Supplementary Information

A Fast Response Fluorescence Probe Specific for Hypochlorous Acid Detection and Its Applications in Bioimaging

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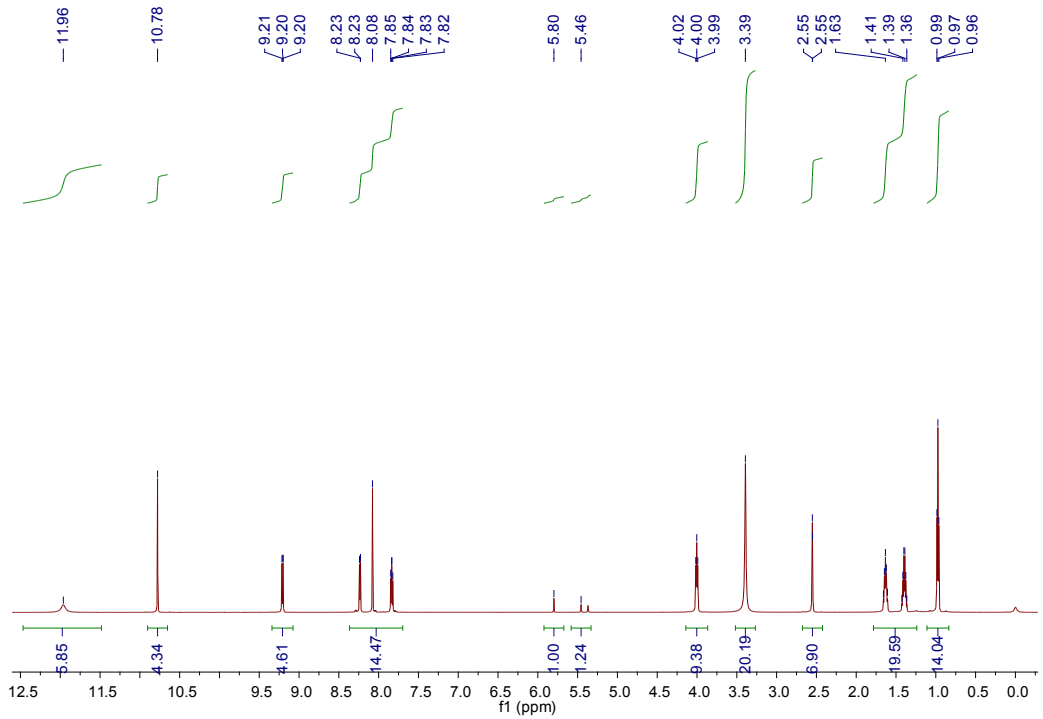

Fig. S1 ^{1}H NMR of **NA** (600 MHz, DMSO-d_6).

