Electronic Supplementary Material (ESI) for New Journal of Chemistry.

A highly sensitive fluorescent probe for selective detection of cyste-ine/homocysteine from glutathione and its application in living cells and tissues

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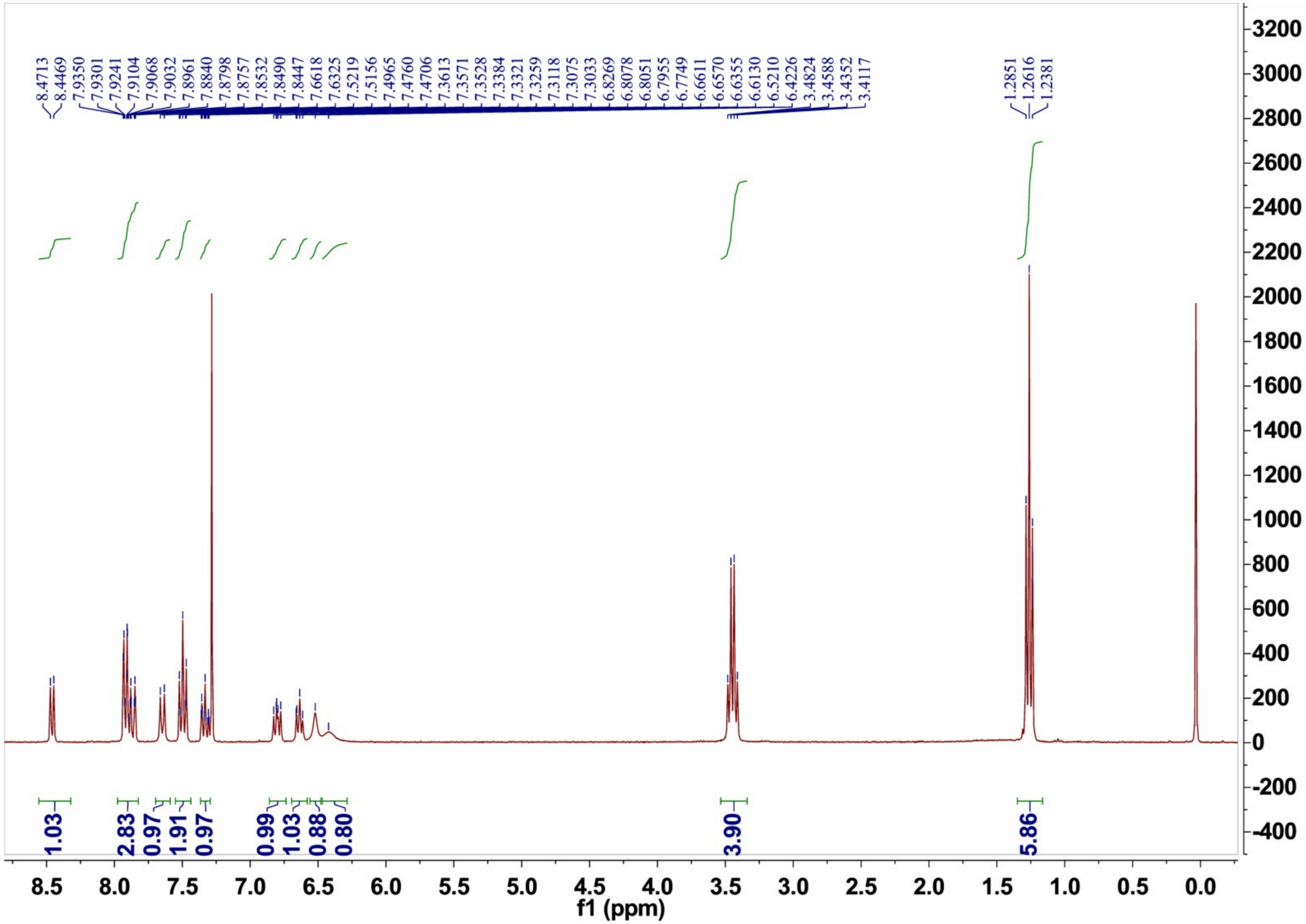


