Electronic Supplementary Information

Capsulation of EBTAC into ZIF-8 for the development of a signal-on fluorescent biosensor to detect alkaline phosphatase

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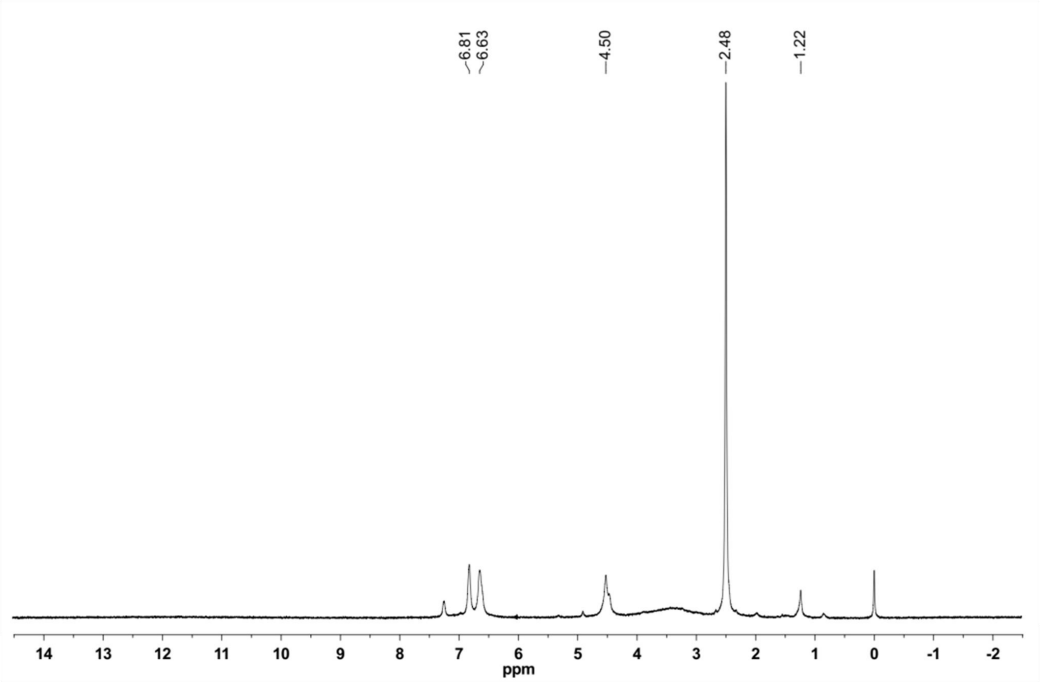

Fig. S1 ^{1}H NMR (Bruker Avance III 400 MHz, DMSO-*d*) of EBTAC: δ 6.3 (4H, CH_{py}), 6.81 (4H, CH_{py}), 4.50 (s, 8H, CH_2).

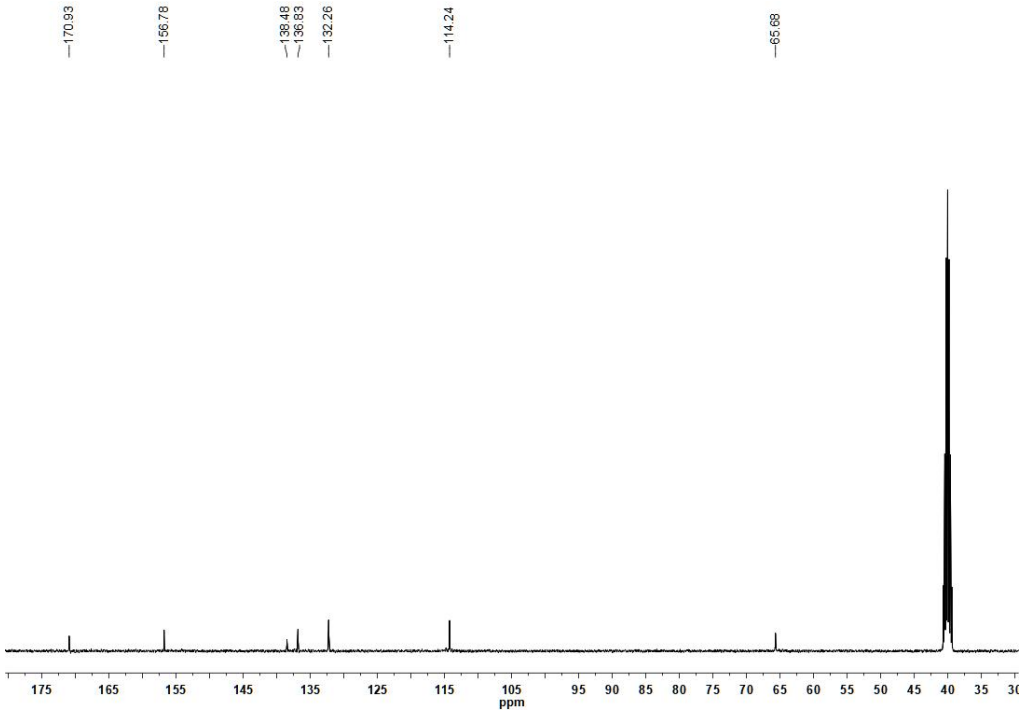

Fig. S2 ^{13}C NMR (Bruker Avance III 400 MHz, DMSO-*d*) of EBTAC: δ 170.9 (C=O), 156.8 (C_{py}), 138.5 (C=C), 136.8 (C_{py}), 132.3 (C_{py}), 114.2 (C_{py}), 63.7 (CH_2).

