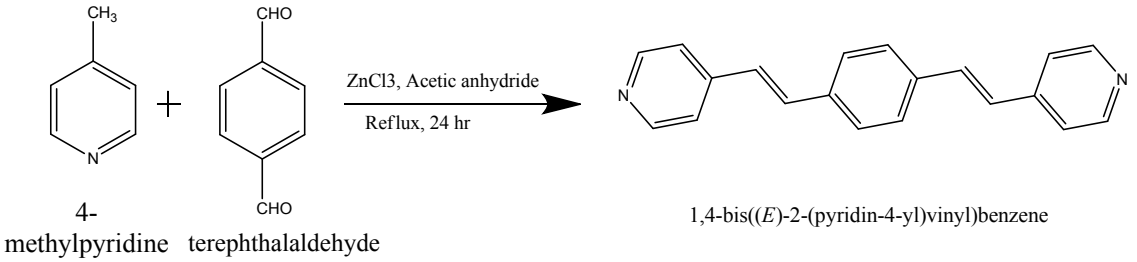
Supporting information for

A Family of Luminescent Metal-Organic Frameworks: Synthesis, Structural, and Sensing Studies

Synthesis of BPEB ligand [$C_{20}N_2H_{20}$]: Powdered anhydrous zinc chloride (13.64 g, 100.06 mmol) was added to a solution of 4-methylpyridine (13.7 g,147.1mmol) and Terephthalaldehyde (6.7g,50mmol) in 40 ml of acetic anhydride, and the mixture was heated for 24 h under reflux, cooled to 70°C, and filtered. The precipitate was washed with acetic anhydride and ethanol to obtain 11 g of the crude product which was recrystallized from pyridine. Yield 6.6 g (46%), yellowish powder.



4-methylpyridine terephthalaldehyde

1,4-bis((*E*)-2-(pyridin-4-yl)vinyl)benzene

Scheme 1: Synthesis of BPEB ligand

Table S1:
Selected bond lengths (Å) and bond angles (deg)

1	**2**		**3**		
Co1-O1	2.0246	Zn1-O1	2.016(8)	Co2-O9	1.944(0)
Co1-O5	2.0352	Zn1-O2	2.031(2)	Co2-O2	1.981(4)
Co1-O3	2.0392	Zn1-O2	2.0426	Co2-O6	2.003
Co1-N1	2.05393	Zn1-O3	2.0451	Co2-N1	2.037(4)
Co1-O2	2.1022	Zn1-O4	2.0733	Co2-O7	2.432(4)
				Co1-O1	2.005(1)
O1-Co1-O5	91.61(1)	N1-Zn1-O4	100.14(4)	Co1-O10	2.037(4)
O1-Co1-O3	89.16(8)	N1-Zn1-O1	104.04(8)	Co1-O5	2.074(4)
O1-Co1-N1	104.44(6)	N1-Zn1-O3	100.01(5)	Co1-N2	2.111(9)
O1-Co1-O2	163.55(9)	N1-Zn1-O2	96.35(1)	Co1-O4	2.206(1)
O5-Co1-O3	164.19(2)	O4-Zn1-O1	90.24(0)	Co1-O6	2.396(0)
O5-Co1-N1	97.37(0)	O4-Zn1-O3	159.67(7)	Co1-C34	2.479(5)
O5-Co1-O2	87.49(1)	O4-Zn1-O2	87.53(0)	O9-Co2-O2	87.49(1)
O3-Co1-N1	97.72(1)	O1-Zn1-O3	87.36(6)	O9-Co2-O6	97.72(1)
O3-Co1-O2	87.32(0)	O1-Zn1-O2	159.55(1)	O9-Co2-N1	87.32(0)
N1-Co1-O2	91.94(4)	O3-Zn1-O2	87.71(3)	O9-Co2-O7	91.94(4)
N1-Co1-O3	86.2(1)			O2-Co2-O6	86.2(1)
N1-Co1-O4	86.61(9)			O2-Co1-N1	85.67(8)
N1-Co1-N4	177.5(1)			O2-Co2-O7	58.39(8)
				O6-Co2-N1	
				O6-Co2-O7	
				N1-Co2-O7	
				O1-Co1-O10	10.3.15(0)
				O1-Co1-O5	161.76(6)
				O1-Co1-N2	88.56(4)
				O1-Co1-O4	101.96(9)
				O1-Co1-O6	82.93(5)
				O1-Co1-C34	131.90(3)

	O10-Co1-O5	93.58(8)
	O10-Co1-N2	92.73(7)
	O10-Co1-O4	154.85(3)
	O10-Co1-O6	95.84(0)
	O10-Co1-C34	124.50(7)
	O5-Co1-N2	97.92(5)
	O5-Co1-O4	61.35(2)
	O5-Co1-O6	88.27(4)
	O5-Co1-C34	30.92(2)
	N2-Co1-O4	89.04(2)
	N2-Co1-O6	169.09(0)
	N2-Co1-C34	94.74(9)
	O4-Co1-O6	86.06(0)
	O4-Co1-C34	30.44(7)
	O6-Co1-C34	85.94(2)

Table S2: MOFs reported by using *bpeb* is one of the linkers.

