Electronic Supplementary Information

Simultaneous and visual detection of cysteamine based on Michael addition reaction with polydiacetylene liposome

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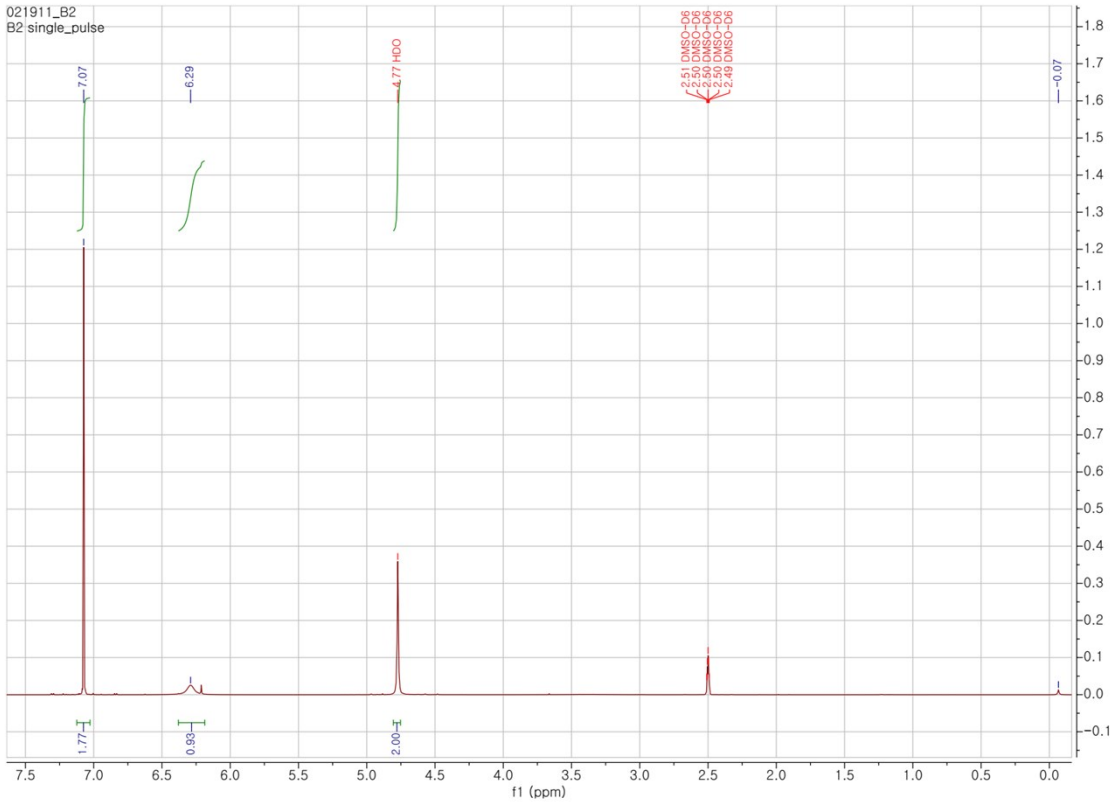


Figure S1. ^{1}H NMR (400 MHz) spectrum of N-Hydroxymethyl Maleimide (HM) in DMSO-d_6.