Fig. S1 ^{1}H-NMR of **NIPY-OH**

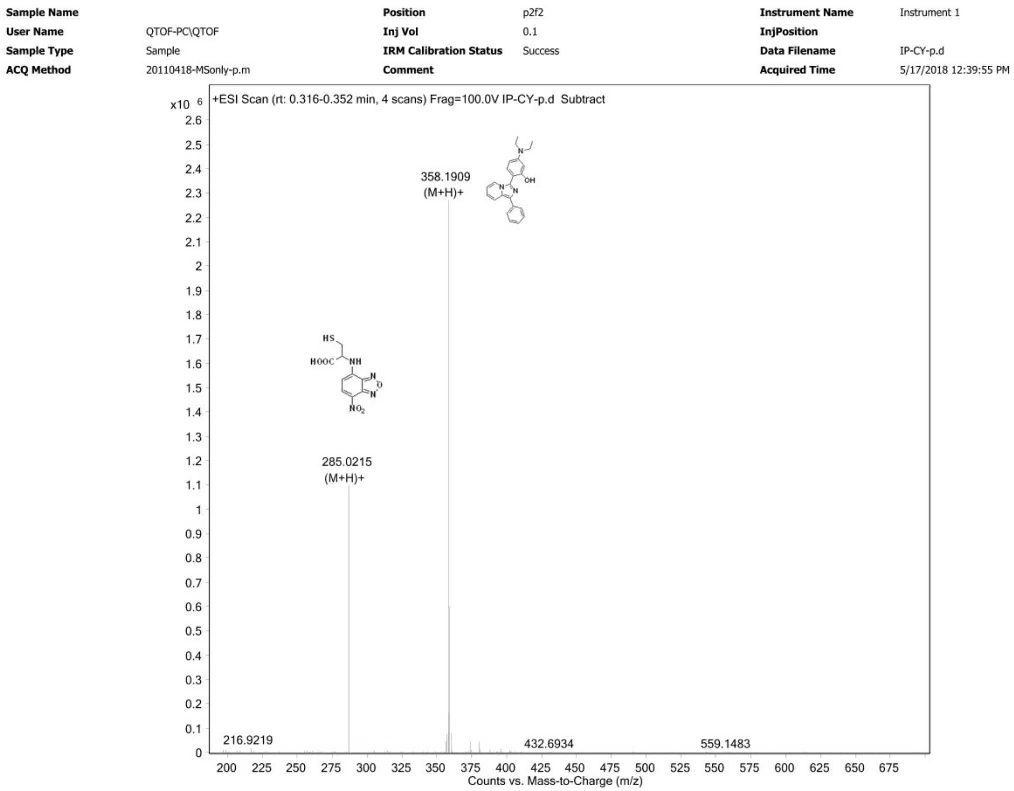


Fig. S2 HRMS spectrum of reaction products of the probe **NIPY-NBD** with Cys.