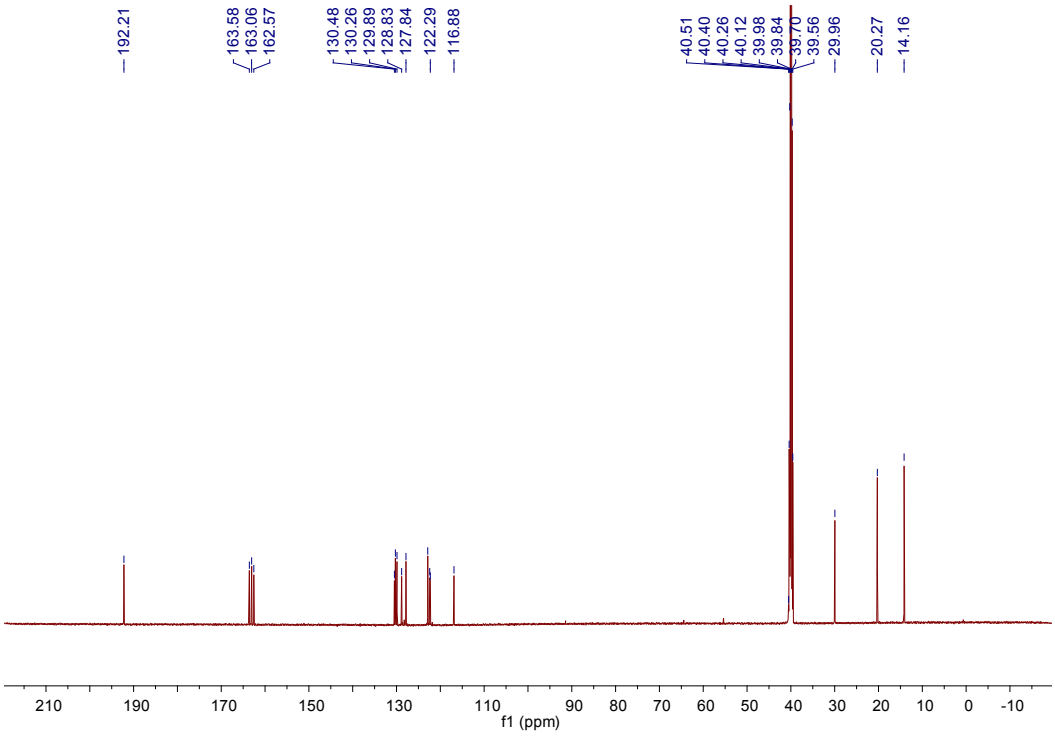

Fig. S2 ^{1}H NMR of **NA** (150 MHz, DMSO-d_6).

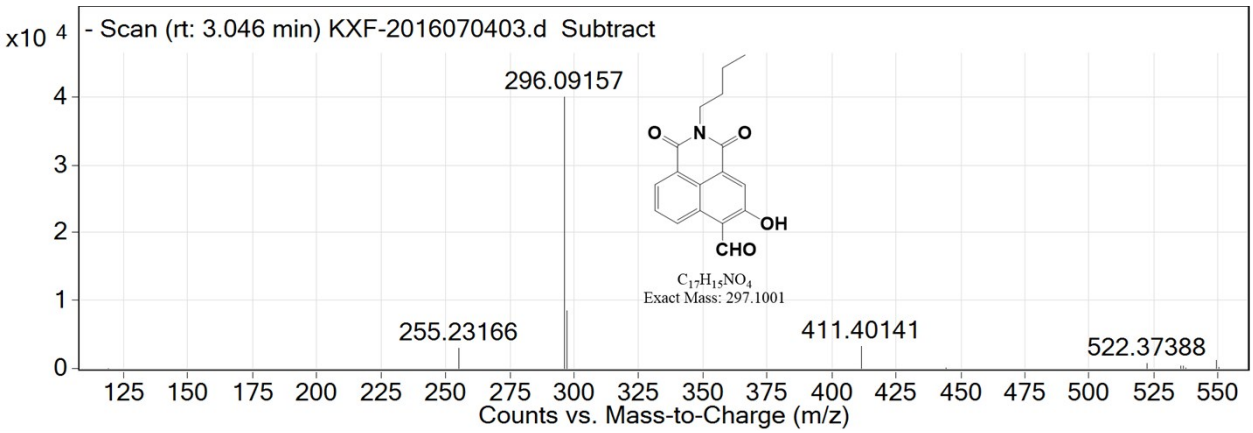

Fig. S3 HR MS of **NA**.

