Supplementary Materials
Sensitive Detection of Various Forms of Hydrogen Sulfide by Highly Selective Naphthalimide-Based Fluorescent Probe

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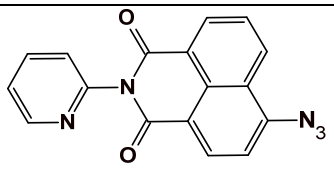
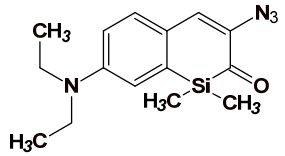
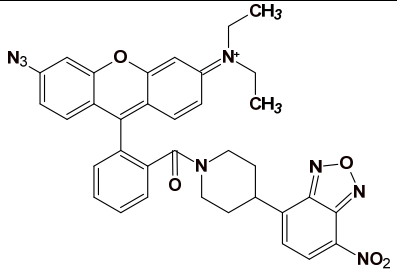
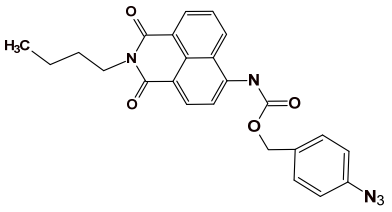
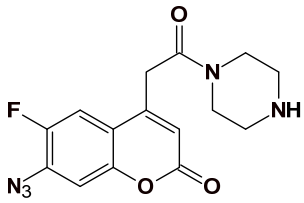
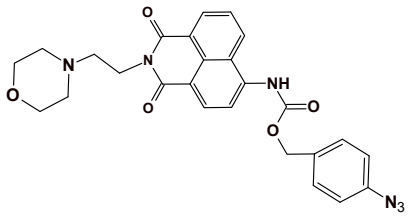
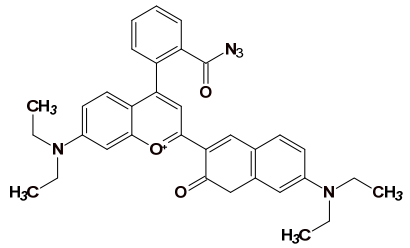
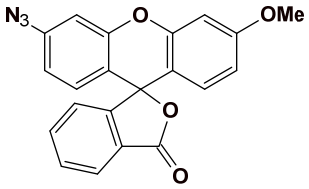
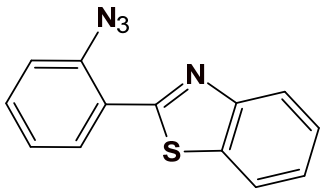
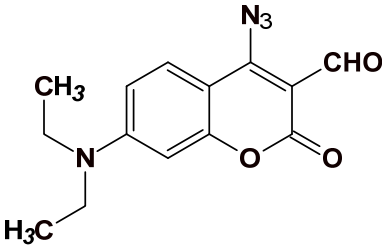
Table S1. Comparison of **NAP-Py-N$_3$** with the fluorescent probes previously reported.

Structures	Medium	ϕ_{probe}	λ_{em} (nm)	λ_{ex} (nm)	k_2 ($M^{-1}s^{-1}$)	LOD (nM)	Ref.
 **NAP-Py-N$_3$**	PB:DMSO (9:1, *v*/*v*)	0.003	553	435	9.62	15.5	Our work
 **SicAz2**	PBS:MeCN (7:3, *v*/*v*)	0.002	515	404	ND*	300	[S1]
	PBS buffer (20 mM, pH 7.4)	0.0250	565	530	1.60	120	[S2]

probe 1							
 **NAP-1**	PBS:MeCN (19:1, *v*/*v*)	0.11	541	415	5.0	110	[S3]
 **7b**	PBS:DMF (9:1, *v*/*v*)	0.012	450	350	4.16	610	[S4]
 **LR-H_2S**	PBS:MeCN (4:1, *v*/*v*)	0.12	541	410	ND*	700	[S5]
 **1**	H_2O:acetone (7:3, *v*/*v*)	0.56	478	410	ND*	220	[S6]
	50 mM PIPES buffer, 100 mM KCl, pH 7.4	<0.01	516	476	ND*	86	[S7]

MeRho-Az							
 **1**	PBS buffer (10 mM, pH 7.4, 1 mM CTAB)	0.0064	450	375	ND*	0.78	[S8]
 **CA**	MeCN:H_2O (3:7, *v*/*v*)	422		360	ND*	3.5	[S9}