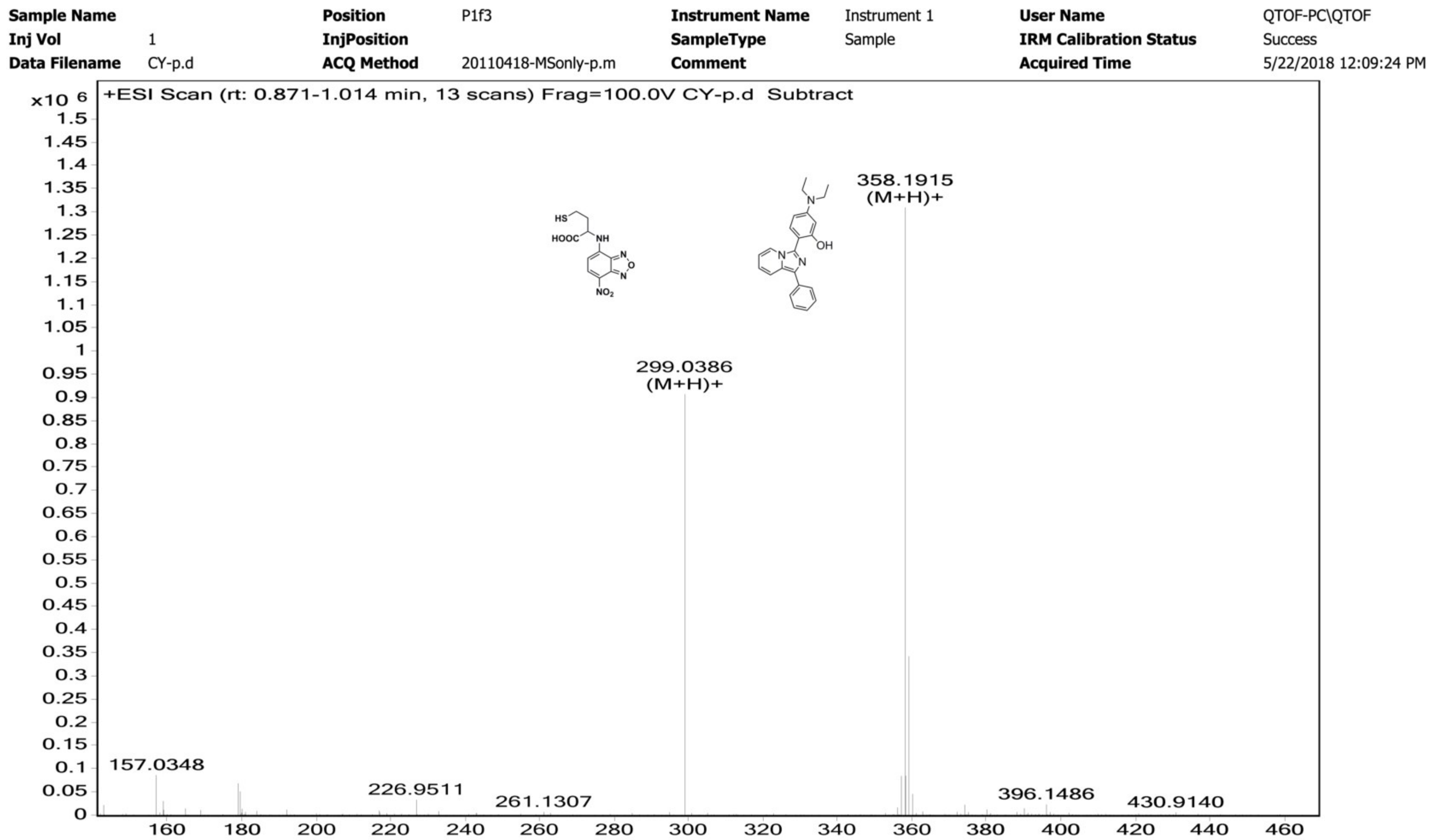


Fig. S3 HRMS spectrum of reaction products of the probe **NIPY-NBD** with Hcy.

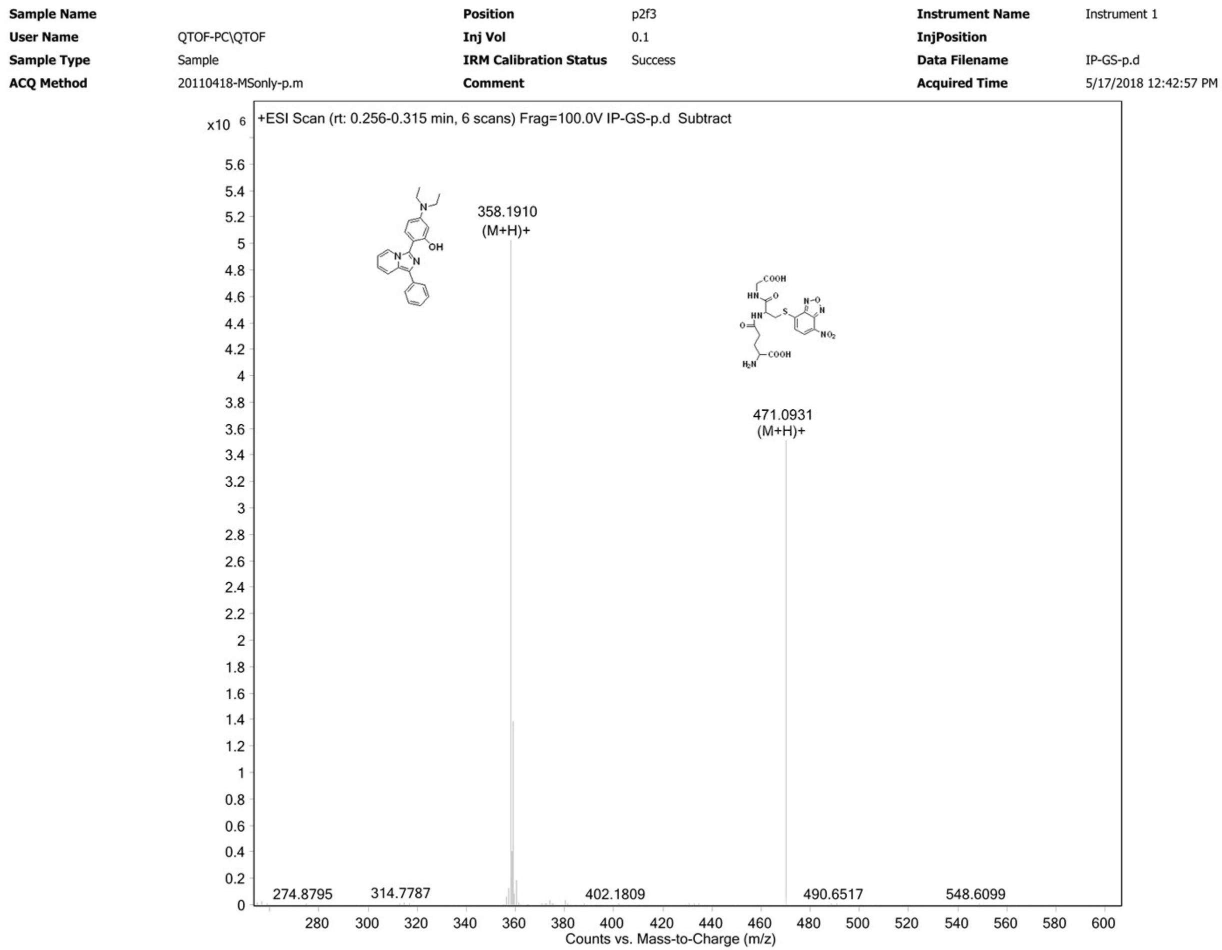
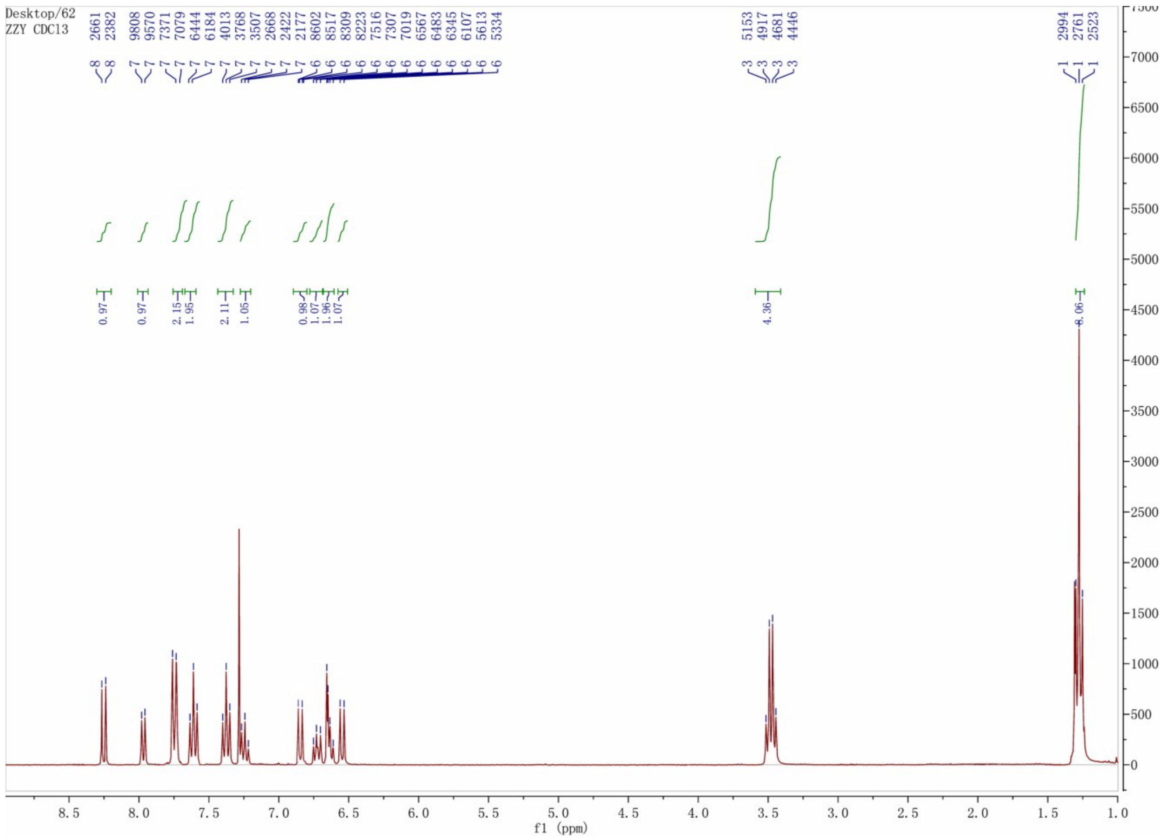