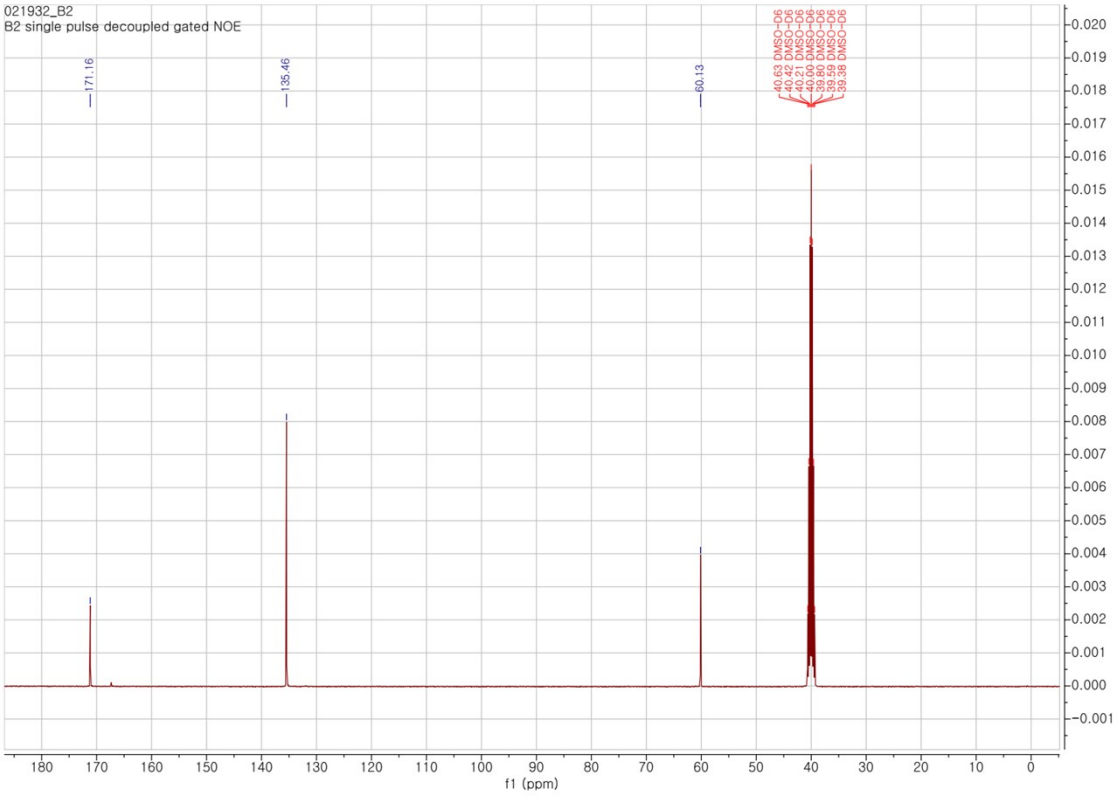


Figure S2. ^{13}C NMR (100 MHz) spectrum of N-Hydroxymethyl Maleimide (HM) in DMSO-d_6.

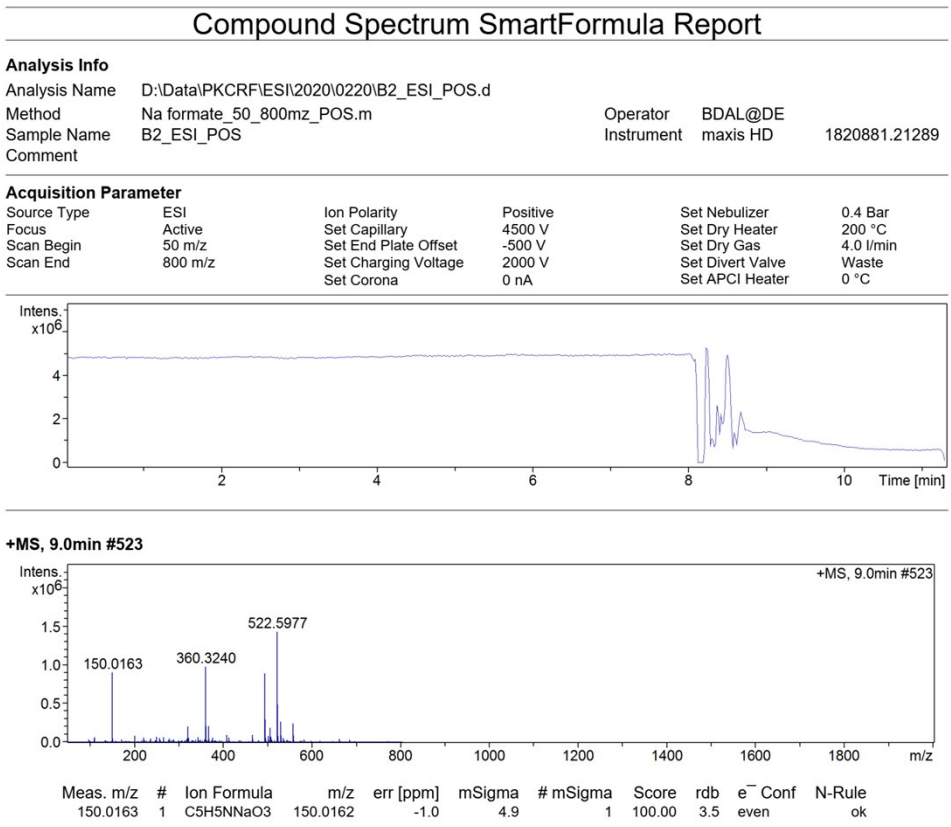


Figure S3. Mass spectrum (HRMS) of N-Hydroxymethyl Maleimide (HM)