*ND-no determined

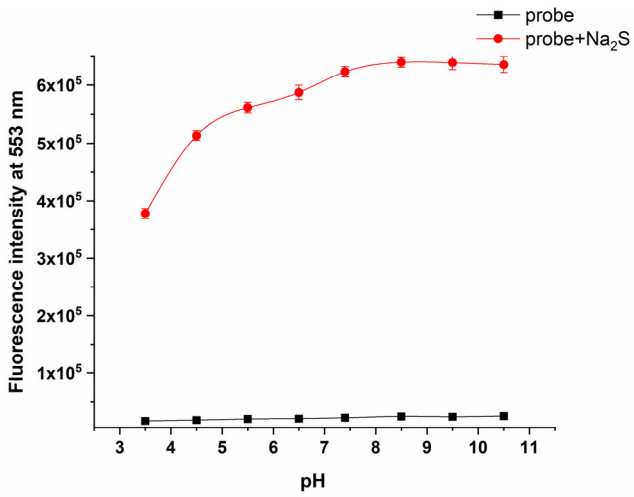


Figure S1. The fluorescence intensity of **NAP-Py-N$_3$** (7.5 μM) in the absence and presence of Na_2S (37.5μM) in different pH buffer solutions (excitation is 435 nm, slites 1.5/1.5 nm). Data are shown as mean ± standard deviation of three independent experiments.

