Supplementary material

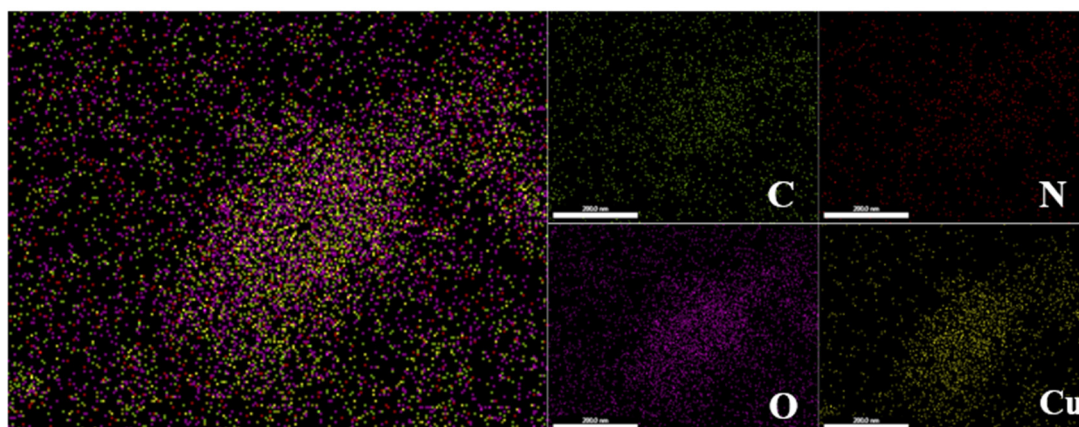**Figure S1.** TEM image of Cu-MOF.

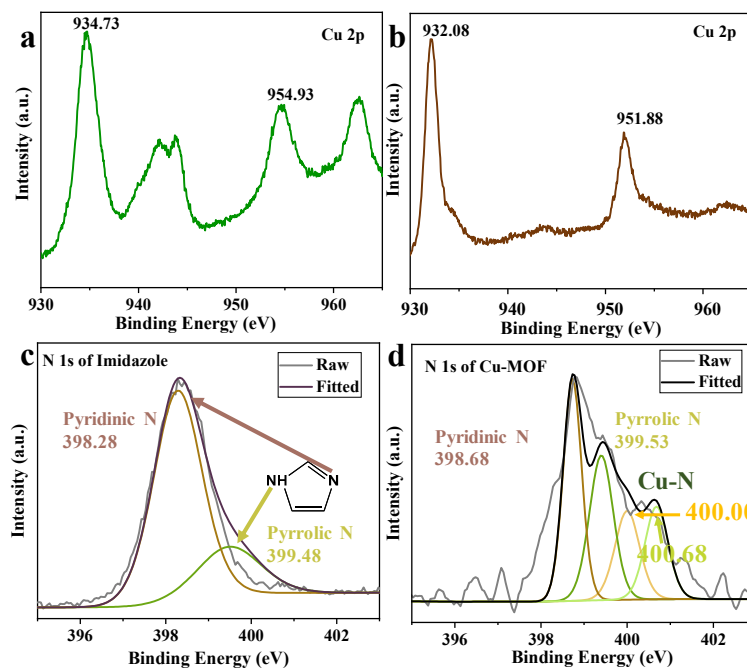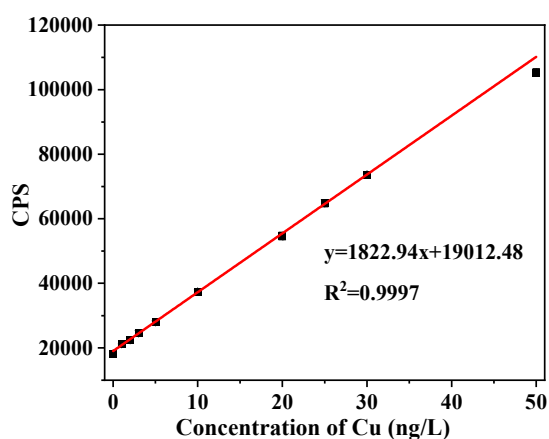**Figure S2.** EDS mapping spectra of Cu-MOF.