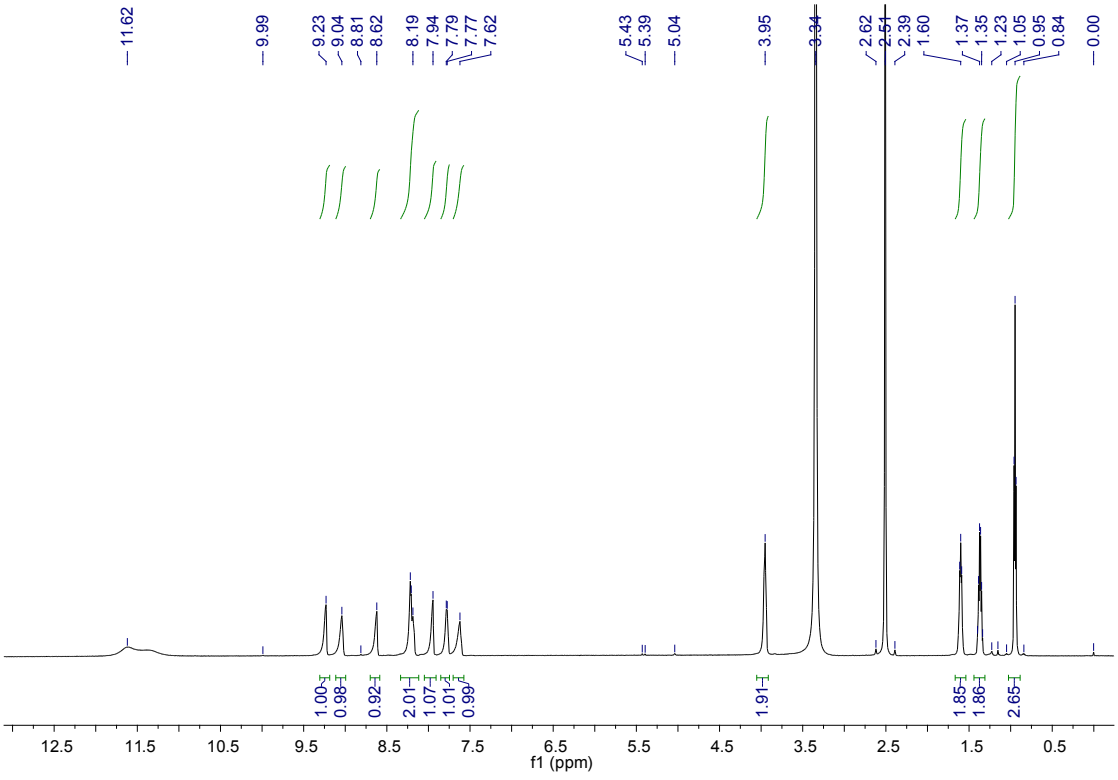

Fig. S4 ^{1}H NMR of **DNPH-NA** (600 MHz, DMSO-d_6).

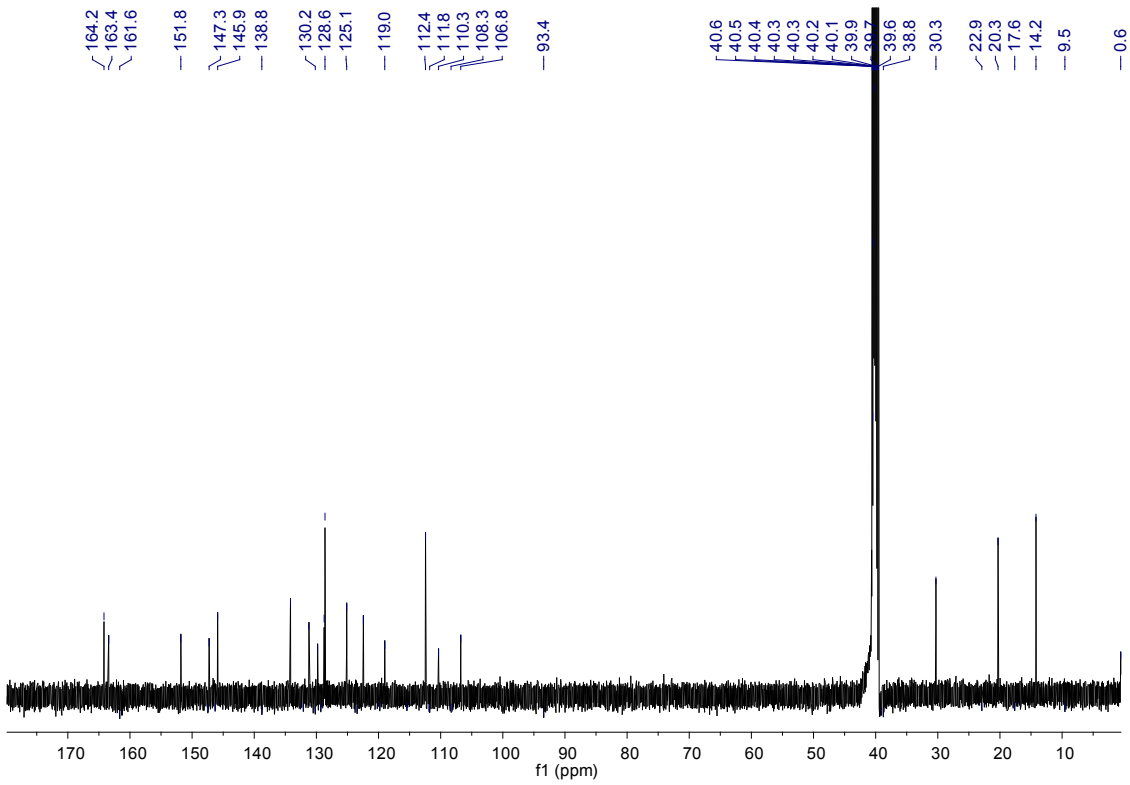

Fig. S5 ^{13}C NMR of **DNPH-NA** (150 MHz, DMSO-d_6).

