Electronic Supplementary Material (ESI) for Photochemical & Photobiological Sciences.

A novel Schiff base derivative of pyridoxal for the optical sensing of Zn^{2+} and cysteine

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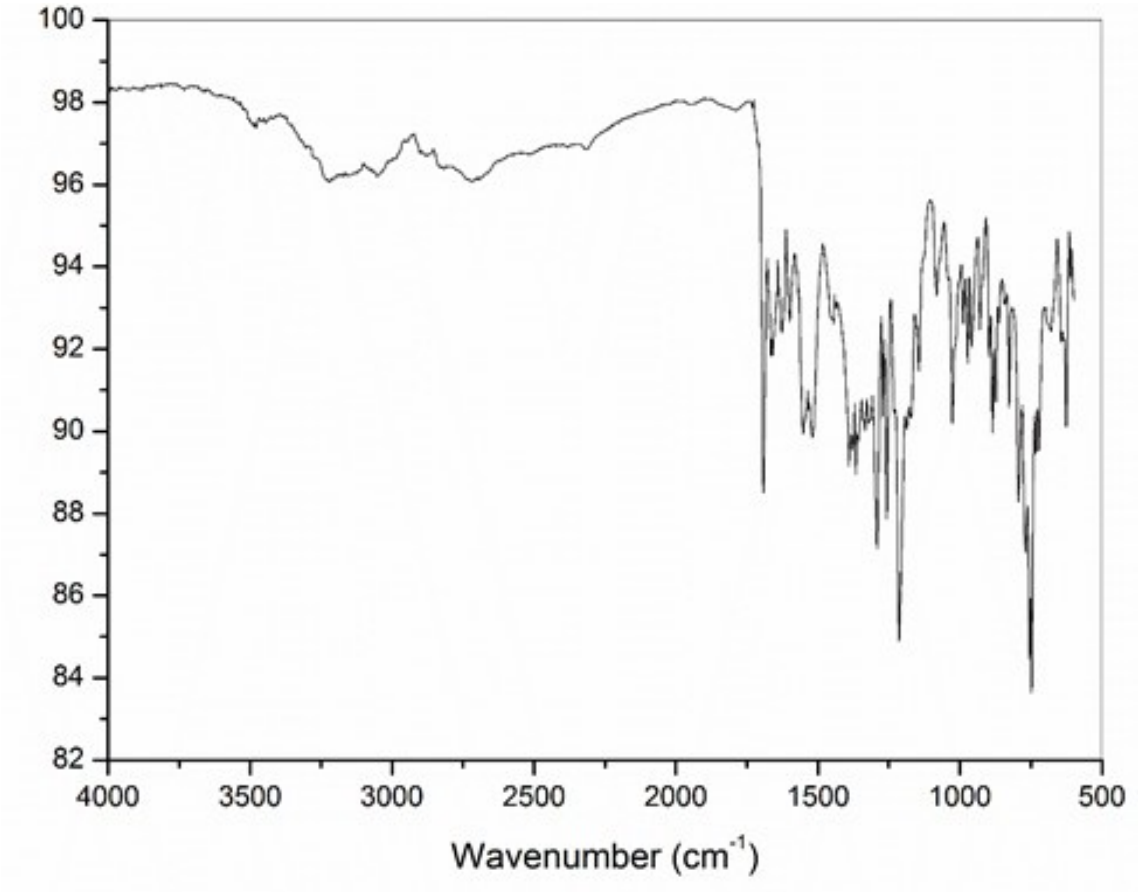