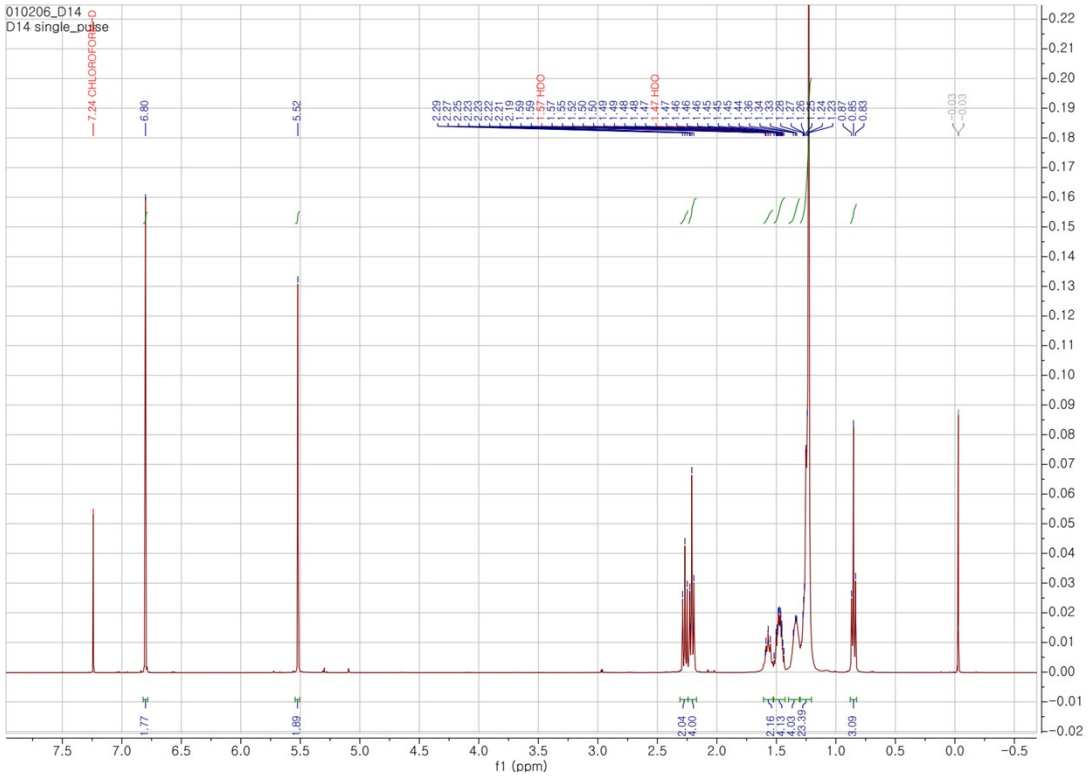


Figure S4. ^{1}H NMR (400 MHz) spectrum of PCDA-HM in $CDCl_3$

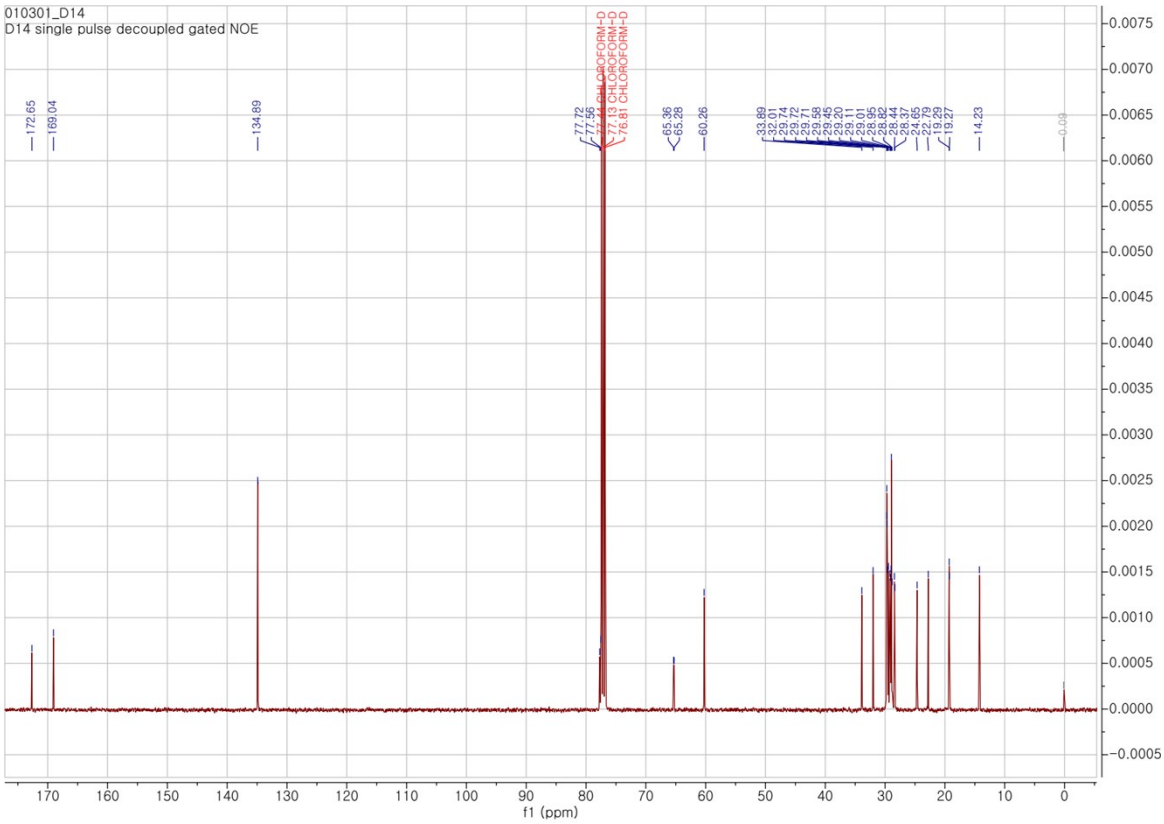


Figure S5. ^{13}C NMR (100 MHz) spectrum of **PCDA-HM** in $CDCl_3$

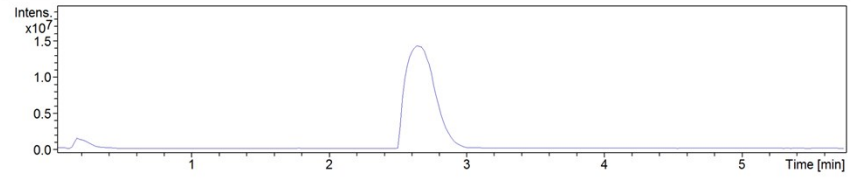
Compound Spectrum SmartFormula Report

Analysis Info

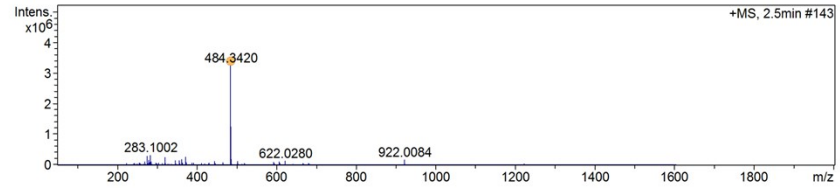
Analysis Name	D:\Data\PKCRF\DIP\2020\0102\D14_APCI_POS.d			
Method	APCI_TuneMix_50_1600mz_POS.m	Operator	BDAL@DE	
Sample Name	D14_APCI_POS	Instrument	maxis HD	1820881.21289
Comment				

Acquisition Parameter

Source Type	APCI	Ion Polarity	Positive	Set Nebulizer	2.0 Bar
Focus	Active	Set Capillary	4500 V	Set Dry Heater	200 °C
Scan Begin	50 m/z	Set End Plate Offset	-500 V	Set Dry Gas	1.0 l/min
Scan End	1600 m/z	Set Charging Voltage	2000 V	Set Divert Valve	Waste