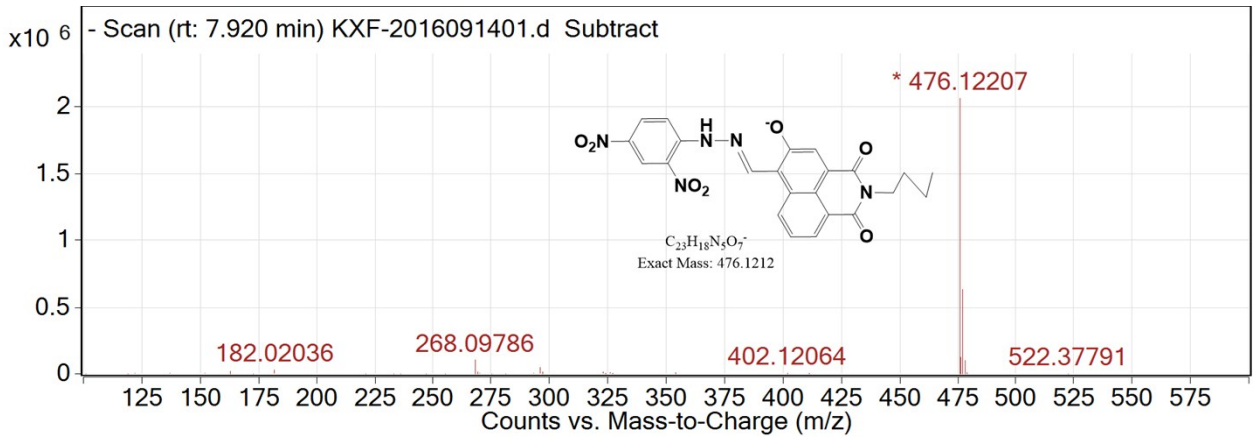

Fig. S6 HR MS of **DNPH-NA**.

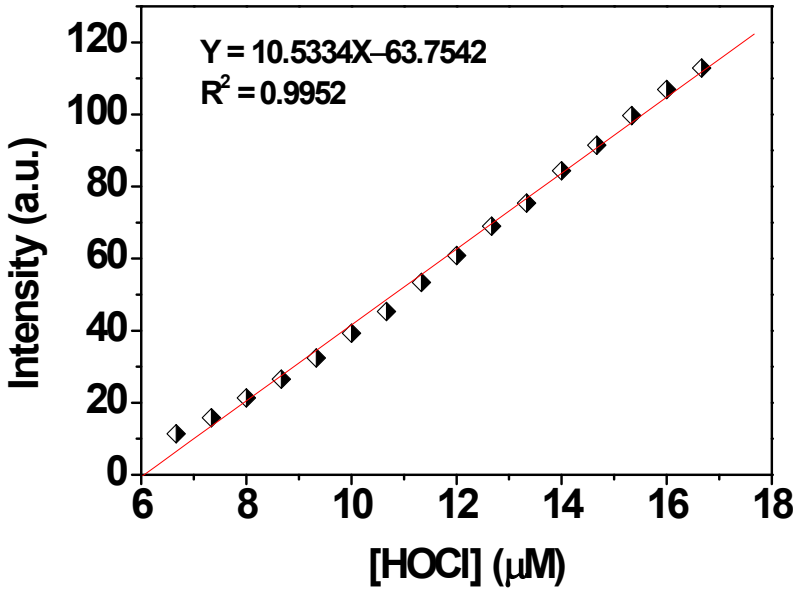

Fig. S7 Fluorescence spectra of **DNPH-NA** (3 μM) in (THF:PBS=3:7, v/v; pH 7.4) in titration point line fitting.