Compound	Photoluminescence study	Thermal stability
{[Co(*bpeb*)(hfipb*b*)$_{0.5}$]}$_n$*[LCo-1]*	340 nm on $_{ex}$ at 391-392 nm.	295˚C
{[Zn(bpeb)$_2$(hfipb*b*)]}$_n$*[LZn-1]*	340 nm on $_{ex}$ at 391-392 nm.	295˚C
{[Co(bpeb) $_2$(o*ba*)]}$_n$*[LCo-2]*	391 nm on $_{ex}$ at 411nm.	375˚C

bpeb= [1,4-bis[2-(4-pyridyl) ethynyl] benzene,*hfipbb* = 4,4^1(Hexafluoroisopropylidene) bis (benzoic acid) and *oba* = 4,4^{1}Oxybis(benzoic acid).

Fluorescence experiments: In the typical experimental setup, 1 mg of each compound was dispersed in 1 ml of MeOH. In a 1 cm quartz cuvette, 3 mL solution of each compound in

MeOH was placed and the fluorescence response upon excitation at 350 nm was measured in-situ after incremental addition of freshly prepared analyte solutions in the range of 365-600 nm while keeping 2 nm slit width for both source and detector. To maintain homogeneity, the solution was stirred at a constant rate during the experiment.

The formula for calculating the percentage of Picric acid fluorescence intensity quenching:

(Io-I)/Io x 100%

Where Io = initial fluorescence intensity,

I = intensity of 1 containing PA solution.

Reference: (a) S. Pramanik, C. Zheng, X. Zhang, T. J. Emge, and J. Li, J. Am. Chem. Soc., 2011, **133**, 4153; (b) D. Banerjee, Z. Hu and J. Li, Dalton Trans., 2014, **43**, 10668.

Stern-Volmer equation:

$$I_0/I = KSV[A] + 1$$

Where I_0 = fluorescent intensity of 1 before the addition of the analyte

I = fluorescent intensity after the addition of the respective analyte

KSV = Stern-Volmer constant

[A] = molar concentration of the analyte (M-1).

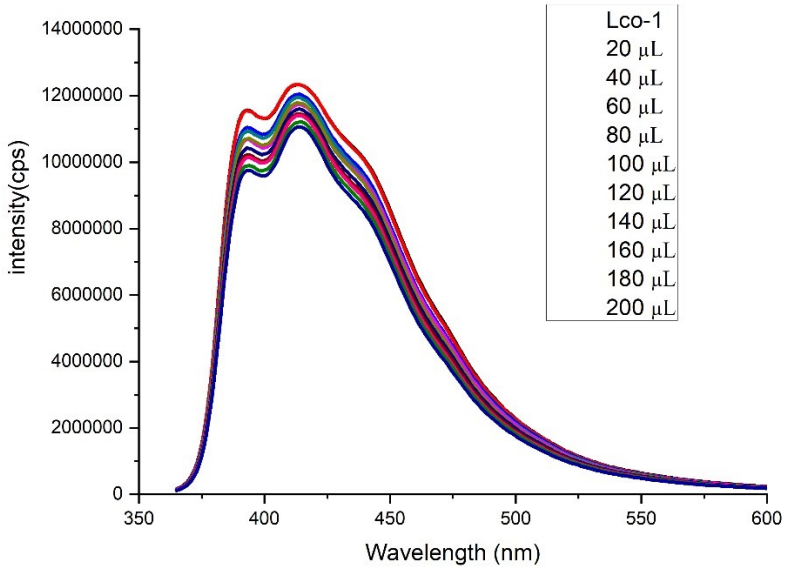


Figure S1: The change in fluorescence intensity of compound 1 upon incremental addition of 1,2-DNB(1mM) solution in DMF