Fig. S4 HRMS spectrum of reaction products of the probe **NIPY-NBD** with GSH.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f1 (ppm)

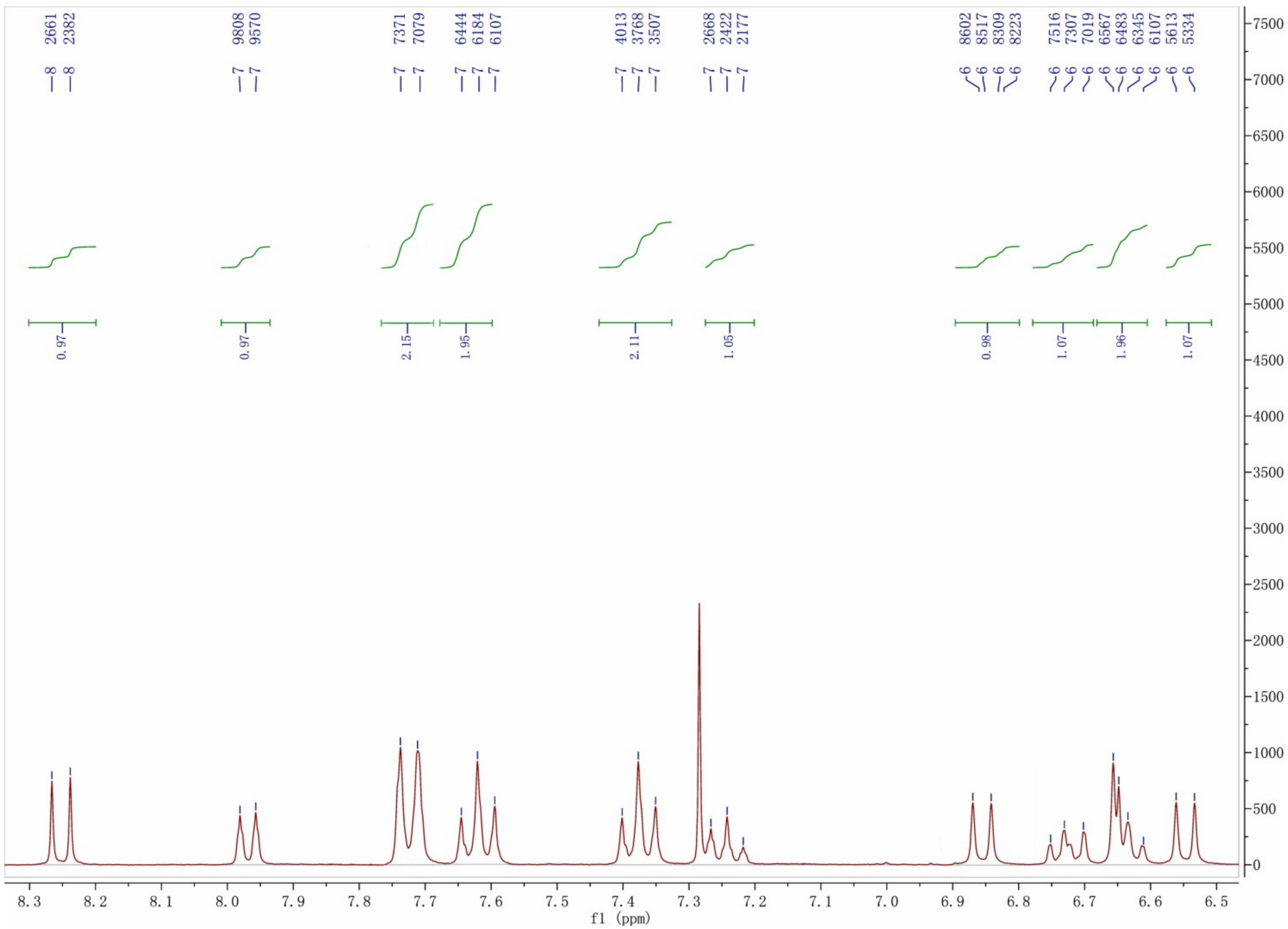


Fig. S5 ^{1}H-NMR of the probe **NIPY-NBD**.

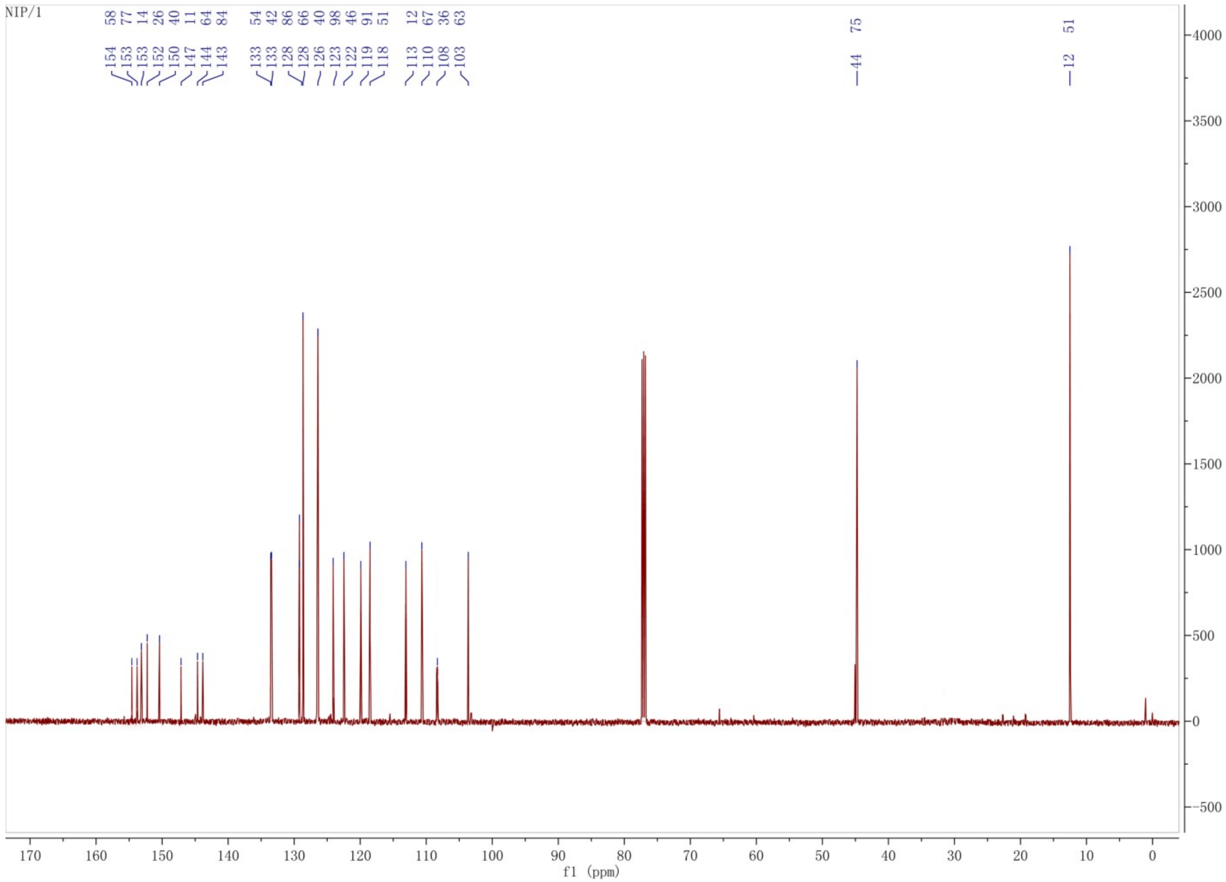


Fig. S6 ^{13}C-NMR of the probe **NIPY-NBD**.