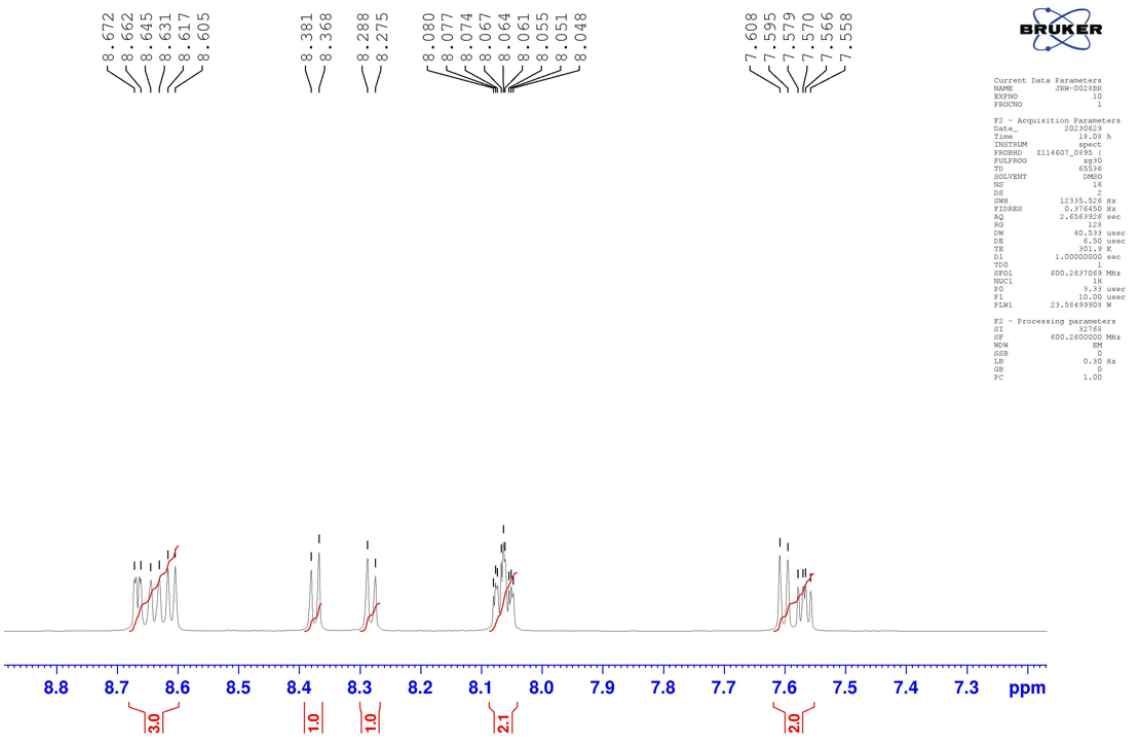


Figure S2. [1]H-NMR spectra of **NAP-Py-Br**

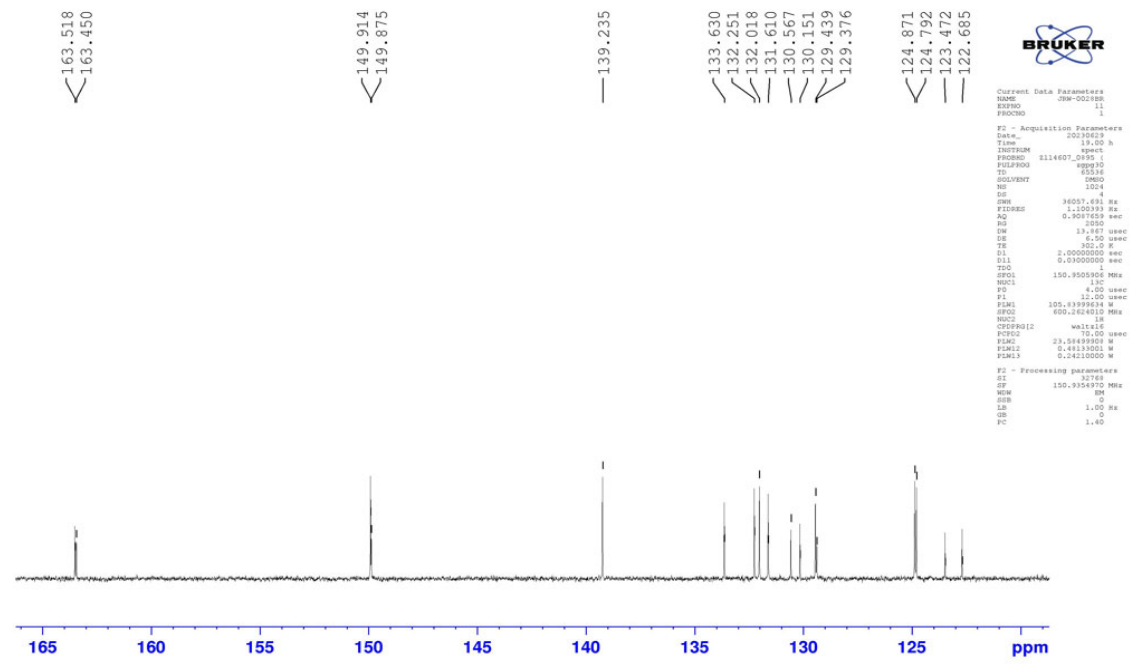


Figure S3. [13]C-NMR spectra of **NAP-Py-Br**

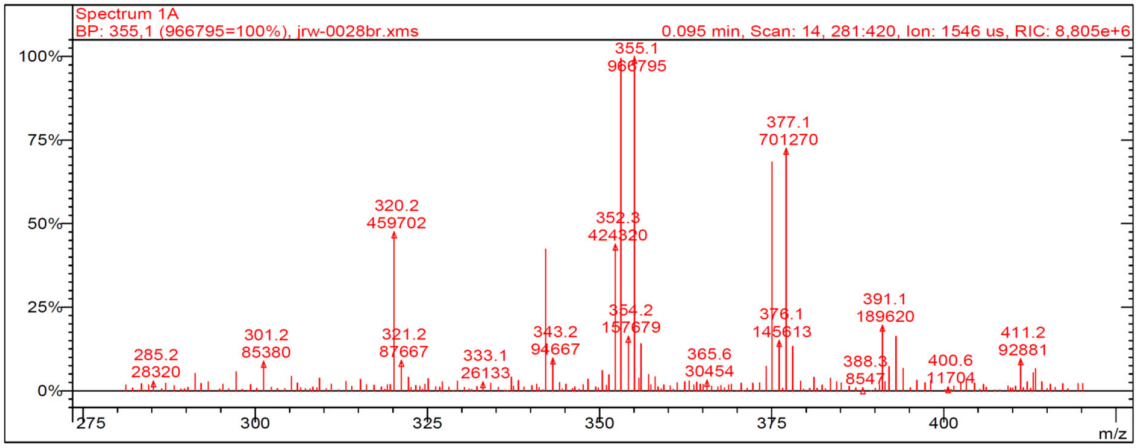


Figure S4. ESI-MS spectra of **NAP-Py-Br**

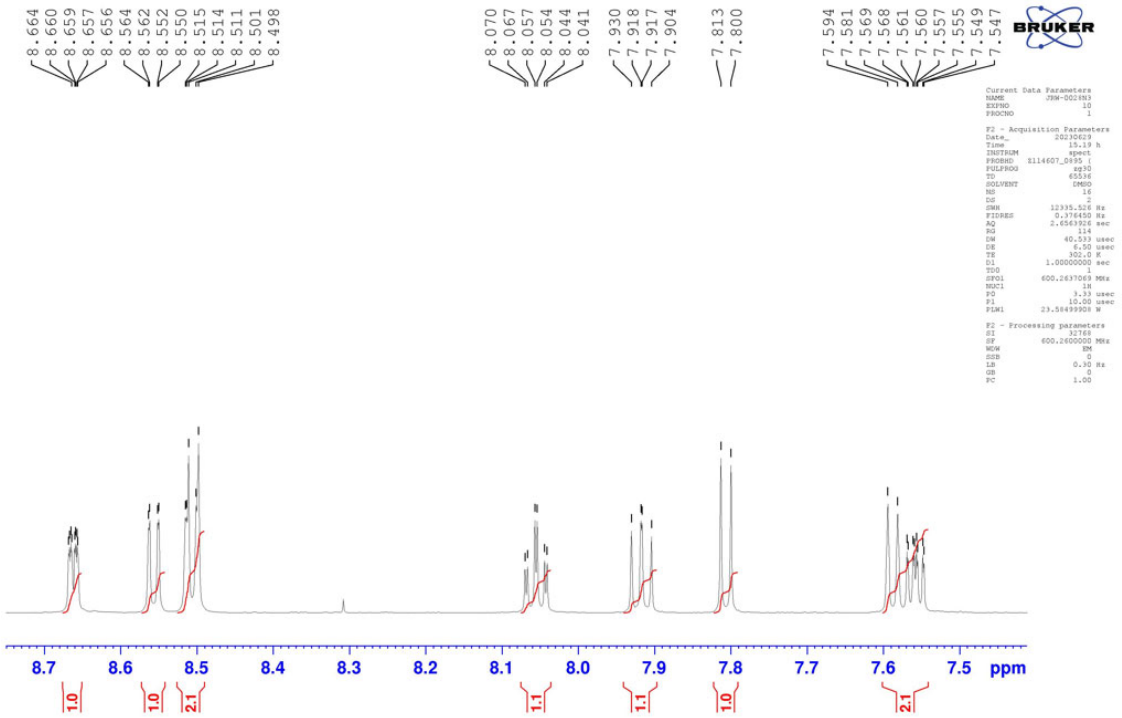