Fig. S1. ATR-FTIR spectrum of **NPY.**

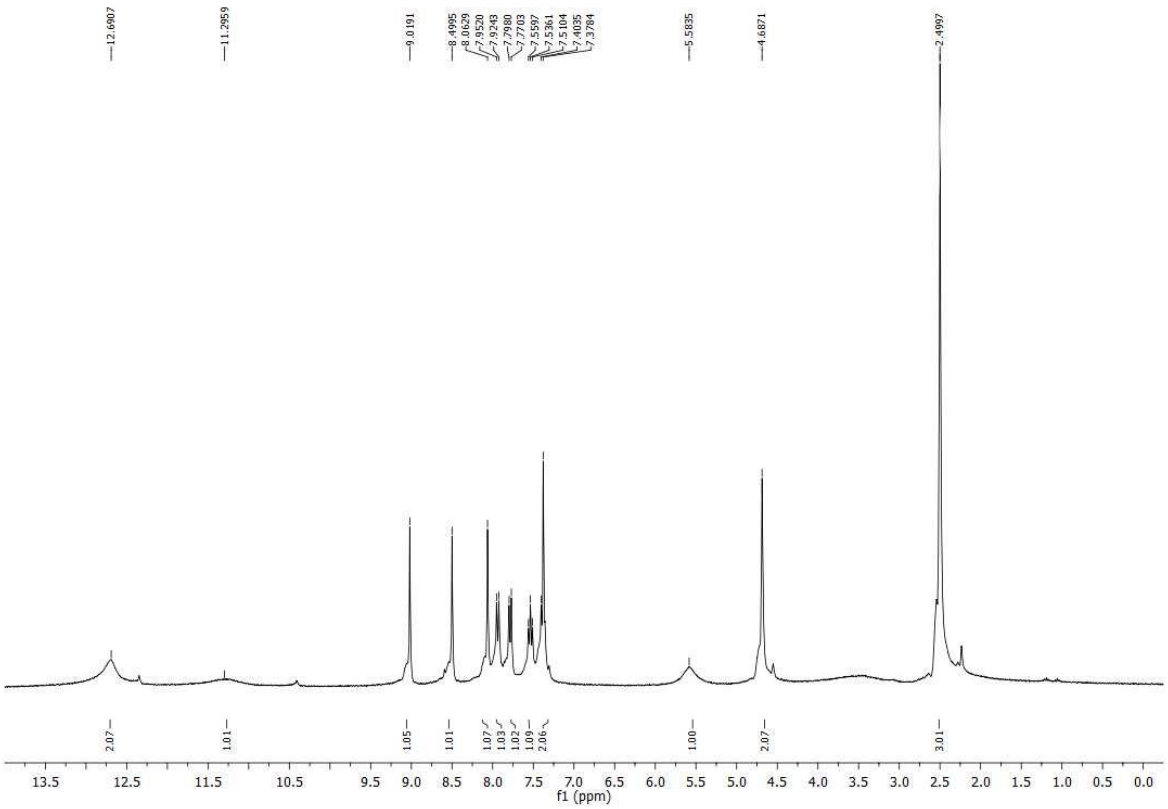

Fig. S2. ^{1}H NMR spectrum of **NPY** in DMSO-d_6.

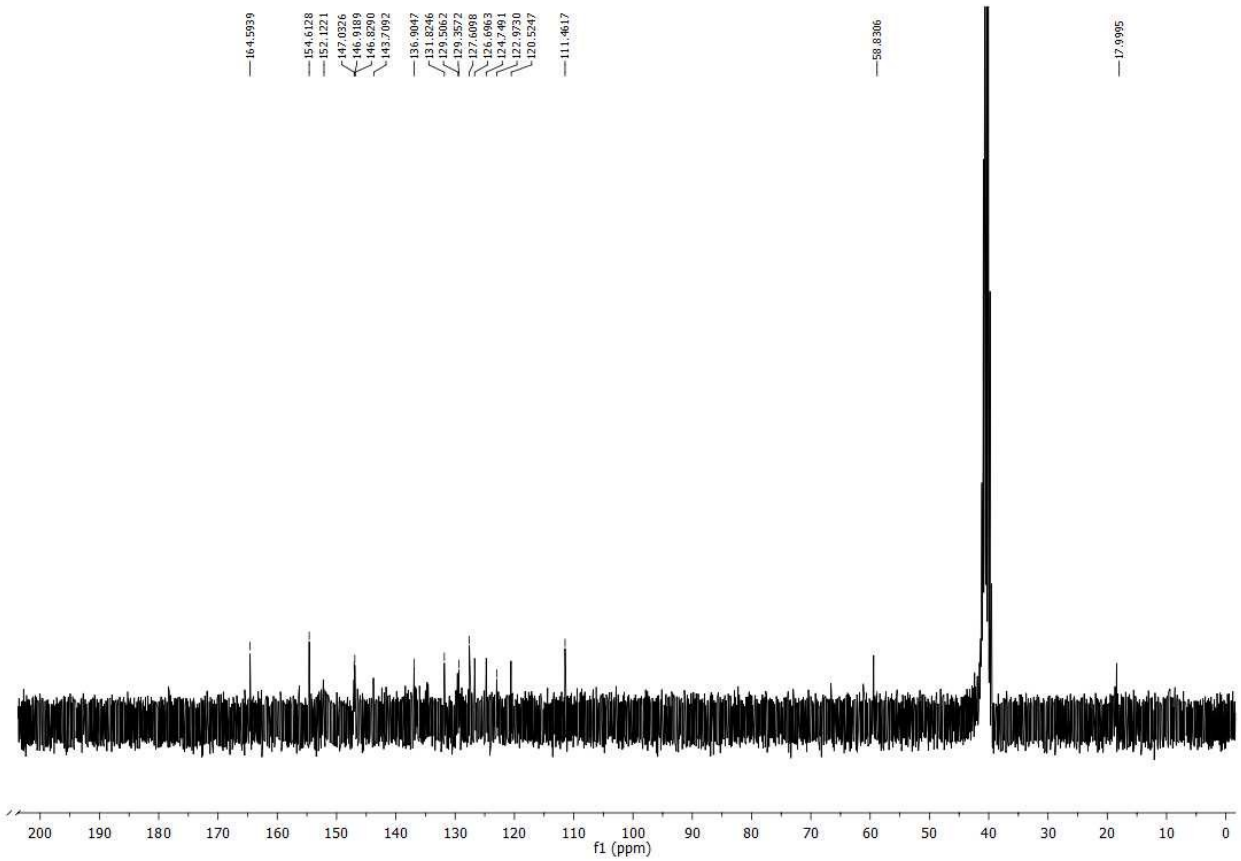

Fig. S3. ^{13}C-NMR spectrum of **NPY** in DMSO-d_6.