Figure S3. (a). Cu 2p XPS spectrum of CuCl$_2$·2H$_2$O. (b). Cu 2p XPS spectrum of Cu-MOF. (c). N 1s XPS spectrum of imidazole. (d). N 1s XPS spectrum of Cu-MOF.

Sample		Cu	Content
ng/L	CPS	ng/L	%
30	36511	9.599086	31.99695
75	63056	24.16076	32.21435
150	104092	46.6717	31.11447

Figure S4. The mass ratio of Cu-MOF detected by ICP-OES.

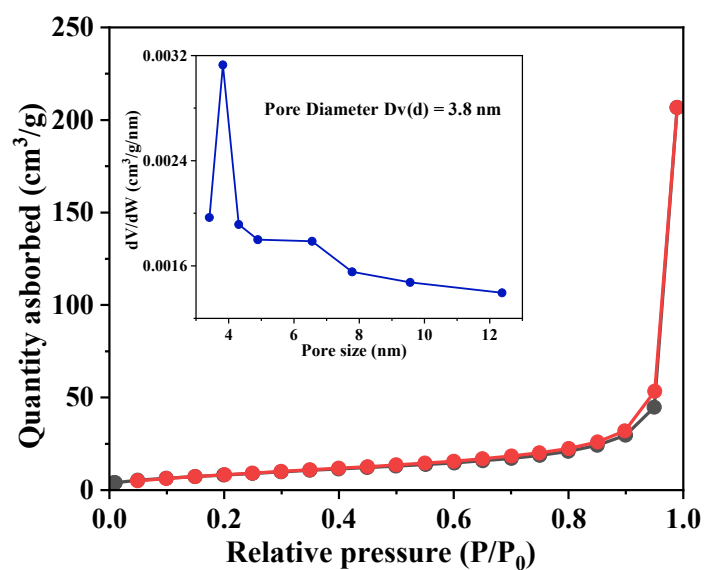**Figure S5.** N_2 sorption isotherms and pore size distribution curves of Cu-MOF.
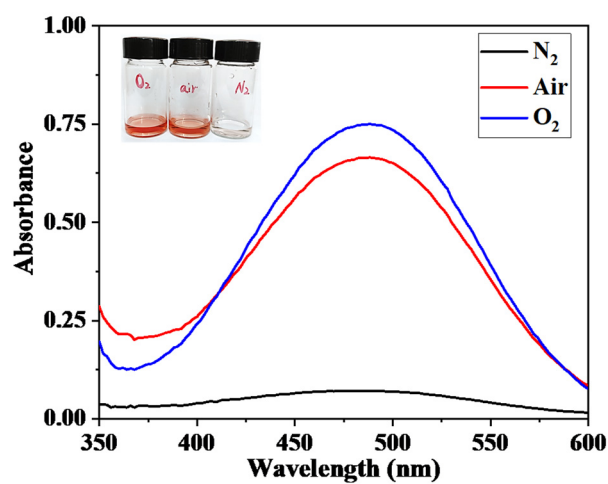

Figure S6. The catalytic activity of Cu-MOF under different gas atmospheres.
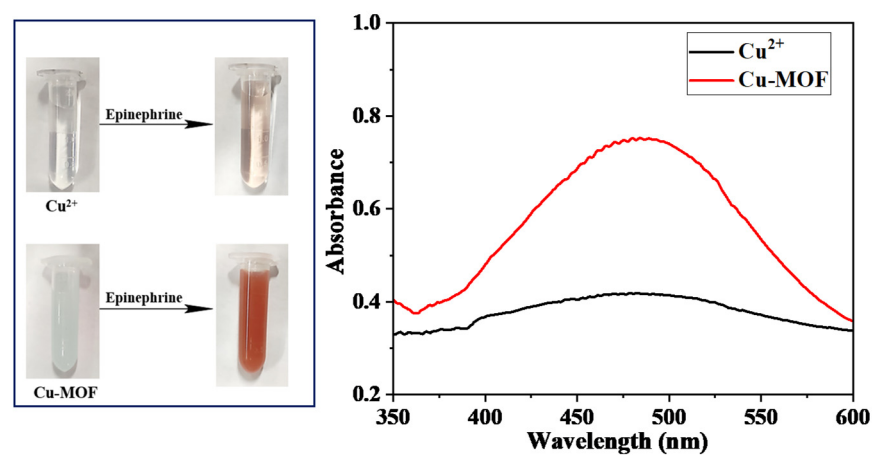