Figure S5. ^{1}H-NMR spectra of **NAP-Py-N$_3$**

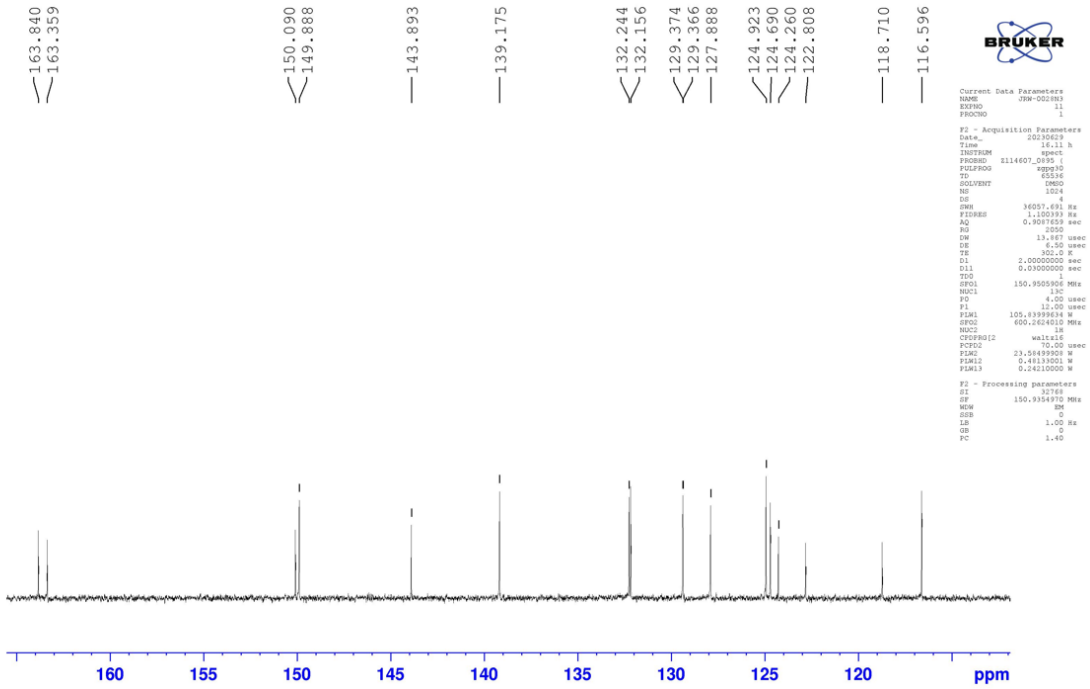


Figure S6. ^{13}C-NMR spectra of **NAP-Py-N$_3$**

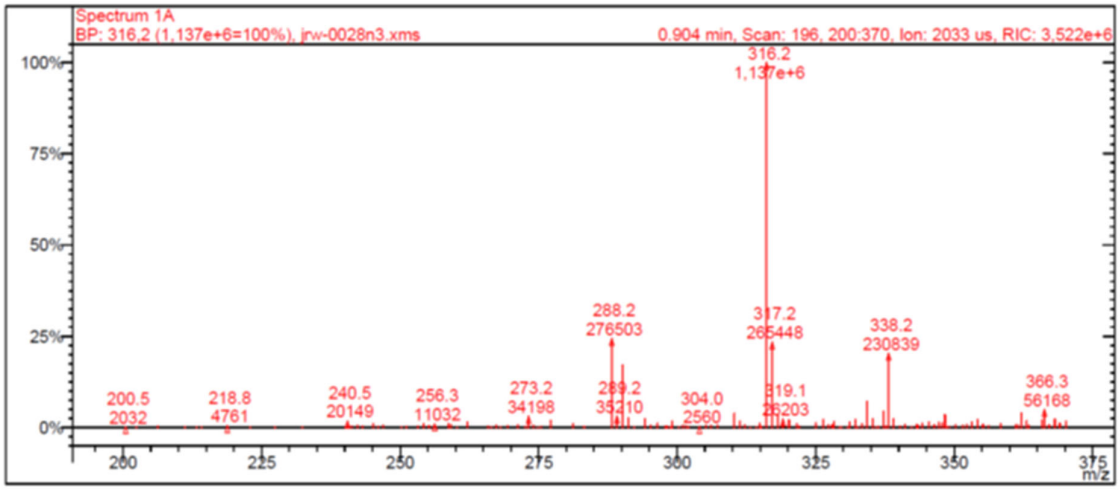


Figure S7. ESI-MS spectra of **NAP-Py-N$_3$**

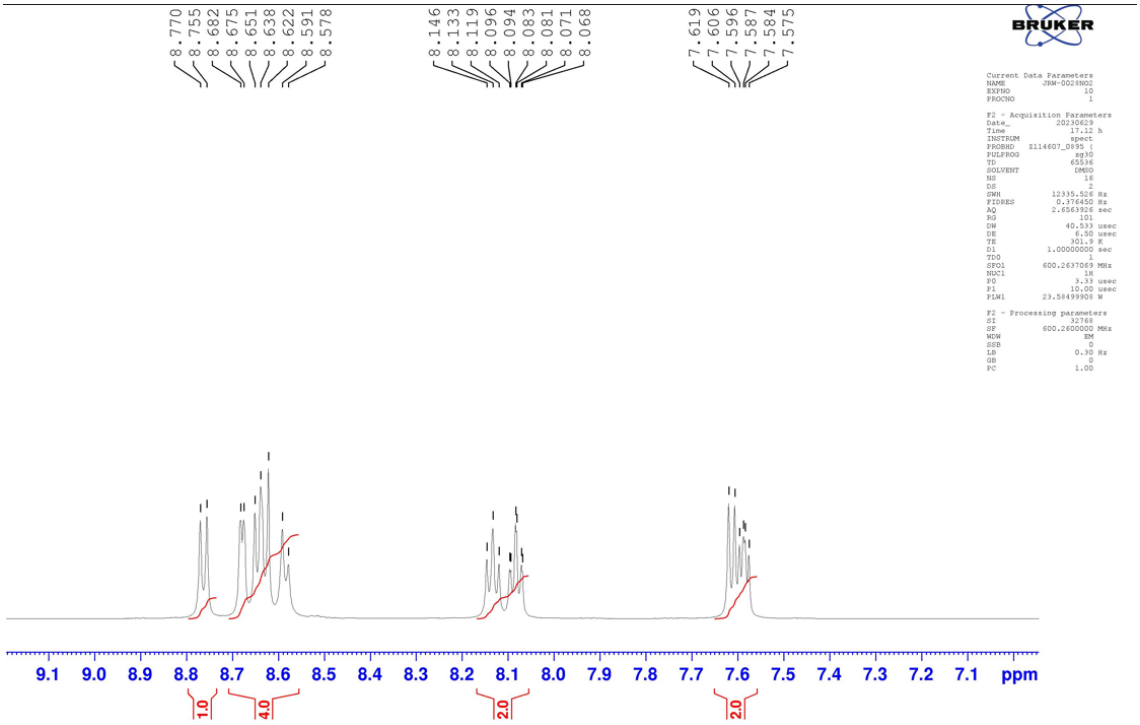


Figure S8. [1]H-NMR spectra of **NAP-Py-NO$_2$**