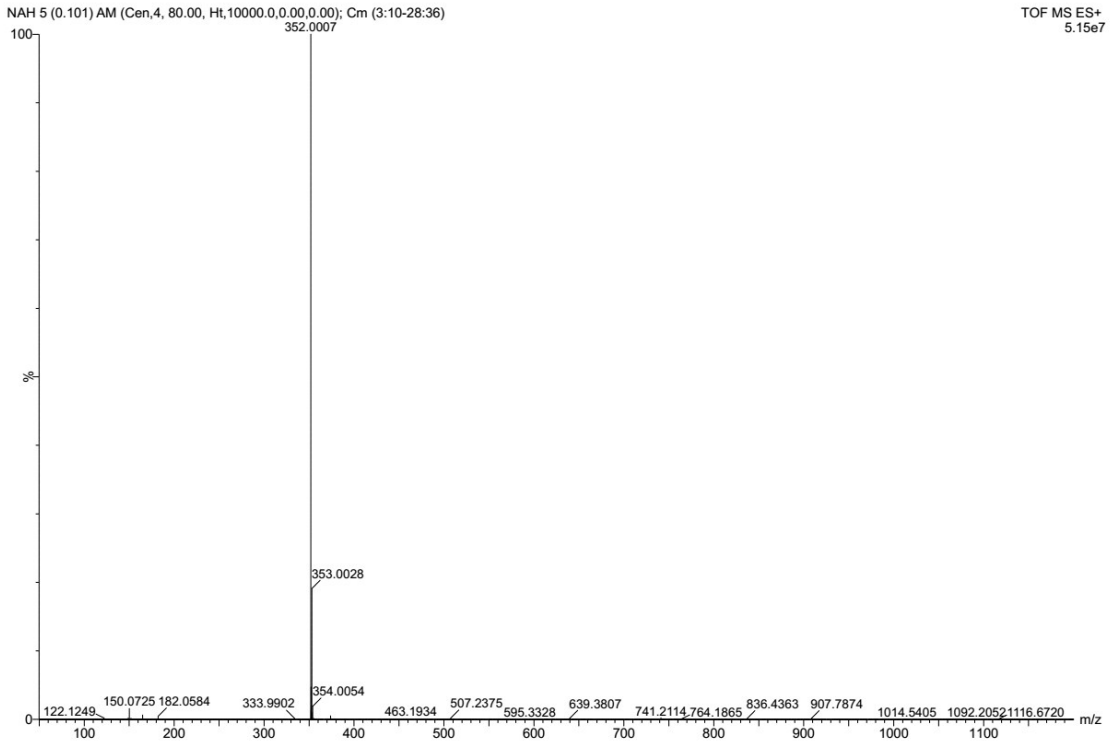

Fig. S4. HRMS spectrum of **NPY**.