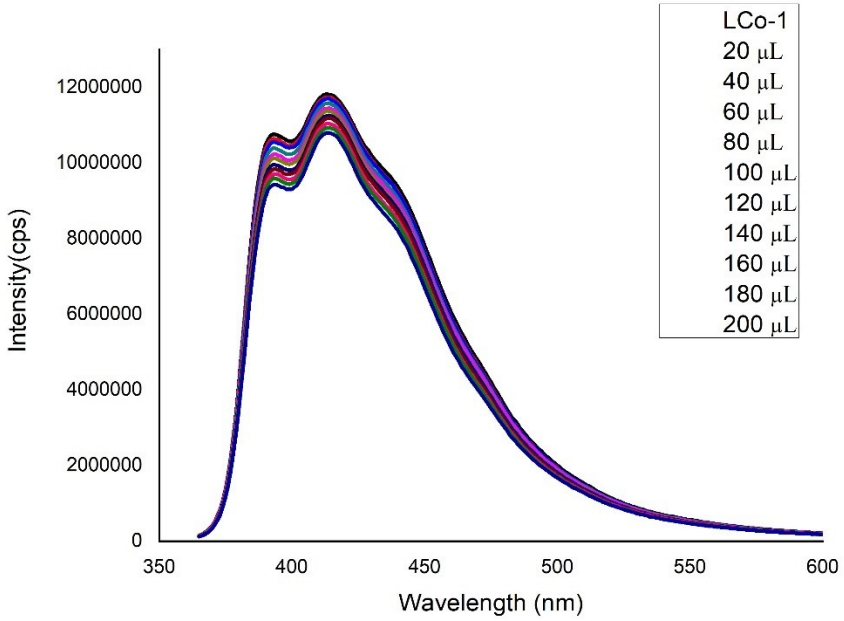


Figure S2: The change in fluorescence intensity of compound 1 upon incremental addition of 1,3-DNB(1mM) solution in DMF

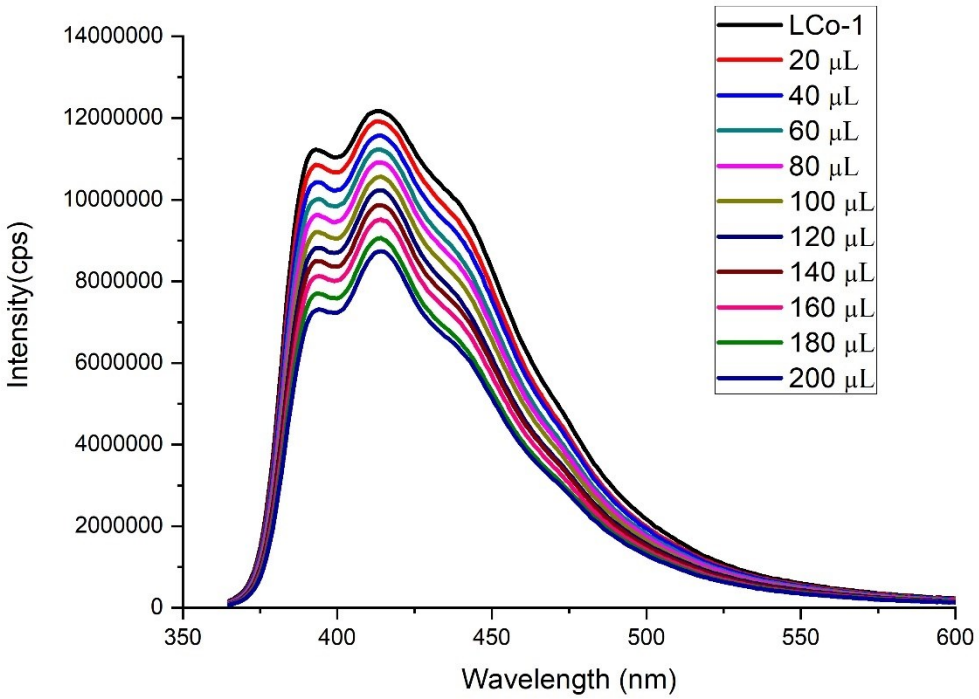


Figure S3: The change in fluorescence intensity of compound 1 upon incremental addition of CDNB(1mM) solution in DMF