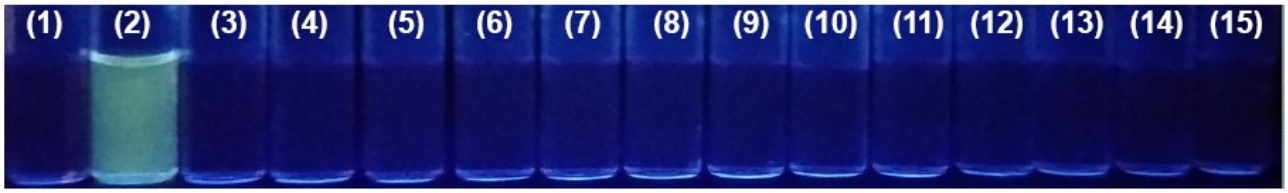

Fig. S8 Changes in fluorescence color of **DNPH-NA** (10 μM) in the presence of various ROS and anions (120 μM): (1) **DNPH-NA** only, (2) HOCl, (3) H_2O_2, (4) $^1O_2$, (5) $ONOO^-$, (6) $\cdot OH$, (7) $^\bullet O_2^-$, (8) NO_2^-, (9) NO_3^-, (10) PO_4^{3-}, (11) Pi, (12) SO_4^{2-}, (13) HCO_3^-, (14) Cl^-, (15) F^-.

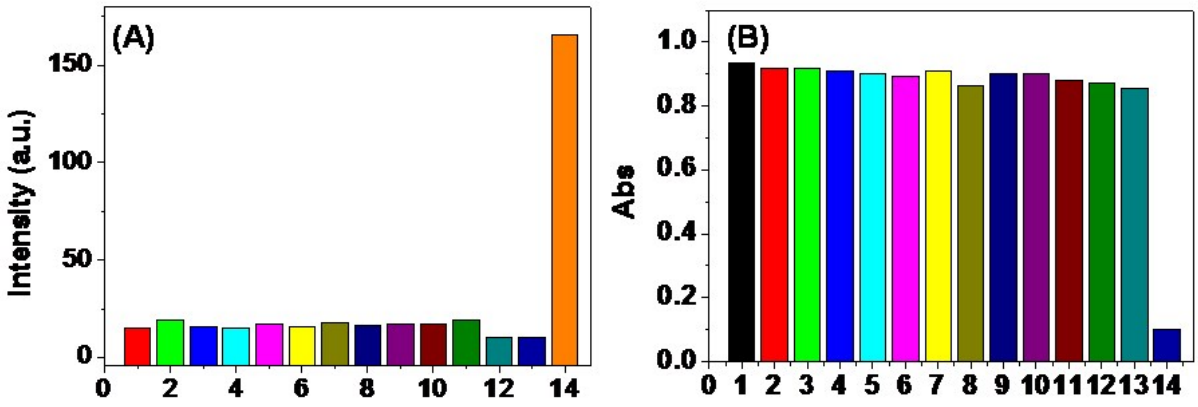

Fig. S9 Fluorescence response of **DNPH-NA** (10 μM) towards various biological cations (150 μM) in PBS buffer (THF:H_2O=3:7, v/v; pH 7.4). The cations include 1. Li^+, 2. Na^+, 3. K^+, 4. Ca^{2+}, 5. Mg^{2+}, 6. Ba^{2+}, 7. Al^{3+}, 8. Fe^{3+}, 9. Cr^{3+}, 10. Zn^{2+}, 11. Co^{2+}, 12. Mn^{2+}, 13. Cu^{2+}, 14. HOCl. The excitation and emission wavelength are 430/518 nm for **DNPH-NA**.