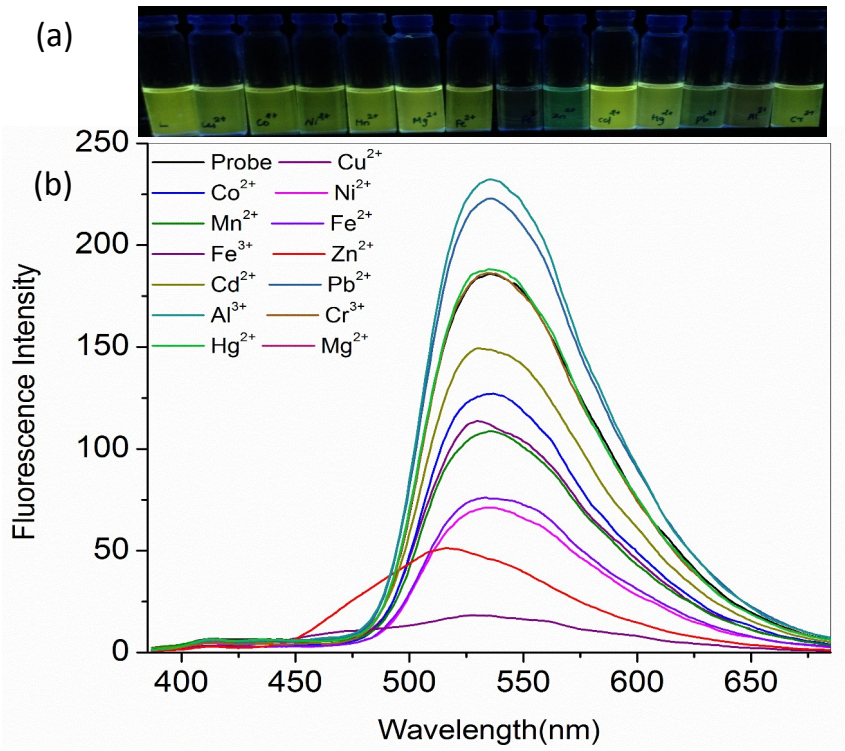

Fig. S5. (a) Image of the fluorescence vials of **NPY** (2mL, 5×10^{-5}M, DMSO) with different metal ions under UV-lamp λ_{exc} =375 nm and the corresponding fluorescence spectra of **NPY** (2mL, 5×10^{-5}M, DMSO) upon the addition of Zn^{2+} ions and other alkali, alkaline and transition metal ions (50μl, 1×10^{-3}M, H_2O).

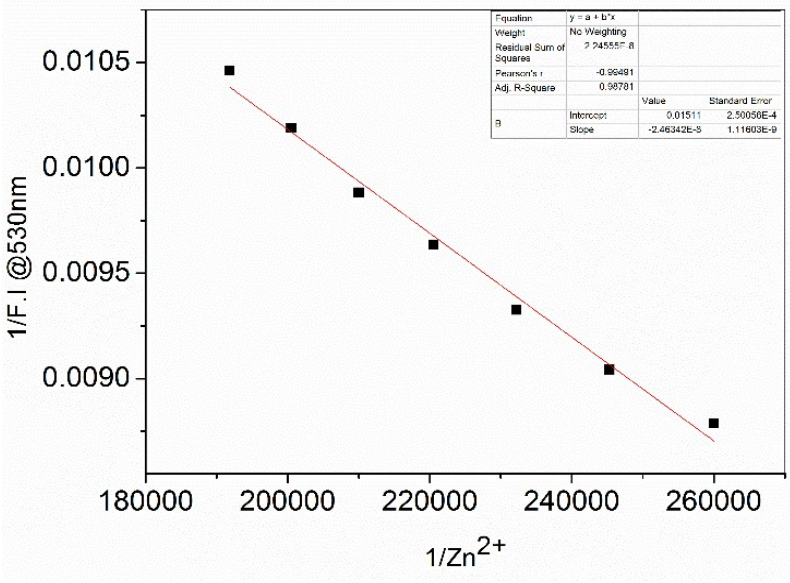

Fig. S6. Benesi-Hildebrand expression fitting of fluorescence curve of **NPY** in the presence of Zn^{2+}.