Figure S7. Comparison of catalytic performance of epinephrine between copper ions and Cu-MOF at the same concentration.
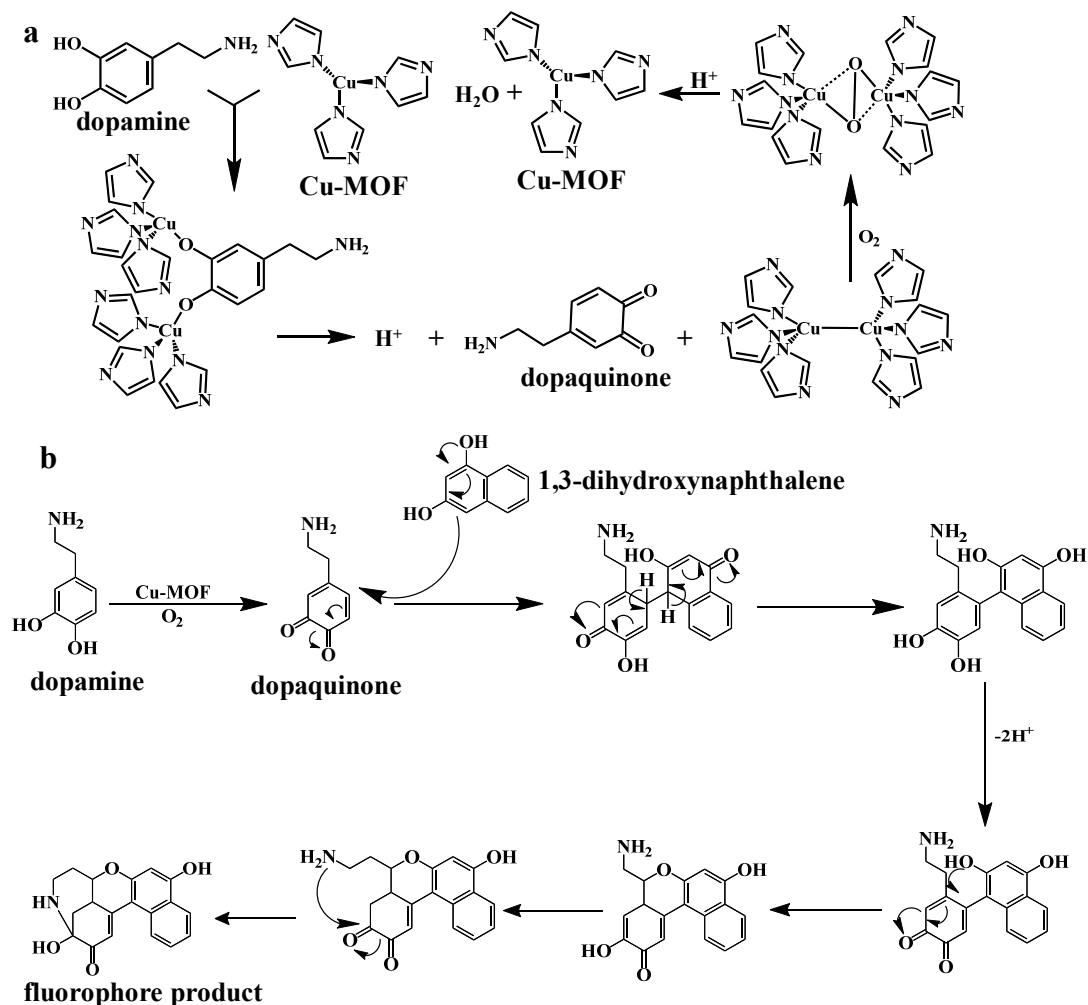
Figure S8. (a) The possible mechanism of the oxidation of dopamine to dopaquinone catalyzed by Cu-MOF, and (b) the formation of fluorescent products by intramolecular Michael addition of dopaquinone and 1,3-dihydroxynaphthalene.
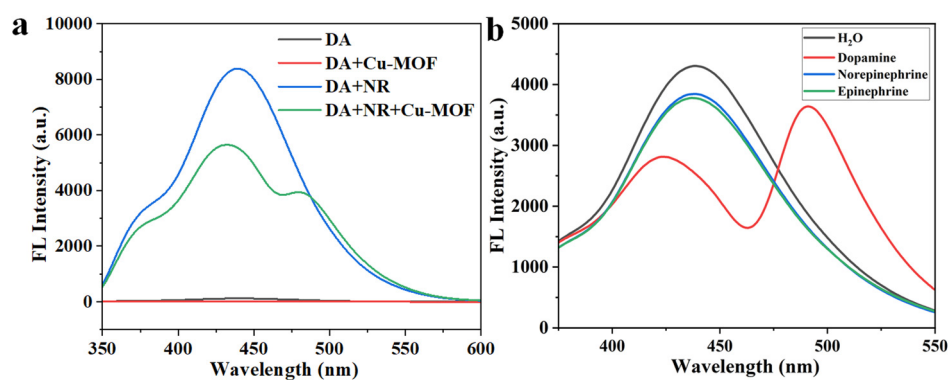