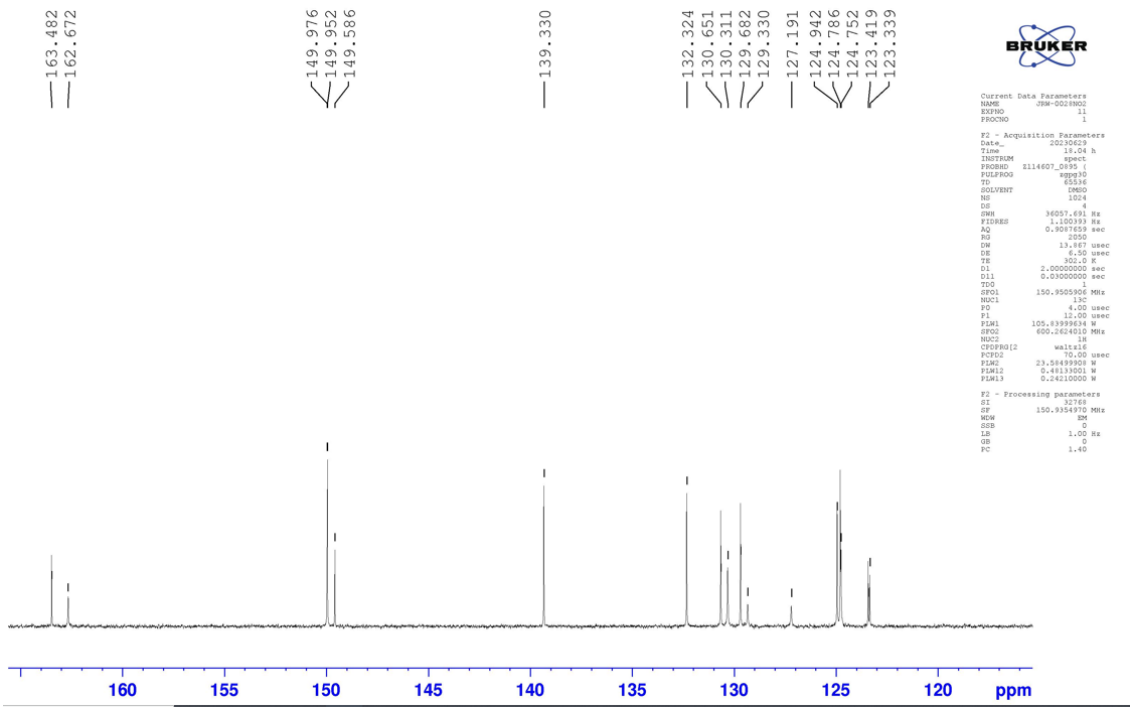


Figure S9. [13]C-NMR spectra of **NAP-Py-NO$_2$**

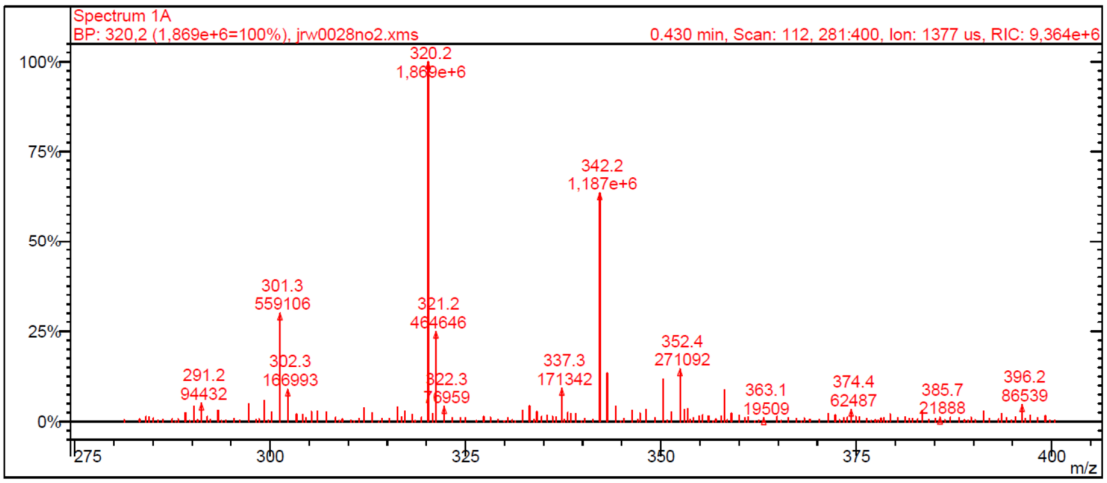


Figure S10. ESI-MS spectra of **NAP-Py-NO$_2$**

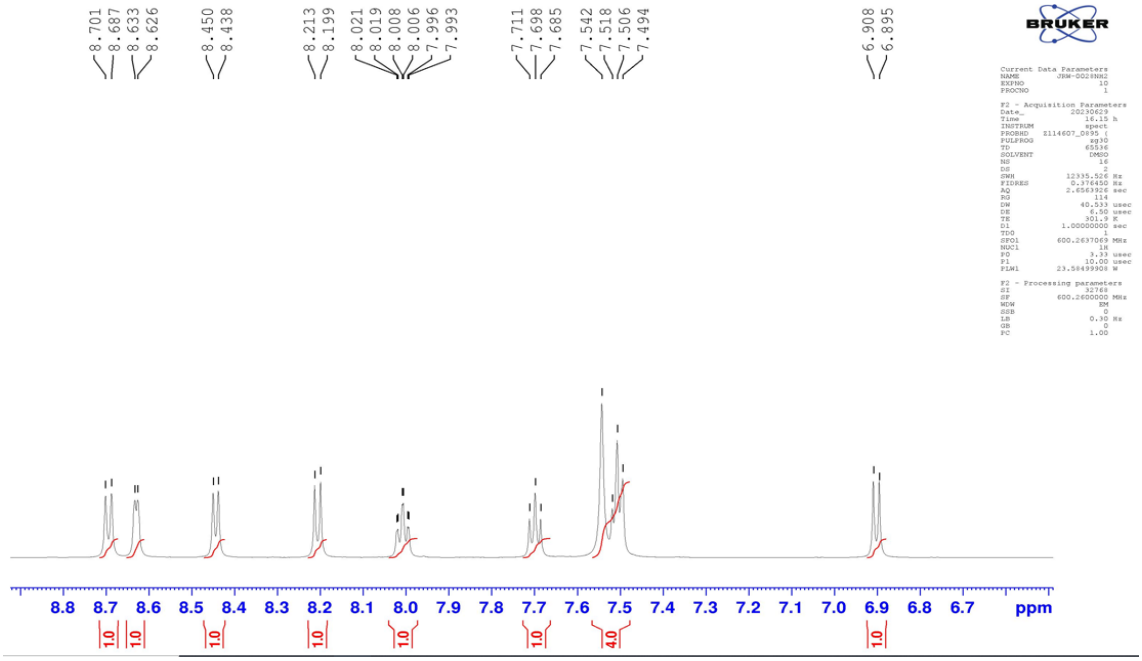


Figure S11. ^{1}H-NMR spectra of **NAP-Py-NH$_2$**

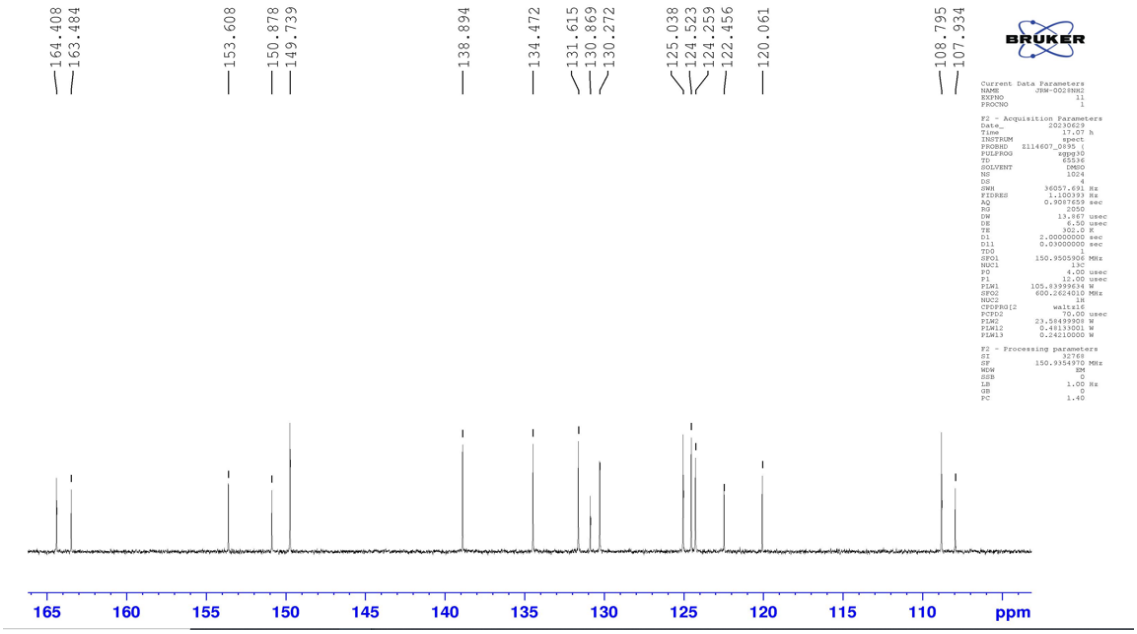