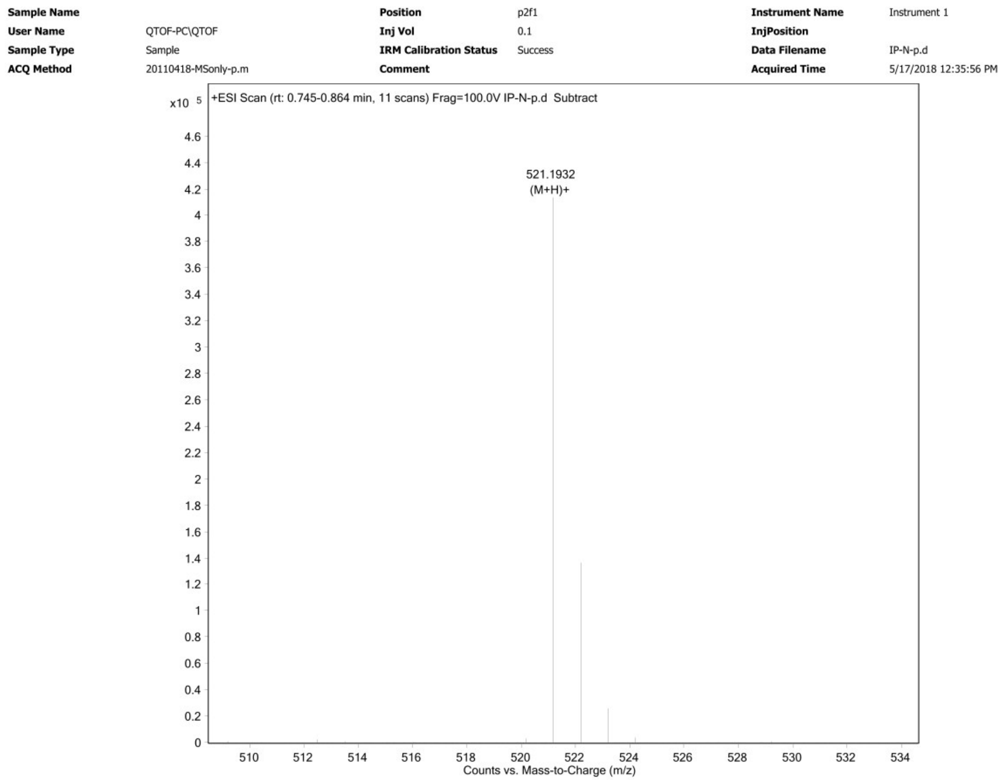


Fig. S7 HRMS spectrum of the probe **NIPY-NBD**.