Figure S9. (a) Fluorescence spectra of DA, DA + Cu-MOF, DA + NR, and DA + NR + Cu-MOF; (b) Fluorescence response of Cu-MOF system towards different catecholamine neurotransmitters spectra. Color code: black (H₂O), red (Dopamine), blue (Norepinephrine) and green (Epinephrine).

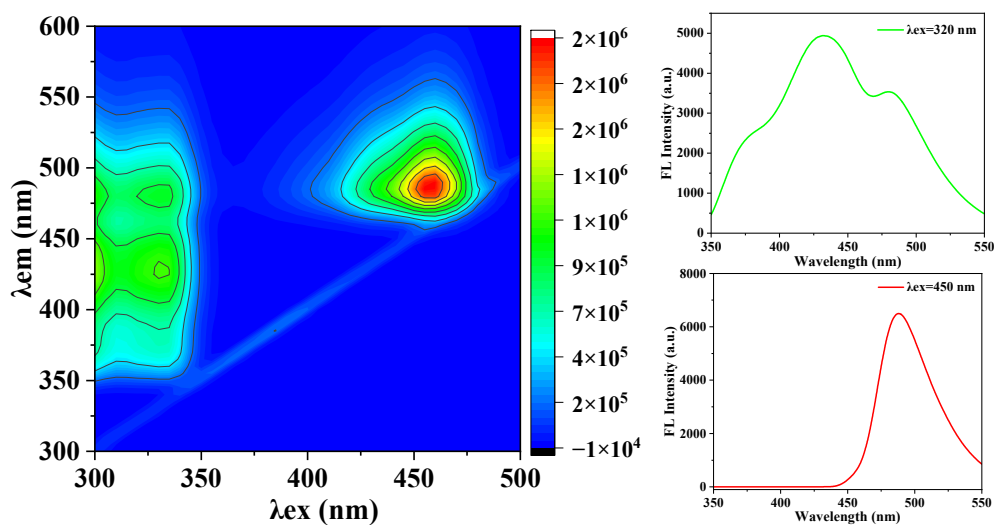**Figure S10.** 3D fluorescence scan of Cu-MOF+NR+DA system and corresponding fluorescence emission peak under 320 nm/450 nm excitation.
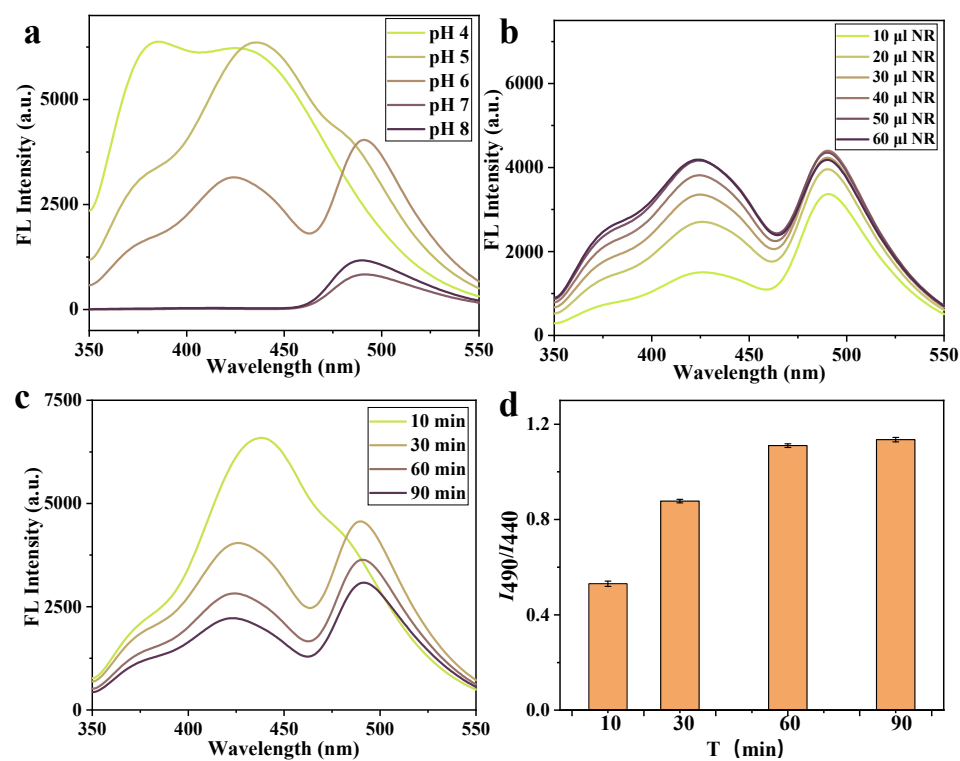

