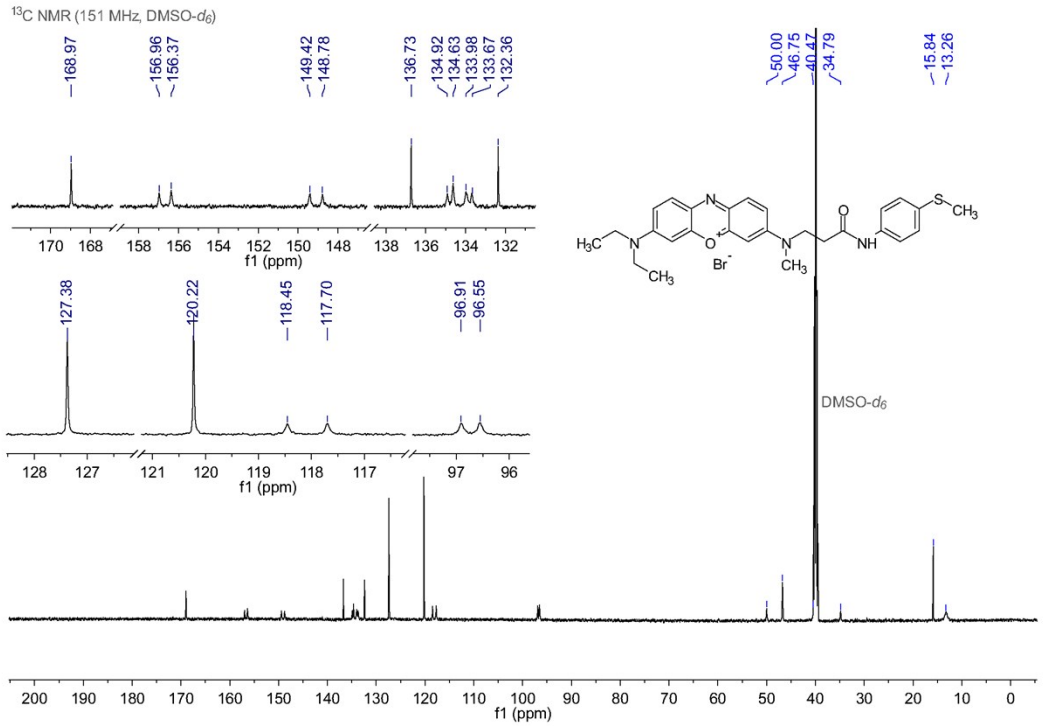


Fig. S7 ^{13}C-NMR spectrum of compound **2**.

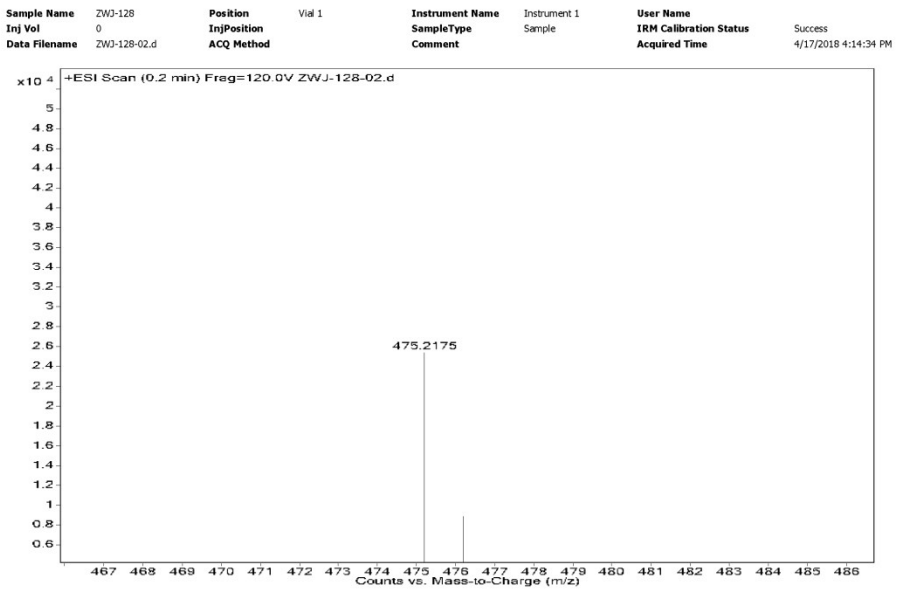


Fig. S8 HRMS(ESI$^+$) spectrum of compound **2**.

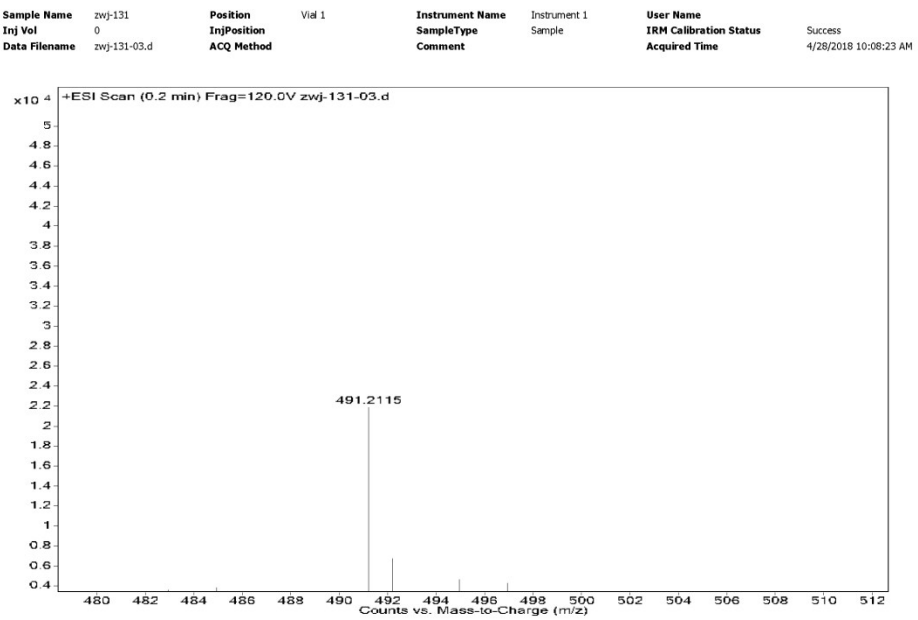


Fig. S9 Mass spectrum of **2** + H_2O_2 adduct.