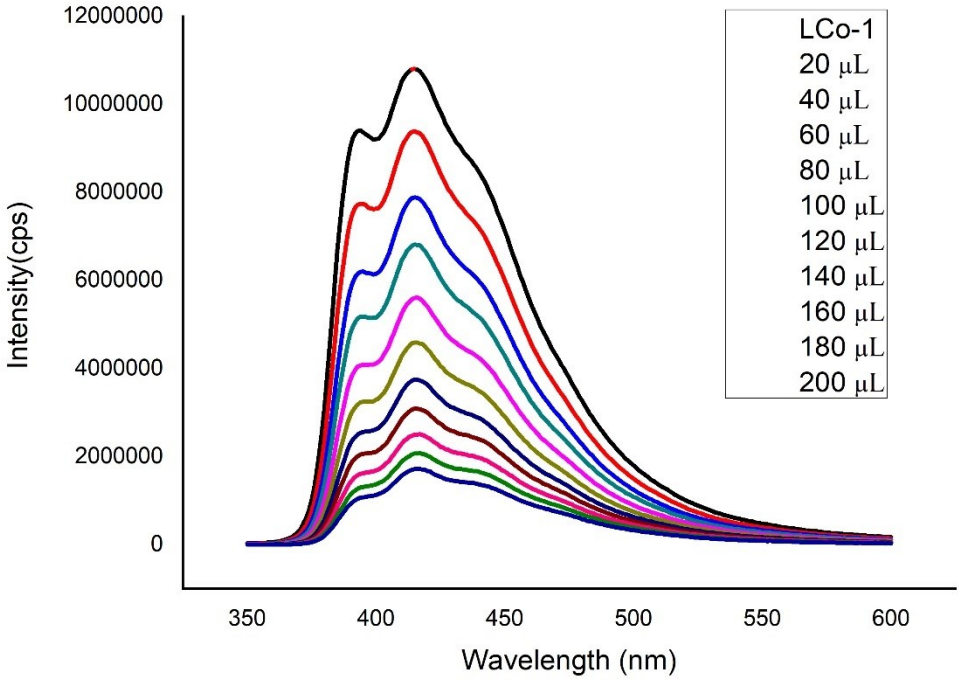


Figure S4: The change in fluorescence intensity of compound 1 upon incremental addition of 2,4-DNPH (1mM) solution in DMF

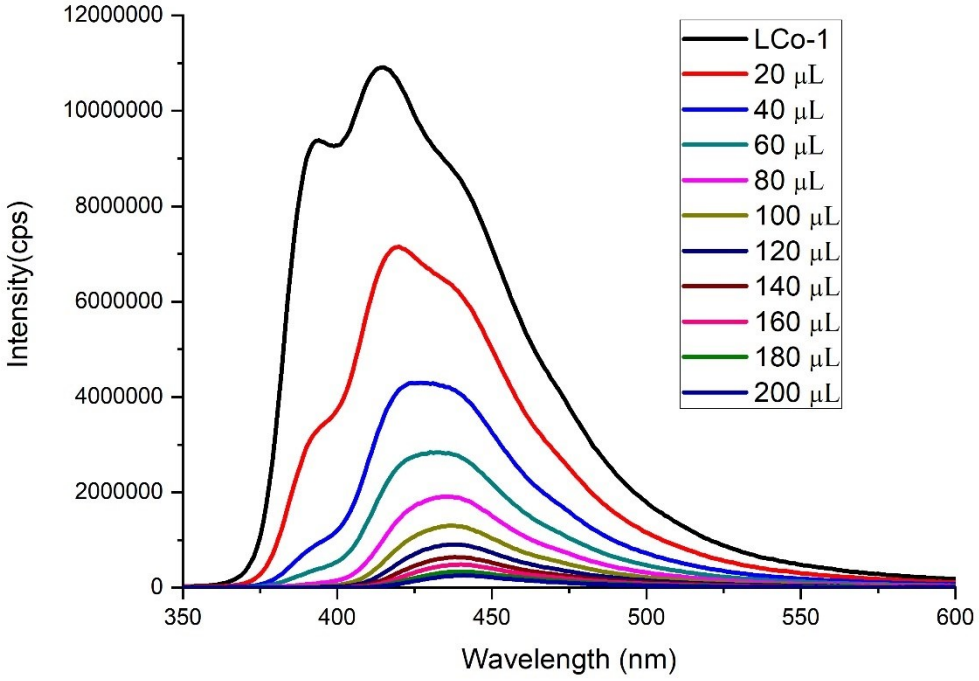


Figure S5: The change in fluorescence intensity of compound 1 upon incremental addition of 4-NA (1mM) solution in DMF

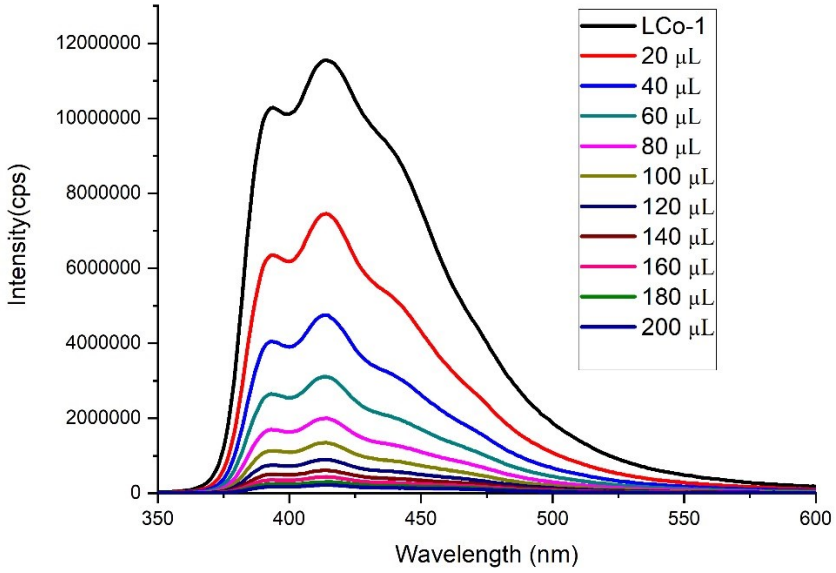


Figure S6: The change in fluorescence intensity of compound 1 upon incremental addition of 1-NP (1mM) solution in DMF