Figure S11. The fluorescent responses of Cu-MOF system to DA at different (a) pH values; (b) NR volume and (c) reaction time. (d) The I_{490}/I_{440} responses of Cu-MOF system to DA at different reaction times. All the error bars were calculated from three parallel experiments.
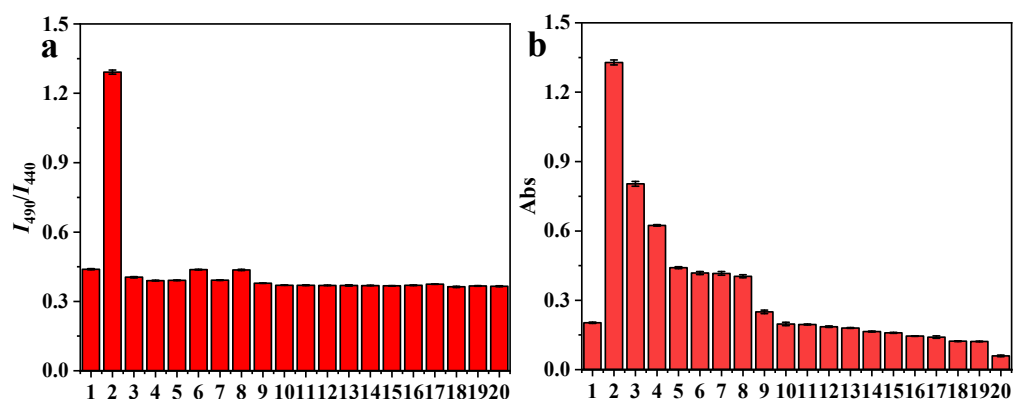
Figure S12. The selectivity of the Cu-MOF platform to DA and other possible interfering substances by fluorescent mode and colorimetric mode. Detection of species and concentrations: 1. Blank; 2. DA (20 μM); 3. uric acid (200 μM); 4. Na₂CO₃ (20 mM); 5. KCl (20 mM); 6. NaCl (20 mM); 7. epinephrine (20 μM); 8. norepinephrine (20 μM); 9. D-glucose (200 μM); 10. L-tryptophan (200 μM); 11. L-alanine (200 μM); 12. L-isoleucine (200 μM); 13. L-lysine (200 μM); 14. L-aspartic acid (200 μM); 15. L-glutamic acid (200 μM); 16. L-phenylalanine (200 μM); 17. ascorbic acid (200 μM); 18. Tannic acid (200 μM); 19. L-cysteine (200 μM); 20. GSH (200 μM). All the error bars were calculated from three parallel experiments.
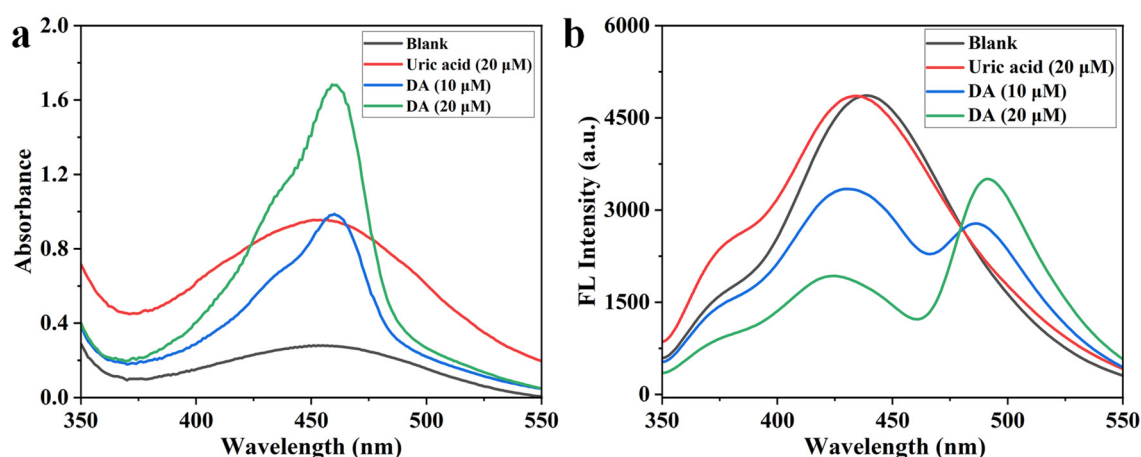

Figure S13. (a) Fluorescence spectra and (b) absorption spectra of the Cu-MOF sensing system with the addition of only uric acid, DA and DA + NR + Cu-MOF in aqueous solutions.