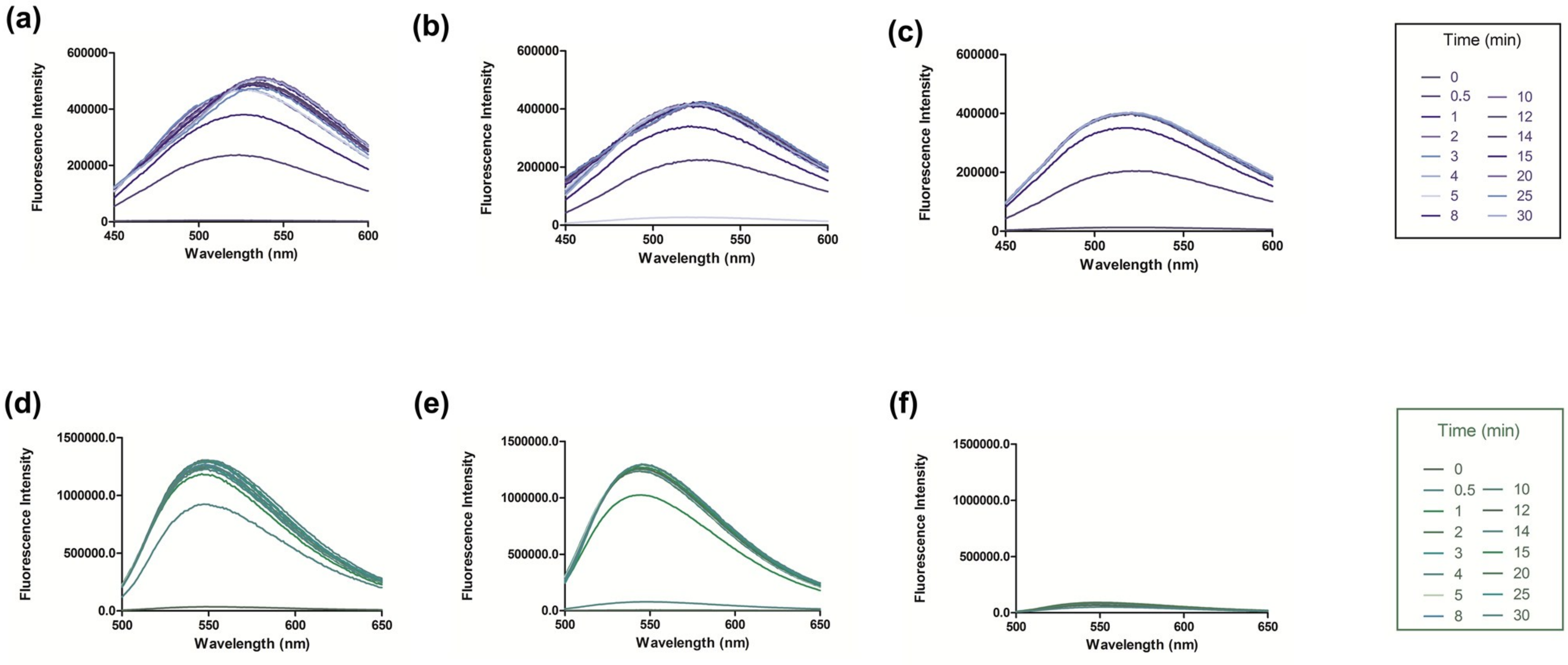
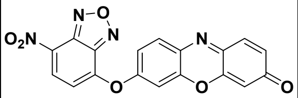
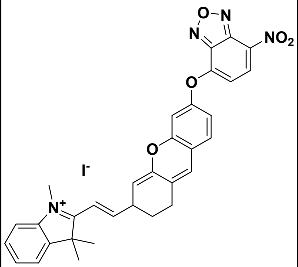
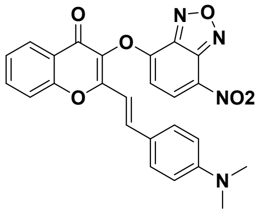
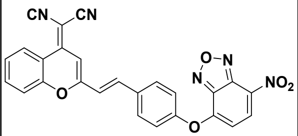
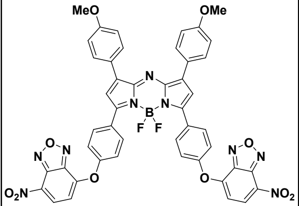
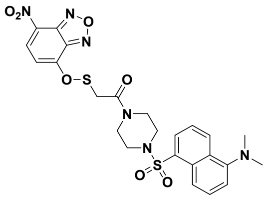


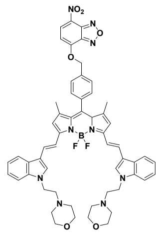
Fig. S8 The response time fluorescence map of the probe **NIPY-NBD** (10 μM) with time after adding 20 μM Cys/Hcy and GSH in PBS-DMSO buffer (v/v = 1/1). (a,d: adding Cys, b,e: adding Hcy, c,f: adding GSH, a-c: $\lambda_{ex/em}$ = 310 / 520 nm, d-f: $\lambda_{ex/em}$ = 470 / 550 nm).

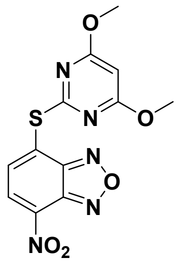
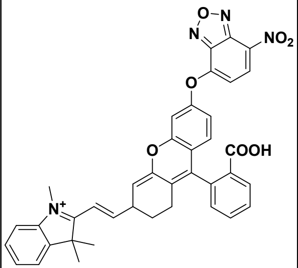
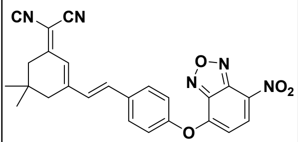
Table. S1 Comparison of fluorescent probes for Cys/Hcy from GSH with NBD group.

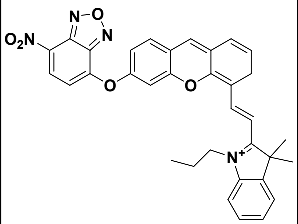
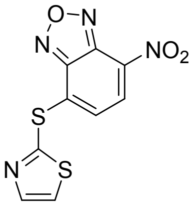
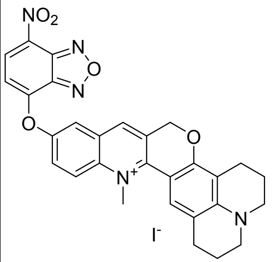
Probes	Fluorescence enhancement (at the concentration of Cys)	Response time/Limit of detection	Spectral separation Probe between two emissions/Stokes Shift	Reference
 *Chem. Commun*, **2015**	81 fold (I403/I519) at 320 μM	10 min; For Cys and GSH - 130 and 70 nM, respectively	λ_{ex1}=470 nm ; λ_{em1}=540 nm λ_{ex2}=470 nm ; λ_{em2}=585 nm 70 & 115 nm	1
 *Biosens. Bioelectron* , **2016**	100 fold at 100 μM	5 min /20 min; For Cys, Hcy and GSH - 27, 25 and 16 nM, respectively	λ_{ex1}=470 nm ; λ_{em1}=550 nm λ_{ex2}=670 nm ; λ_{em2}=716 nm 80 & 46 nm	2