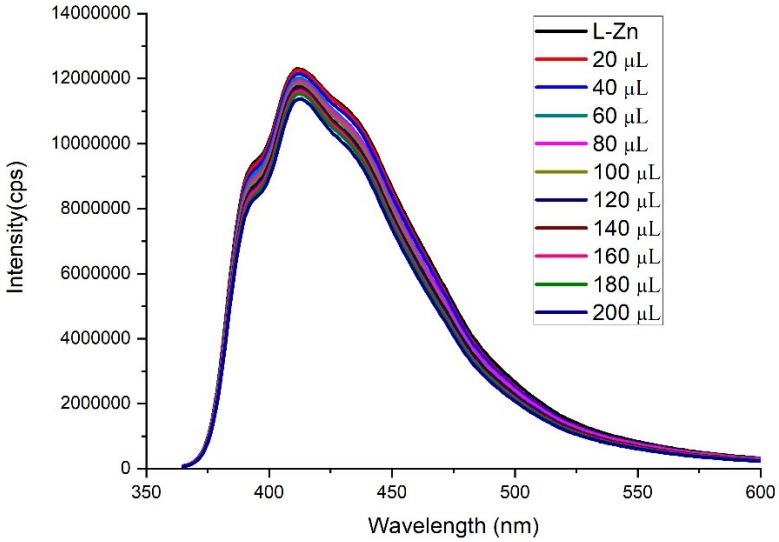


Figure S7: The change in fluorescence intensity of compound 2 upon incremental addition of 1,2-DNB (1mM) solution in DMF

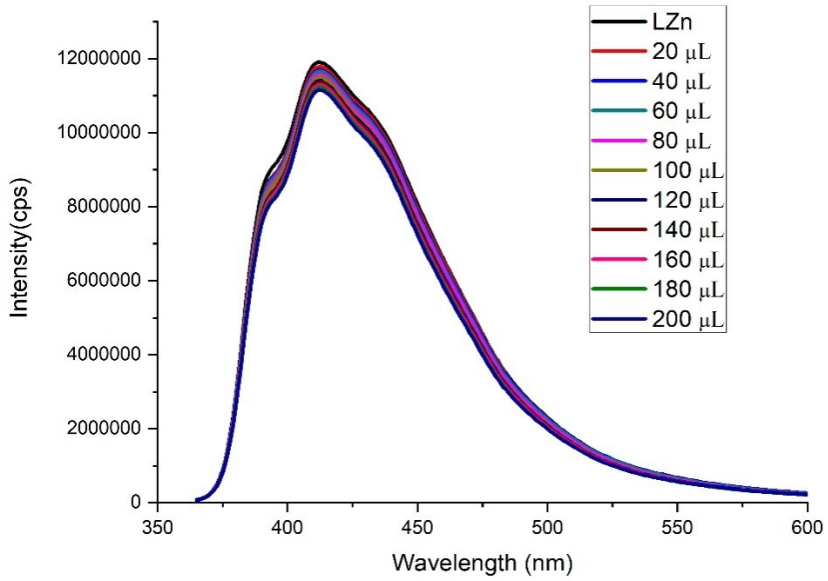


Figure S8: The change in fluorescence intensity of compound 2 upon incremental addition of 1,3-DNB (1mM) solution in DMF

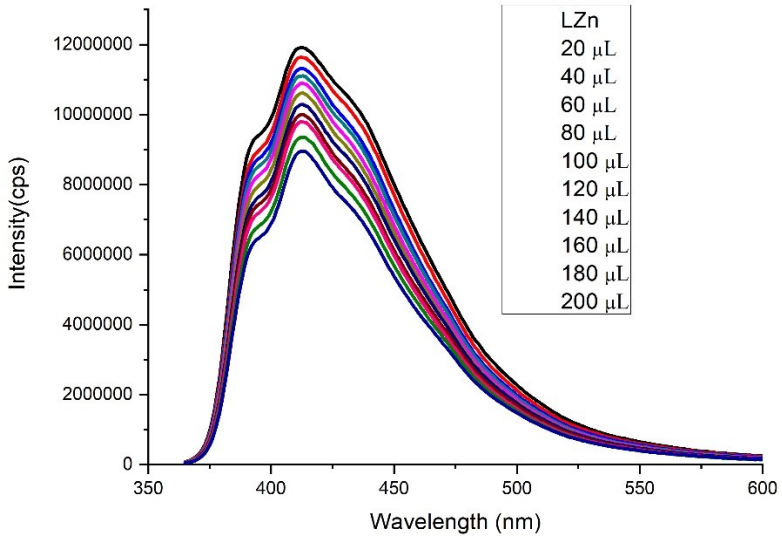


Figure S9: The change in fluorescence intensity of compound 2 upon incremental addition of CDNB (1mM) solution in DMF