Table S1. DA Determination in Healthy Human Urine Samples by the Cu-MOF Platform through Three Modes [1].

DA (μM)	Fluorescent recovery (%)	RSD (%)	Colorimetric recovery (%)	RSD (%)	Smartphone recovery (%)	RSD (%)
5	100.67	0.62	101.15	0.49	106.61	3.34
10	102.35	0.73	99.23	1.13	97.30	1.66
15	104.87	0.53	95.28	2.36	103.33	1.06

[1] The means were calculated from three parallel experiments.

Table S2. DA Determination in dopamine hydrochloride injection sample by the Cu-MOF Platform through three modes [1].

Sample content (μM)	Mode	Measured content (μM)	RSD (%)
	Fluorescence	2.78	1.41
2.5	Colorimetry	2.45	5.48
	Smartphone	2.45	10.61

[1] The means were calculated from three parallel experiments.

Table S3. DA Determination in Human with High Uric Acid Urine Samples with High Level of Uric Acid by the Cu-MOF Platform through Three Modes [1].

MODE	The ratio of signal output before and after 200 μM of DA spiking		RSD (%)
	Normal urine	**Urine spiked with 200 μM of uric acid**	
Fluorescence	2.223	2.315	4.61
Colorimetry	4.545	1.771	138.73
Smartphone	1.265	1.328	3.15

[1] The means were calculated from three parallel experiments.