 *Anal. Chem,* **2016**	70 fold at 30 μM	120 min For Cys, Hcy and GSH- 2100, 2700 and 6400 nM, respectively	λ_{ex1}=650 nm; λ_{em1}=705 nm; λ_{ex2}=476 nm; λ_{em2}=545 nm; 55 & 79 nm	3

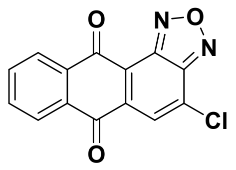
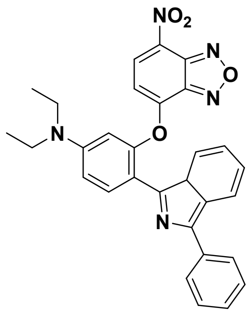
 *Sens. Actuators B-Chem*, **2017**	54 fold at 20 μM	15 min; For Cys, Hcy and GSH - 21, 17 and 26 nM, respectively	λ_{ex1}=475 nm; λ_{em1}=560 nm λ_{ex2}=560 nm; λ_{em2}=700 nm 85 & 140 nm	4
 *Chem. Commun.* **2017**	30 fold at 10 mM	10 min; For Cys, Hcy and GSH - 80, 170 and 50 nM, respectively	λ_{ex1}=470 nm; λ_{em1}=540 nm; λ_{ex2}=670 nm; λ_{em2}=730 nm 70 & 60 nm	5
 *Tetrahedron*, **2017**	118 fold at 100 μM	12 min; For Cys, Hcy – 35 and 26 nM	λ_{ex}=470 nm; λ_{em}=550 nm; 80 nm	6

 *J.Mater. Chem. B,* **2017**	*	30 min; For Cys - 22 nM	λ_{ex1}=466 nm; λ_{em1}=540 nm; λ_{ex2}=650 nm; λ_{em2}=735 nm 74 & 85 nm	7

 *Acta. A. Mol. Biomol. Spectrosc,* **2017**	78 fold at 10 μM	10 min; For Cys and Hcy - 95 and 138 nM, respectively	λ_{ex}=419 nm; λ_{em}=547 nm; 128 nm	8
 *Anal. Chim. Acta,* **2017**	9.3 fold at 10 μM	8 min; For Cys, Hcy and GSH- 21, 37 and 28 nM, respectively	λ_{ex1}=463 nm; λ_{em1}=544 nm; λ_{ex2}=650 nm; λ_{em2}=707 nm; 81 & 57 nm	9
 *Dyes Pigments*, **2017**	35 fold at 10 μM	10 min For Cys, Hcy and GSH- 51, 16 and 34 nM, respectively	λ_{ex1}=440 nm; λ_{em1}=500 nm; λ_{ex2}=400 nm; λ_{em2}=443 nm; 60 & 43 nm	10

 *Sens. Actuators B-Chem*, **2017**	50 fold at 30 μM	5 min For Cys and GSH- 68 and 81 nM	λ_{ex1}=480 nm; λ_{em1}=540 nm; λ_{ex2}=670 nm; λ_{em2}=702 nm; 60 & 32 nm	11
 *Dyes Pigments*, **2018**	103 fold at 100 μM	10 min; For Cys, Hcy - 176 and 124 nM	λ_{ex}=460 nm; λ_{em}=565 nm; 105 nm	12
	10 fold at 120 μM	15 min / 28 min; For Cys, Hcy and GSH –12, 13 and 6 nM, respectively	λ_{ex1}=502 nm; λ_{em1}=610 nm; λ_{ex2}=487 nm; λ_{em2}=547 nm 108 & 60 nm	13

Sens. Actuators B-Chem, **2018**				

 *Sens. Actuators B Chem*, **2018**	17 fold at 150 μM with only GSH	30 min; For GSH- 89 nM	λ_{ex}=465 nm; λ_{em}=558 nm; 93 nm	14
	**100 fold** (λex/em = 310 nm /520 nm) & **210 fold** (λex/em = 340 nm /550 nm) at 20 μM	**2.5 min;** **For Cys, Hcy and GSH- 21, 46 and 63 nM, respectively**	**λ_{ex1}=310 nm; λ_{em1}=520 nm;** **λ_{ex2}=470 nm; λ_{em2}=550 nm** **210 & 80 nm**	**This work**

*The data was not mentioned.

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