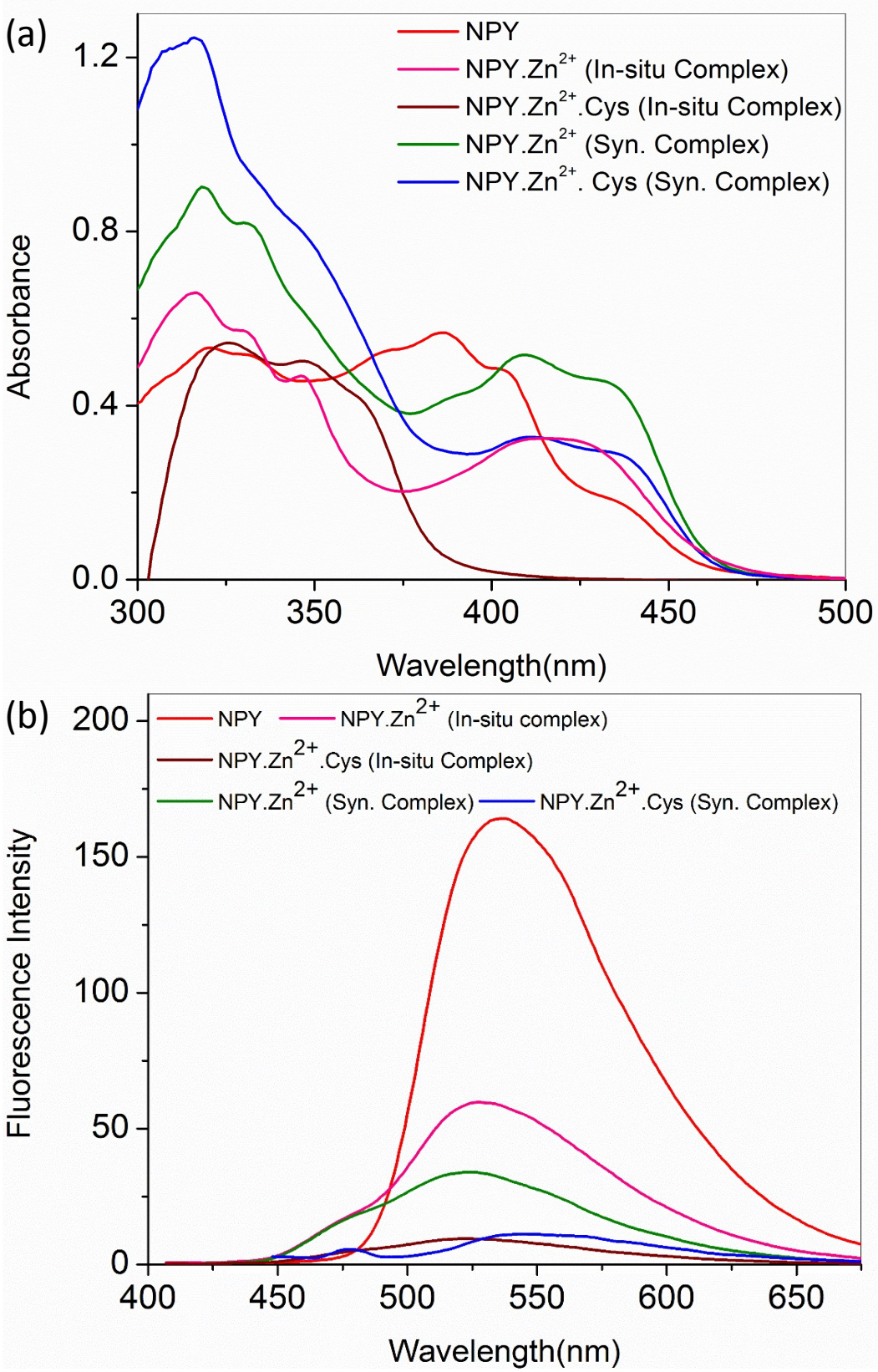

Fig. S7. UV-visible (a) and fluorescence (b) spectra of the *in-situ* prepared **NPY**.Zn^{2+} and **NPY**.Zn^{2+}.Cys complexes, and their corresponding synthesized complexes (Syn. Complex).

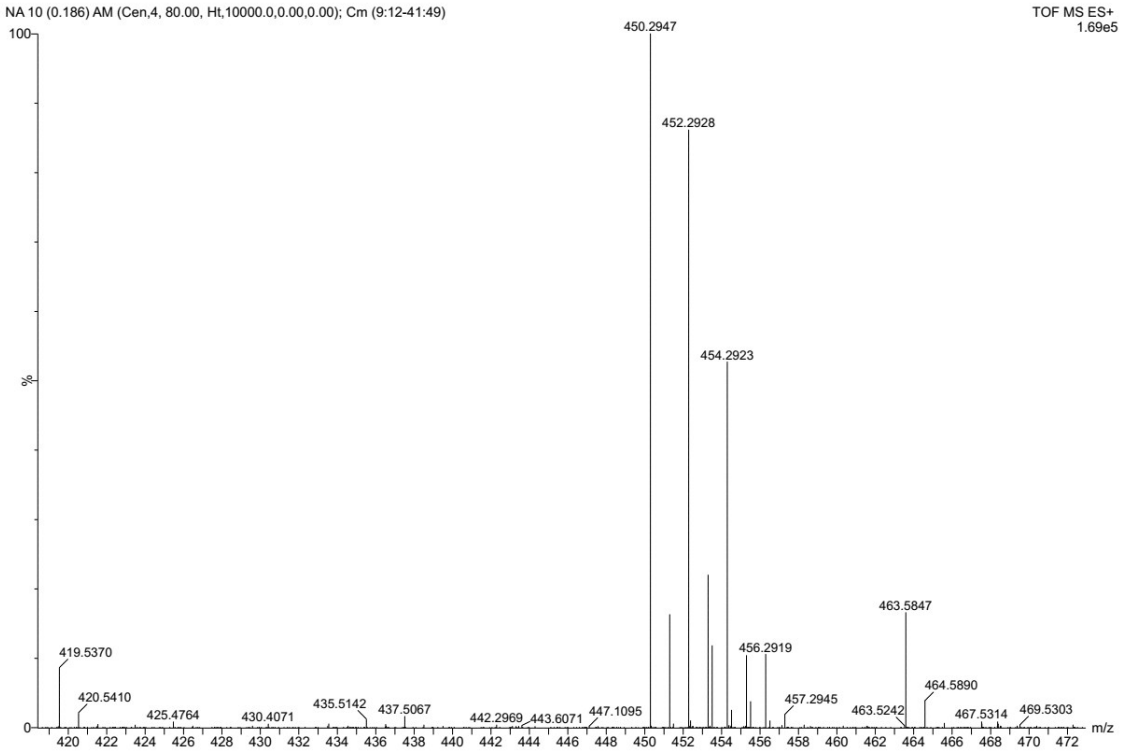

Fig. S8. HRMS spectrum of synthesized **NPY**.Zn^{2+} complex.