		Set Corona	7000 nA	Set APCI Heater	350 °C

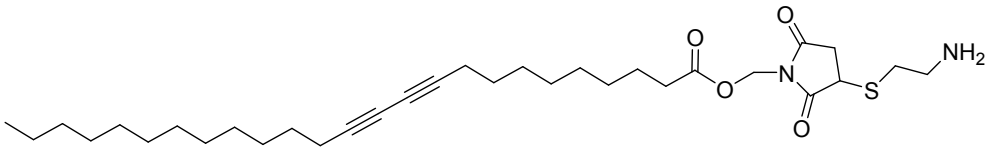


+MS, 2.5min #143



Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# mSigma	Score	rdb	e¯ Conf	N-Rule
484.3420	1	C30H46NO4	484.3421	0.2	27.2	1	100.00	8.5	even	ok
	2	C14H36N20	484.3426	1.3	94.5	2	5.97	7.0	odd	ok
	3	C15H42N13O5	484.3426	1.3	100.7	3	4.46	1.5	even	ok

Figure S6. Mass spectrum (HRMS) of **PCDA-HM**



Chemical Formula: $C_{32}H_{52}N_2O_4S$
Exact Mass: 560.36
Molecular Weight: 560.84

PCDA-HM + Cysteamine

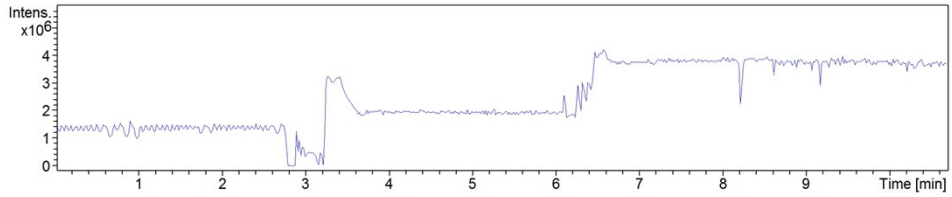
Compound Spectrum SmartFormula Report

Analysis Info

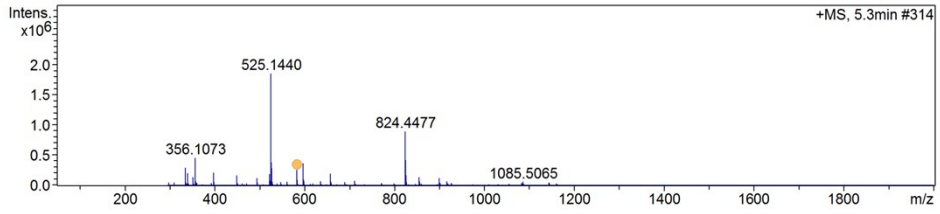
Analysis Name	D:\Data\PKCRF\ESI\2020\0214\D14+CYSte_ESI_POS.d		
Method	TuneMix_300_2000mz_POS.m	Operator	BDAL@DE
Sample Name	D14+CYSte_ESI_POS	Instrument	maxis HD 1820881.21289
Comment			