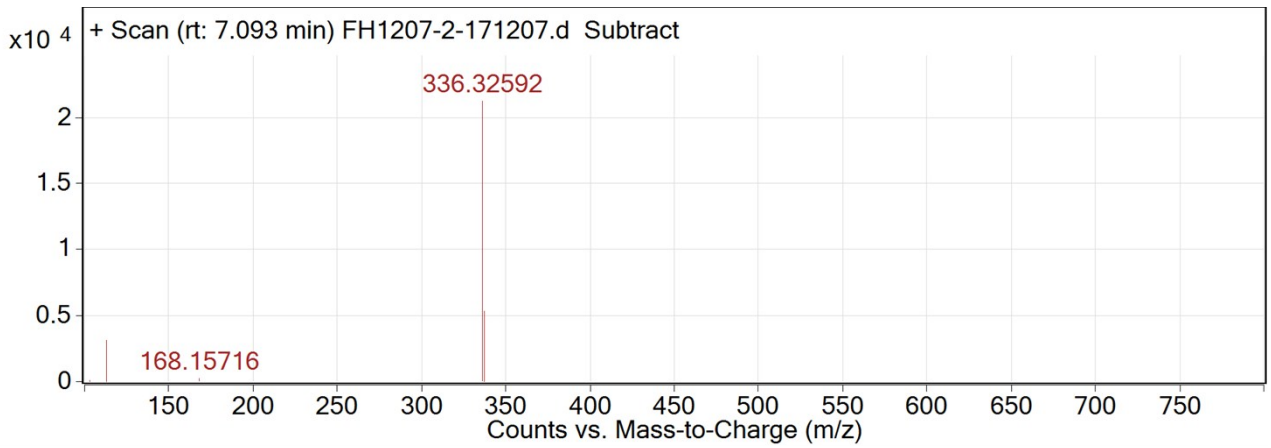

Fig. S 10 HR MS of **DNPH-NA** in the presence of HOCl.

Table S1. Some recently reported fluorescent probes for HOCl detection [S1-9].

Probes	Detection limit	Solvent	Colour changes	Ex/Em (nm)	emission enhancement	Response time	Intracellular analysis	I*n vivo/vitro* sensing	Ref
HQ	0.31 μM	PBS–DMSO (1 : 9, v/v, 7.4).	--	495/370	23.5-fold	within 10 min	Exogenous HOCl in HeLa cells	--	1
MPhSe–BOD	--	PBS-CH_3CN (7 : 3, v/v, 7.4)	--	460/510	~5-fold	5 min	Endogenous HOCl in macrophage	--	2
1b	0.356 μM	PBS-CH_3CN (8 : 2, v/v, 7.4)	--	398/455	42-fold	5 min	Exogenous HOCl in HepG2 cells	--	3
RSTPP	9.00 nM	PBS (7.4)	Colourless -pink more than	553/580	200-fold	2 min	Endogenous HOCl in mitochondria of macrophage (subcellular level)	--	4
AC-ClO	25 nM	DMF-PBS solution (4:1, v/v; 10 mM PBS, pH 7.4)	--	480/576	372-fold	within 2 min)	exogenous and endogenous ClO^- in live Raw 264.7 cells	-	5
1	--	DMF-PBS solution (1:9, v/v; 10 mM PBS, pH 7.4)	--	480/542	--	1 min	Exogenous HOCl in HeLa cells and endogenous HOCl in macrophage (single cell level by flow cytometry analysis)	--	6
FBS	0.20 μM	in KH_2PO_4 buffer (50 mM, pH 7.4)	-	498/523	--	--	--	(*Ex vivo*) intestinal HOCl in Drosophila melanogaster (endogenous HOCl)	7
MMSiR	-	DMF-PBS solution (0.9:99.1, v/v; PBS, pH 7.4)	Colourless -blue	620/670	--	A few seconds	Endogenous HOCl in neutrophils	(*In vivo*) mouse peritonitis (endogenous HOCl)	8
PZ-Py	17.9 nM	in PBS (pH 7.3, 10 mM, containing	-	400/562	40.5-fold	A few seconds	Exogenous HOCl in mitochondria HeLa,	(*In vivo*) nude mice (exogenous HOCl)	9

		0.5% DMSO)					endogenous HOCl in mitochondria of RAW 264.7 (subcellular level)		
Ptz-AO	2.7 nM	in H_2O	-	475/540	75-fold	5 s	Exogenous HOCl in INS-1 □-islet cells and endogenous HOCl in macrophage	--	10
FDOCl-1	2.62 nM	in PBS (pH 7.2, 10 mM, containing 0.1% EtOH)	Colourless -blue	620/686	78-fold	30 s	Endogenous HOCl in macrophage	(*In vivo*) HOCl in mice arthritis (endogenous HOCl)	11

References:

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