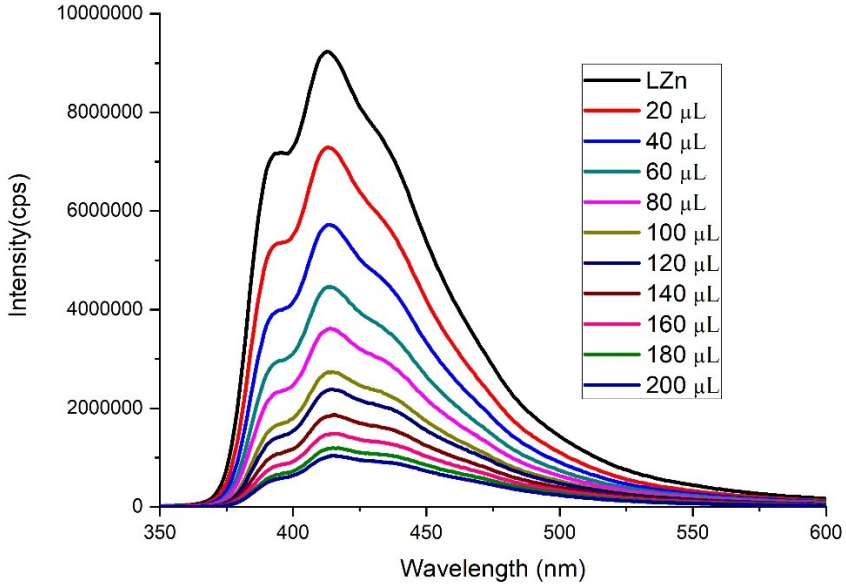


Figure S10: The change in fluorescence intensity of compound 2 upon incremental addition of 2,4-DNPH (1mM) solution in DMF

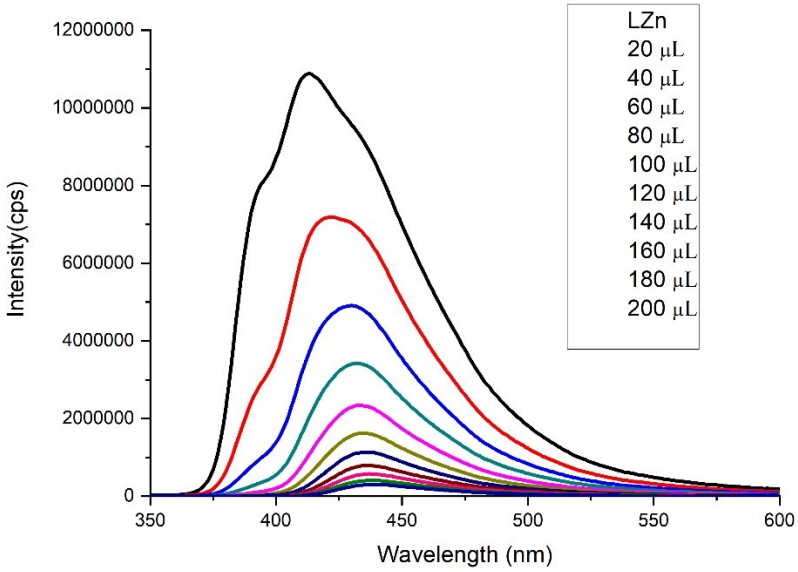


Figure S11: The change in fluorescence intensity of compound 2 upon incremental addition of 4-NA (1mM) solution in DMF