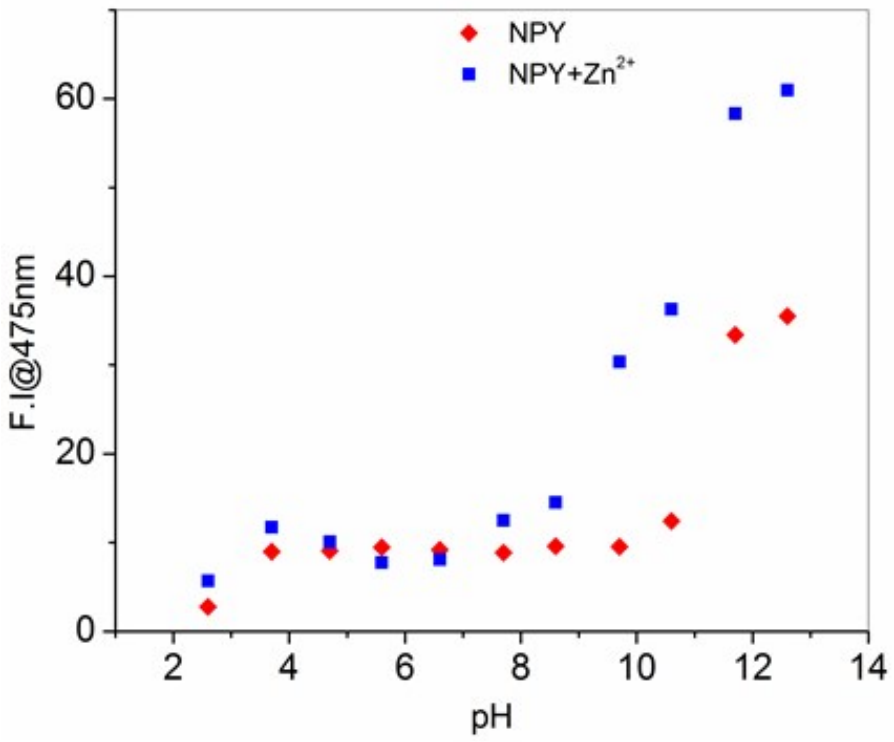

Fig. S9. pH effect on the fluorescence intensity at 475 nm of the solution of **NPY** in absence and presence of Zn^{2+} ion.

Fig. S10. Colour change of **NPY** (2 mL, 5×10^{-5} M, DMSO) upon the addition of Zn^{2+} ions (50 μL, 1×10^{-3} M, H_2O).

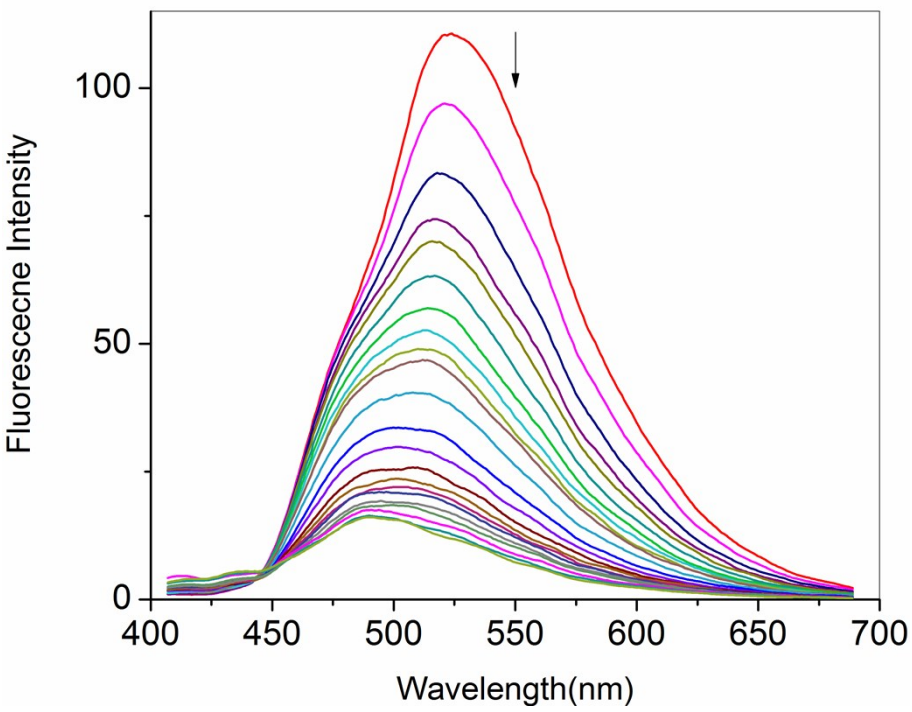

Fig. S11. Fluorescence (λ_{exc} = 375 nm) spectral changes of **NPY**.Zn^{2+} complex (2 mL, 5×10^{-5} M, DMSO) upon incremental addition of Cys (4 μL, 1×10^{-4} M, H_2O).