Acquisition Parameter

Source Type	ESI	Ion Polarity	Positive	Set Nebulizer	0.4 Bar
Focus	Active	Set Capillary	4500 V	Set Dry Heater	200 °C
Scan Begin	300 m/z	Set End Plate Offset	-500 V	Set Dry Gas	4.0 l/min
Scan End	2000 m/z	Set Charging Voltage	2000 V	Set Divert Valve	Waste
		Set Corona	0 nA	Set APCI Heater	0 °C



+MS, 5.3min #314



Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# mSigma	Score	rdb	e⁻ Conf	N-Rule
583.3535	1	C29H51N4O6S	583.3524	-1.9	13.5	1	76.59	6.5	even	ok
	2	C30H47N8O2S	583.3537	0.4	21.0	2	100.00	11.5	even	ok
	1	C32H52N2NaO4S	583.3540	0.9	22.9	1	100.00	7.5	even	ok

Figure S7. Mass spectrum (HRMS) of **PCDA-HM** + Cysteamine

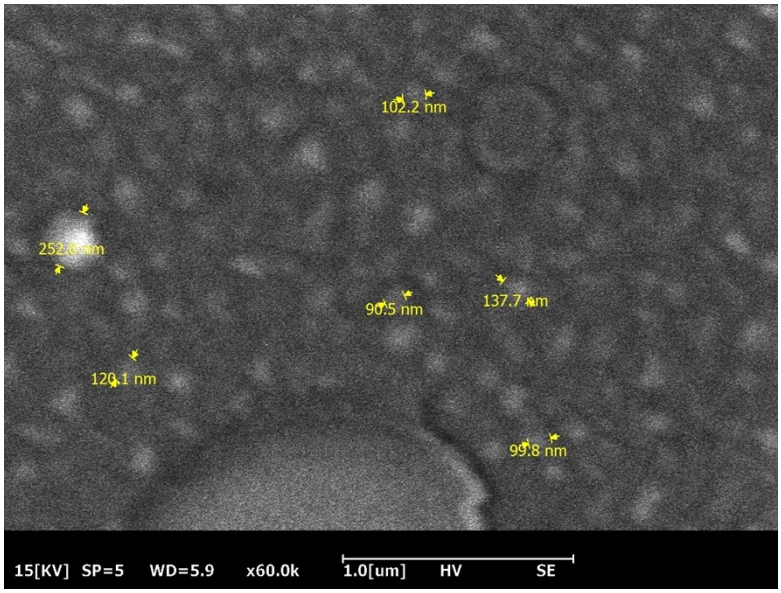


Figure S8. SEM images of 100 μM **PDA-HM** after 254 nm UV irradiation.

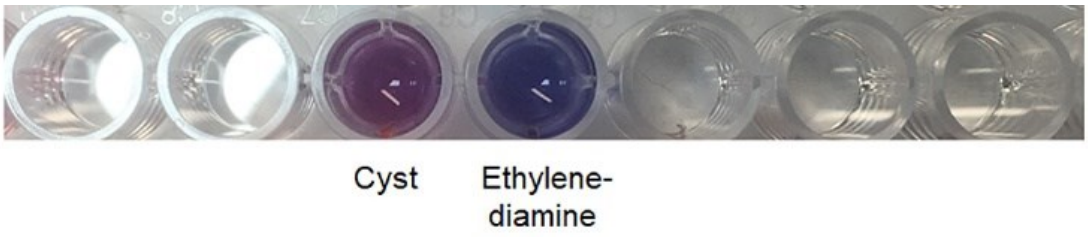


Figure S9. Colorimetric responses of **PDA-HM** with Cyst and Ethylenediamine.