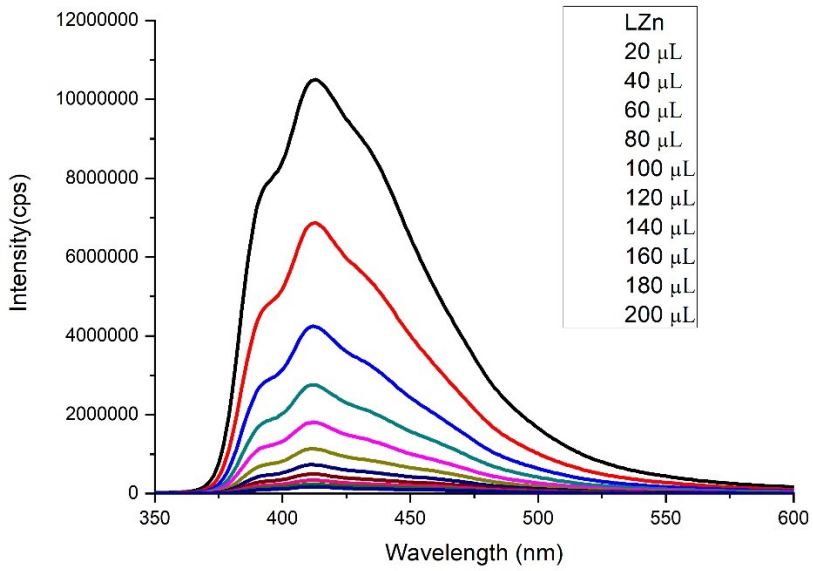


Figure S12: The change in fluorescence intensity of compound 2 upon incremental addition of 1-NP (1mM) solution in DMF

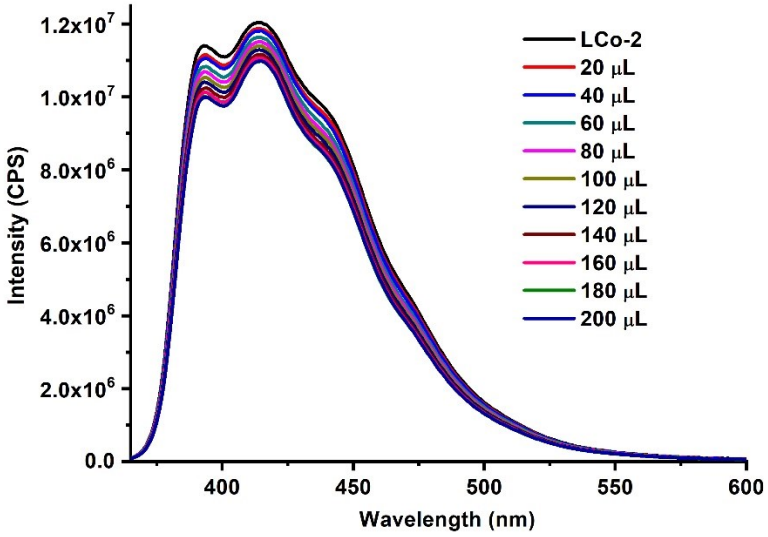


Figure S13: The change in fluorescence intensity of compound 3 upon incremental addition of 1,2-DNB (1mM) solution in DMF

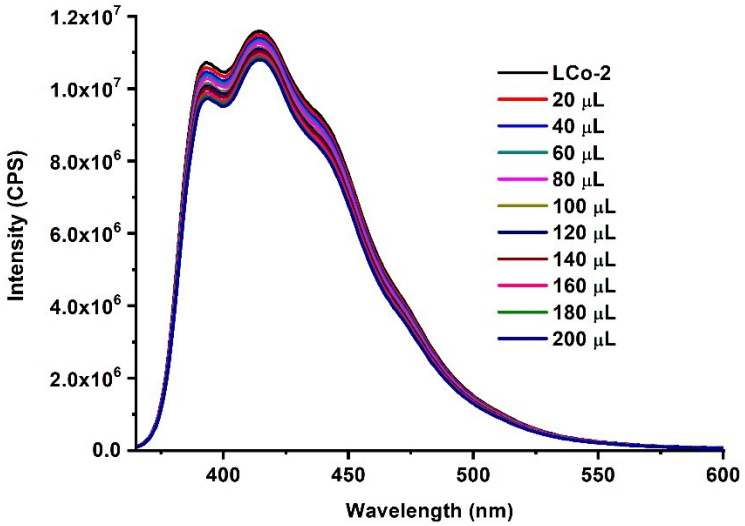


Figure S14: The change in fluorescence intensity of compound 3 upon incremental addition of 1,3-DNB (1mM) solution in DMF