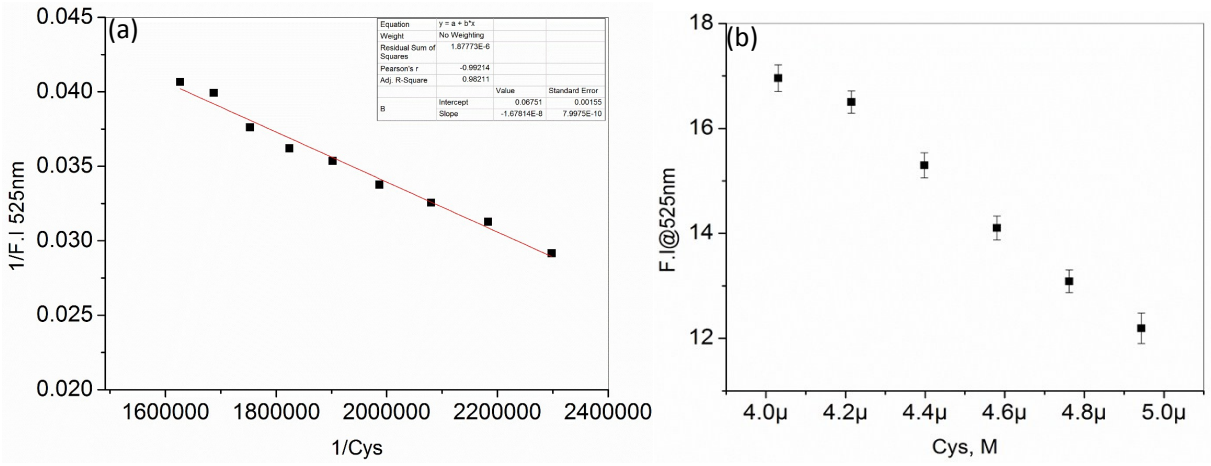

Fig. S12. (a). B-H plot of fluorescence curve of **NPY**.Zn^{2+} complex in the presence of Cys. (b) Plot of fluorescence intensity of **NPY**.Zn^{2+} complex against [Cys]**.**

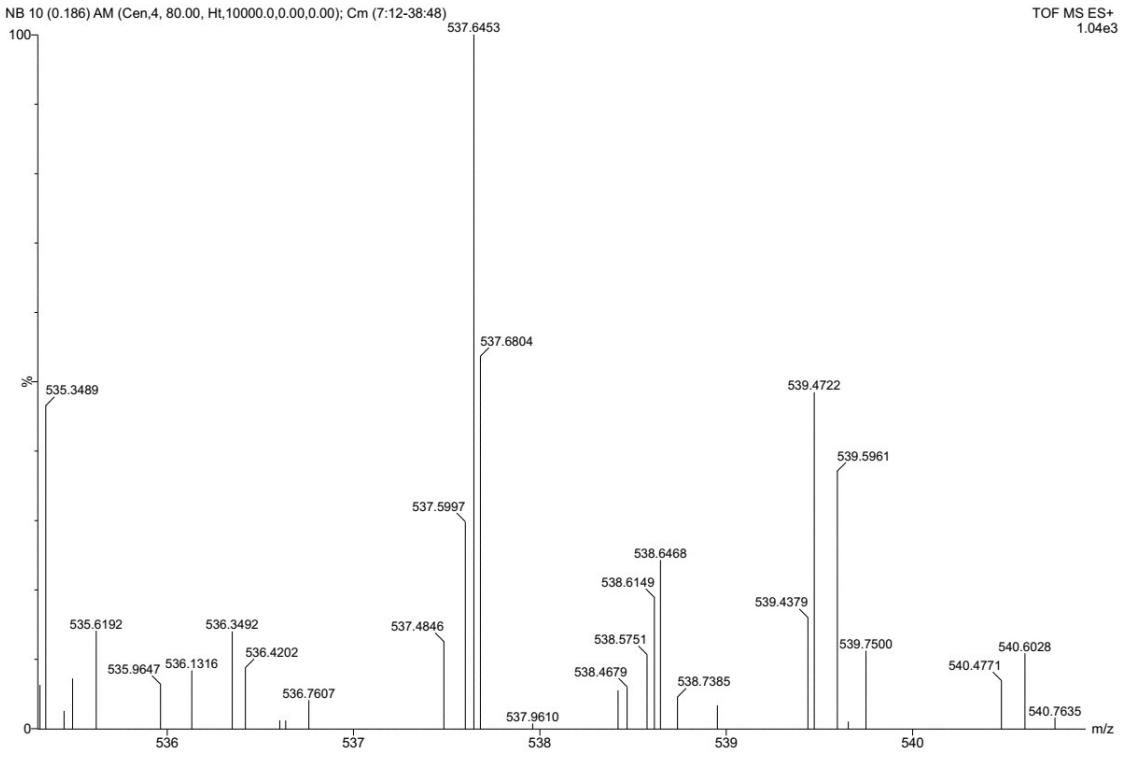

Fig. S13. HRMS spectrum of the **NPY**.Zn^{2+}.Cys complex.