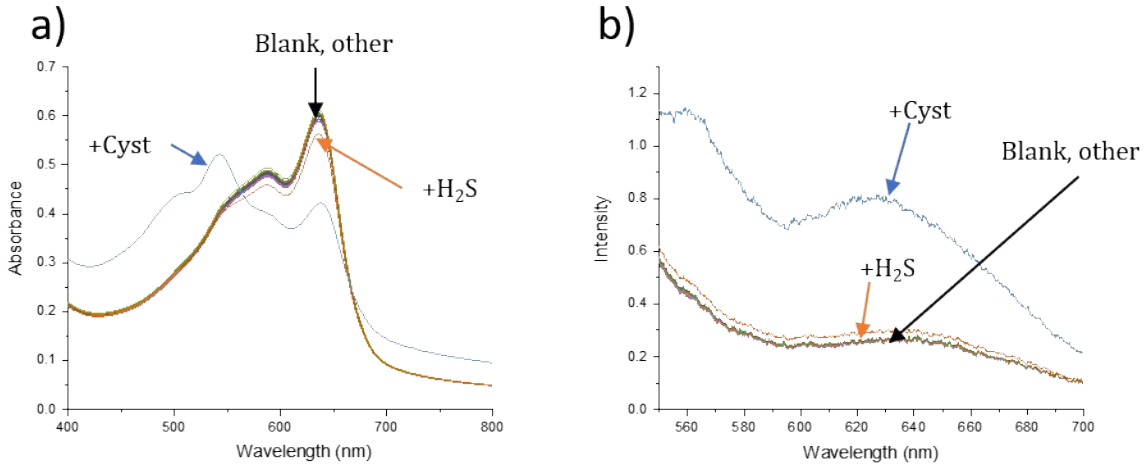


Figure S10. (a) UV/Vis and (b) fluorescence spectra (λ_{ex} = 540 nm, slit: 5 nm/5 nm) of **PDA-HM** (200 μM) in the presence of Cyst (200 μM), GSH, Cys, Hcy, $NasS_2O_7$, KSCN, thioglycolic acid, 2-mercaptoethanol, H_2S (600 μM) in HEPES buffer (10 mM, pH 7.4).

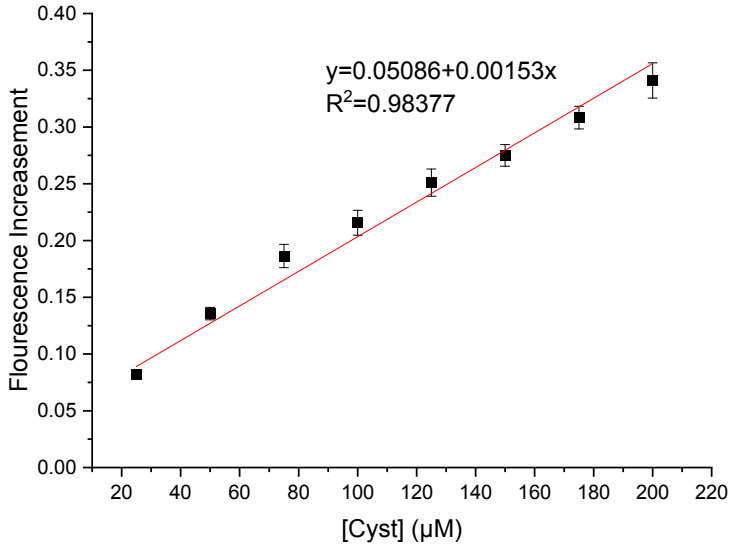


Figure S11. Plots of fluorescence intensity of PDA-HM as a function of Cysteamine concentrations (0 - 200 μM).

Tabble S1.

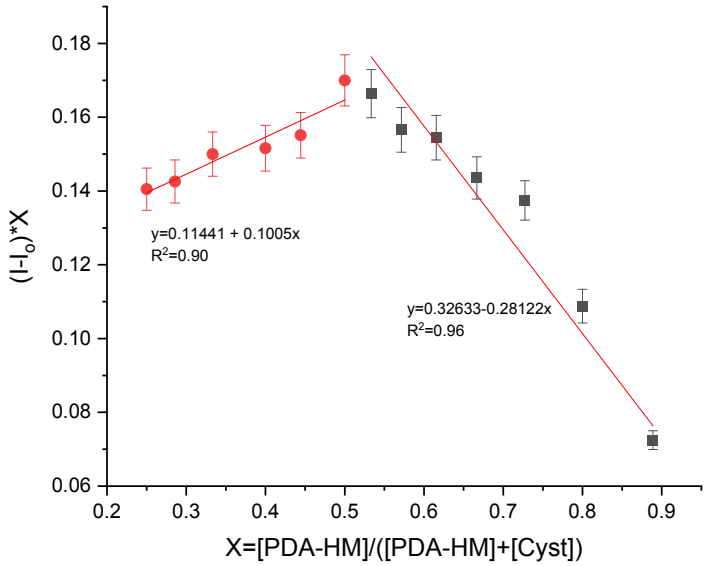


Figure S12. The Job's plot of **PDA-HM** in a HEPES buffer (10 mM, pH 7.4).

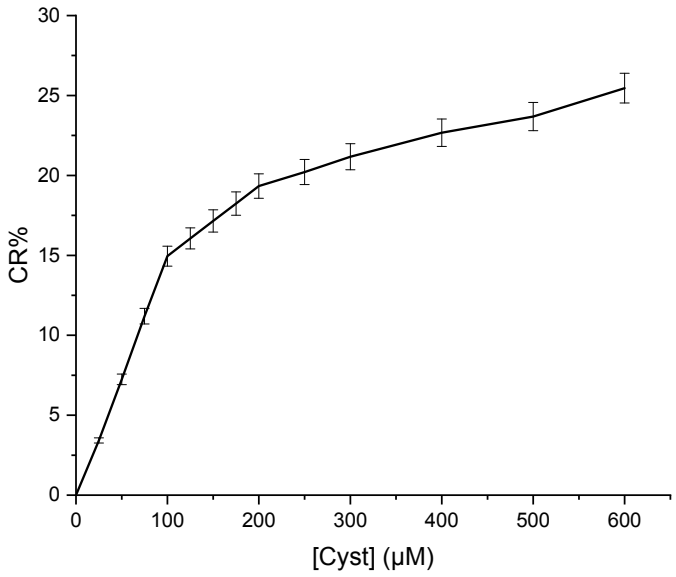


Figure S13. Quantitative colorimetric response of **PDA-HM** (200 μM) in the presence of various concentration Cysteamine in HEPES buffer (10 mM, pH 7.4).