Figure S12. ^{13}C-NMR spectra of **NAP-Py-NH$_2$**

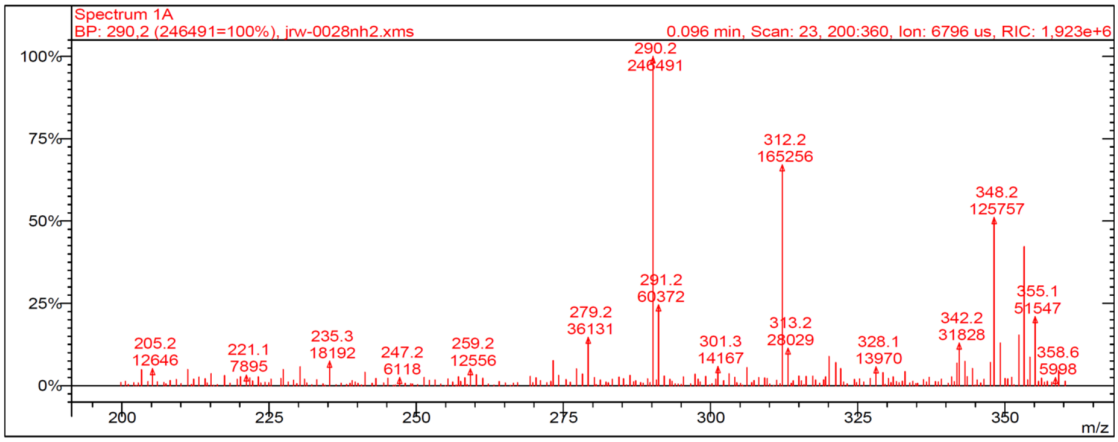


Figure S13. ESI-MS spectra of **NAP-Py-NH$_2$**

S1. Sun, Y., Li, C., Feng, X., Wang, C., Wang, N., Zhu, J., Wang, T., Cui, X. Si-coumarin-based fluorescent probes for ultrafast monitoring H$_2$S in vivo. *Dyes and Pigments* **2021**, *186*, 109059.

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S3. Zhang, L.; Li, S.; Hong, M.; Xu, Y.; Wang, S.; Liu, Y.; Qian, Y.; Zhao, J. A colorimetric and ratiometric fluorescent probe for the imaging of endogenous hydrogen sulphide in living cells and sulphide determination in mouse hippocampus. *Org. Biomol. Chem.* **2014**, *12*, 5115.

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S8. Zhang, J.; Guo, W. A new fluorescent probe for gasotransmitter H_2S: high sensitivity, excellent selectivity, and a significant fluorescence off–on response. *Chem. Commun.* **2014**, *50*, 4214-4217.

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