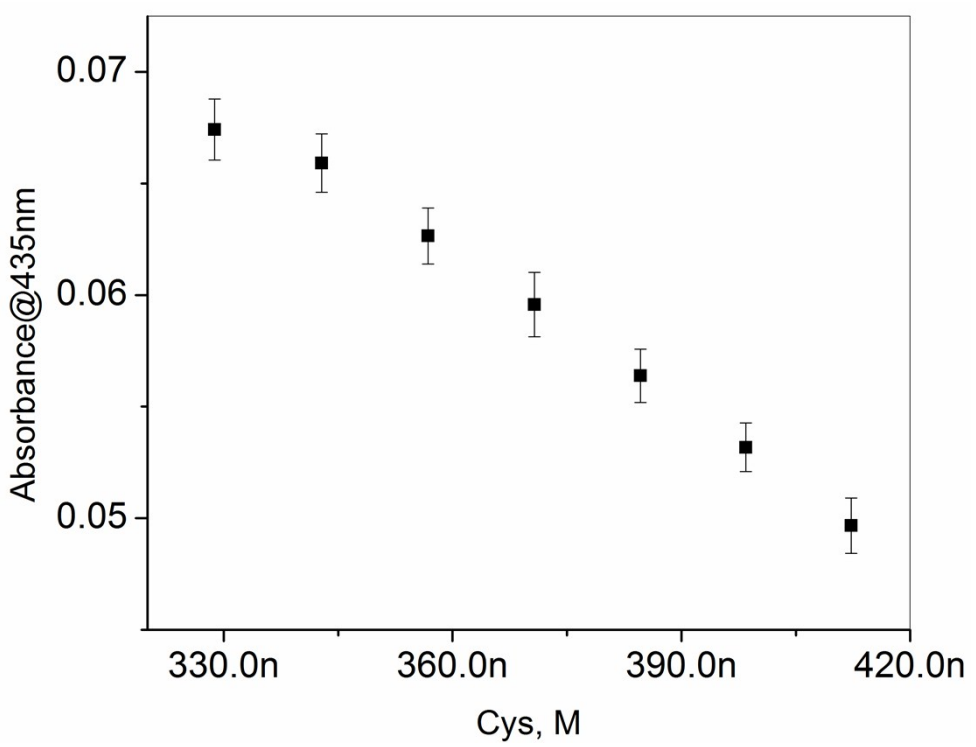

Fig. S14. Linear fit analysis for calculating the detection limit of Cys by using the UV-Vis titration data.

Table S1. Comparison table of some earlier reported works of Zn^{2+} ion

Systems	**Solvent Systems**	**Analytes**	**Detection limit**	**Applications**	**Ref**
Naphthaldehyde-Schiff base	MeOH-buffer	Zn^{2+}- turn off	10 μM	-	1
Pyridyl thioether Schiff base	Methanol	Zn^{2+}-Turn-on	0.078μM	-	2
Pyridineamine schiff base	HEPES buffer	Zn^{2+}-turn on	1.91×10^{-6} M	-	3
Coumarin Schiff base	DMF:H_2O	Zn^{2+}- Turn on	2.59×10^{-6} M	-	4
Naphthyl hydrazide conjugate	THF:H_2O	Zn^{2+} Colorimetry Al^{3+}Fluorescence	3.1 nM 0.92 nM	Intracellular Imaging	5
Vanillin Schiff base	DMSO:H_2O	Zn^{2+}-Turn On	0.018 μM	Live cell imaging	6
Triazole Schiff base	DMSO:H_2O	Zn^{2+} -Turn on	4.2×10^{-7} M	Live cell imaging	7
Trian Schiff base	EtOH:H_2O	Zn^{2+}- Turn on	4.89×10^{-8}M		8
Naphthyl hydrazide with pyridoxal	**DMSO:H_2O**	**Zn^{2+} and Cysteine**	**8.73×10^{-7} M and 6.63×10^{-7} M**	**Live cell imaging**	**This work**

Table S2. Comparison of various reported official methods for Zn^{2+} detection.

S.No	**Methods**	**LOD**	**Ref**
1	Potentiometry	0.0005 M	9
2	Stripping voltammetry	0.9 μgL^{-1}	10
3	FAAS	0.05 μgL^{-1}	11
4	ICP-MS	0.20 μgL^{-1}	12
5	AAS	0.35 μgL^{-1}	13

6	IC-ICP-AES	0.07 ng/g	14
7	Colorimetry	1.15×10^{-7} M	15

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