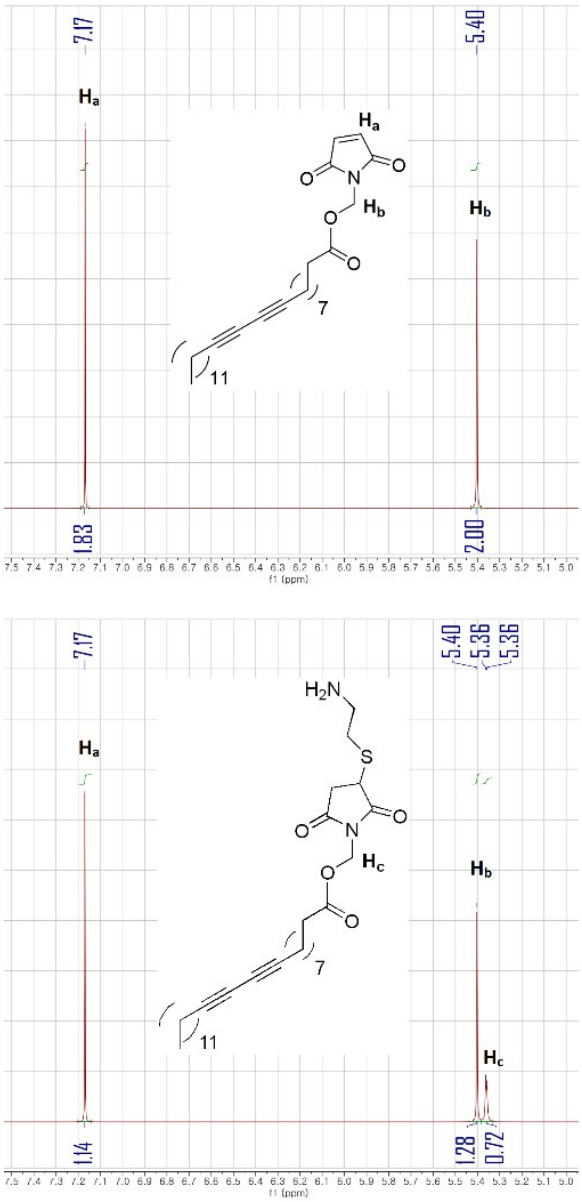
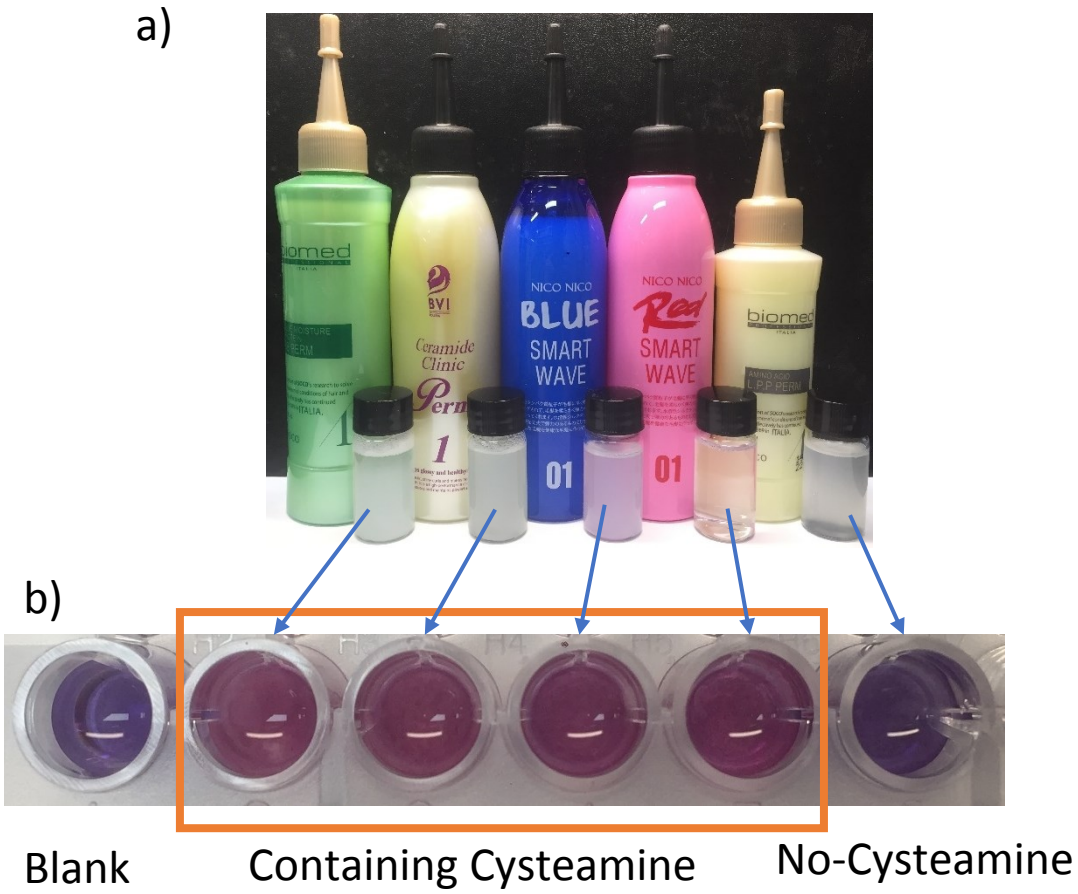