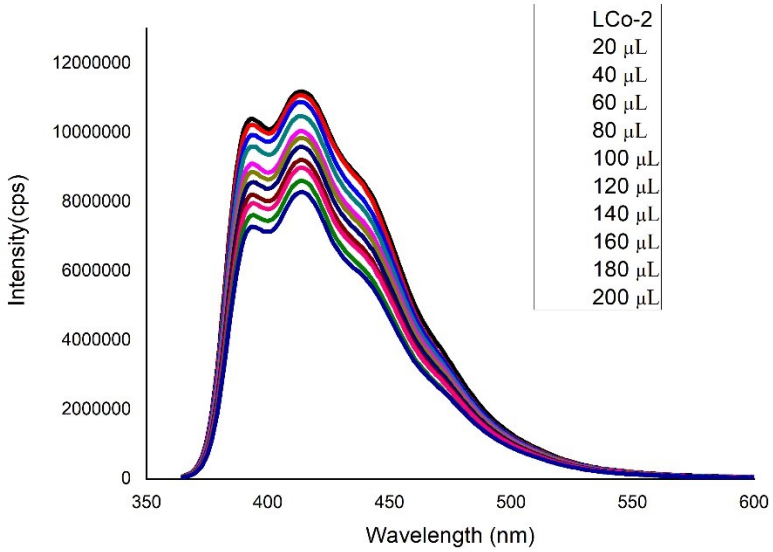


Figure S15: The change in fluorescence intensity of compound 3 upon incremental addition of CDNB (1mM) solution in DMF

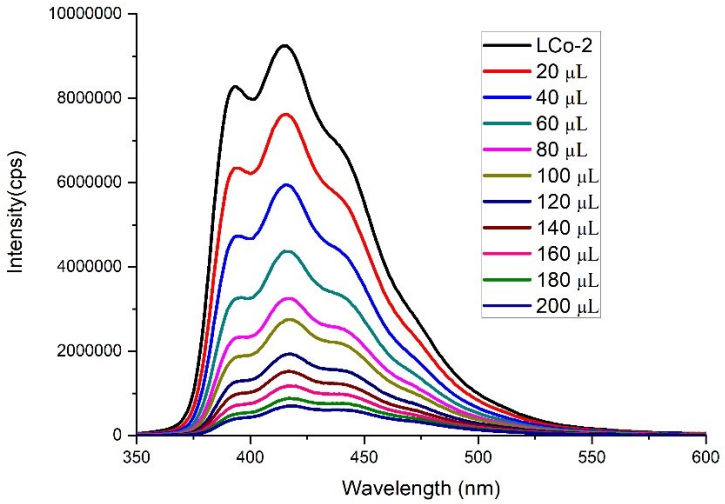


Figure S16: The change in fluorescence intensity of compound 3 upon incremental addition of 2,4-DNPH (1mM) solution in DMF

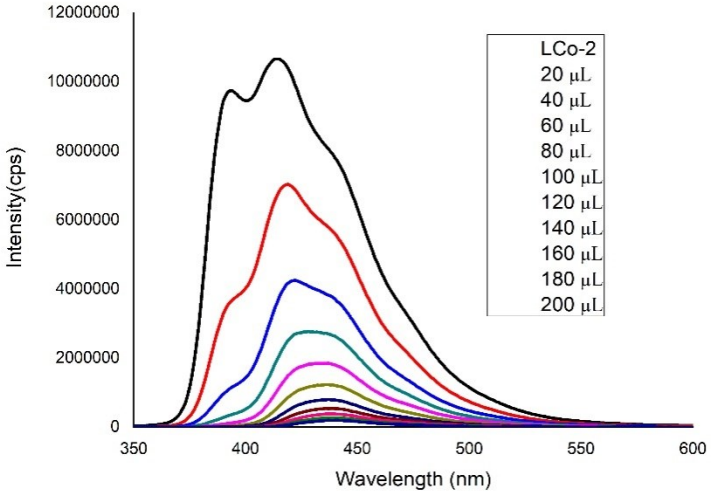


Figure S17: The change in fluorescence intensity of compound 3 upon incremental addition of 4-NA (1mM) solution in DMF

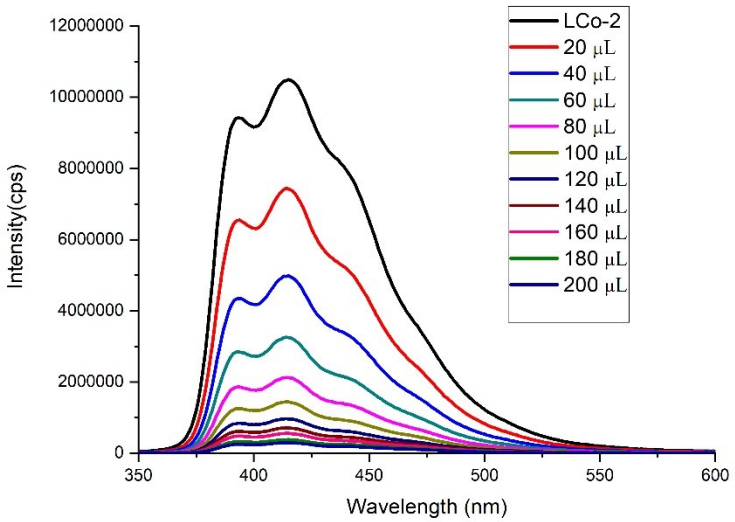


Figure S18: The change in fluorescence intensity of compound 3 upon incremental addition of 1-NP (1mM) solution in DMF