Figure S14. Partial ^{1}H NMR spectra (400 MHz) of **PCDA-HM** (5mM) following the addition of Cyst to DMSO-d_6.



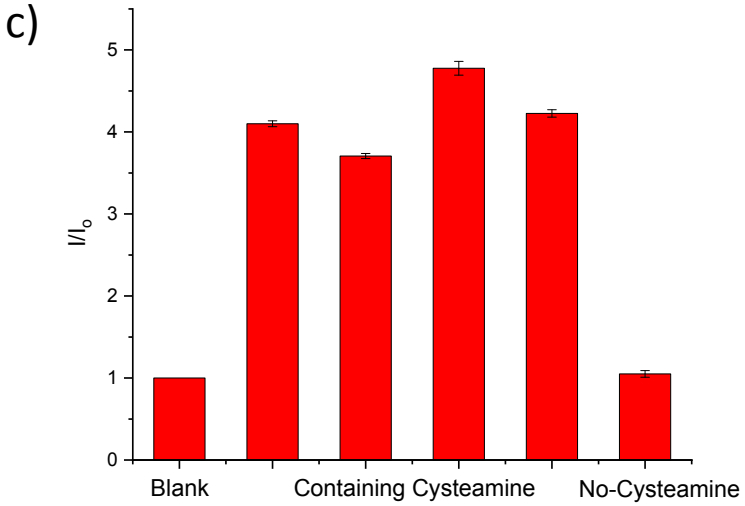


Figure S15. (a) Real samples and corresponding stock solution (0.5 mL of real samples were diluted with 9.5 mL of HEPES buffer (10 mM, pH 7.4)); (b) Colorimetric responses and (c) Plot of relative fluorescence intensities (at 625 nm) of **PDA-HM** (200 μM) in the presence of real sample stock solutions of (25%) containing Cysteamine and do not containing Cysteamine.

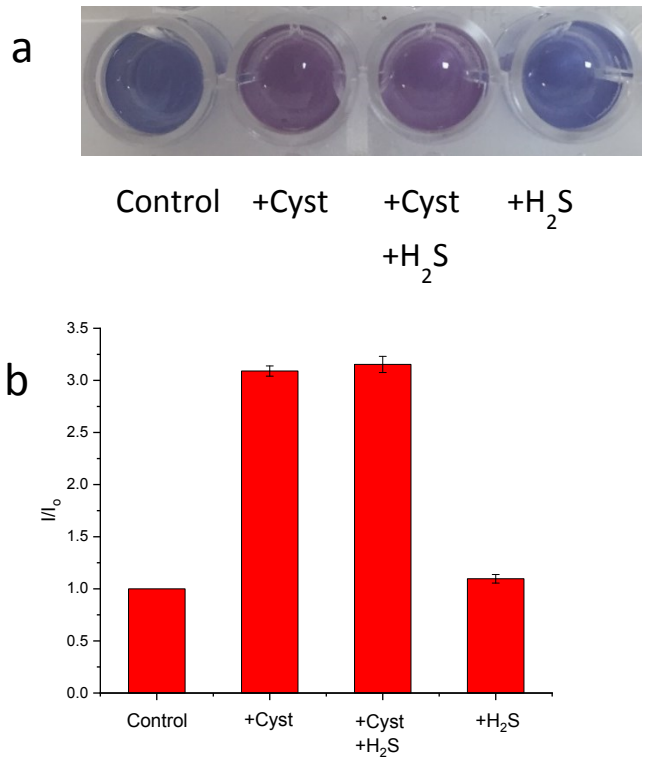


Figure S16. (a) Colorimetric responses; (b) Plot of relative fluorescence intensities (at 625 nm) of **PDA-HM** (200 μM) in the presence of 'Biomed – Amino acid L.P.P Perm' stock solutions (25%) and Cyst (200 μM); H_2S (1 mM); **Anti-interference ability of the detection method**: Cyst and H_2S was added to stock solution of commercial 'Biomed – Amino acid L.P.P Perm', that does not contain Cysteamine.