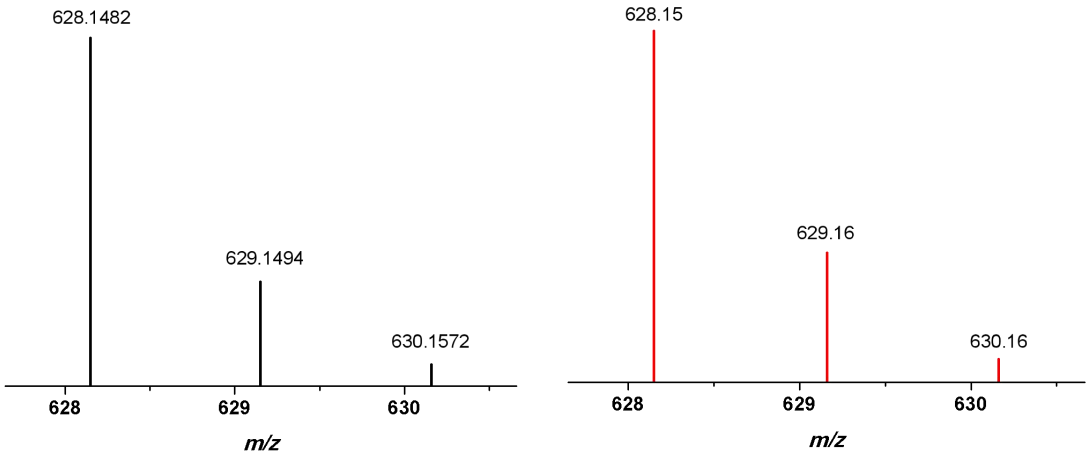

Fig. S3 The peak at m/z = 628.16 is ascribed to Chemical Formula: $C_{34}H_{28}O_{12}$, m/z: 628.16 (100.0%), 629.16 (36.8%), 630.16 (6.6%), 630.16 (2.5%) according to the analysis by ChemBioDraw). the simulated result fits well with the measured isotopic distribution pattern.

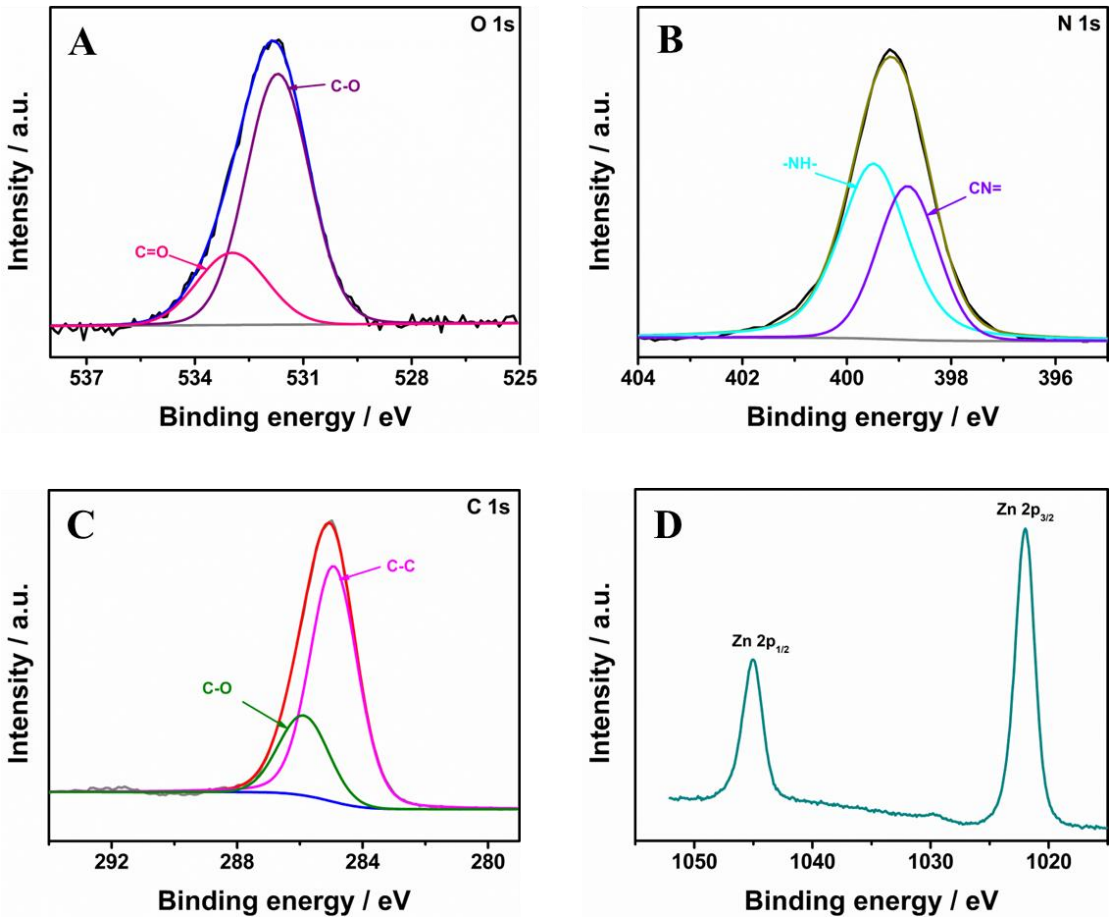

Fig. S4 The XPS spectra for O 1s, N 1s, C 1s and Zn 2p, respectively.

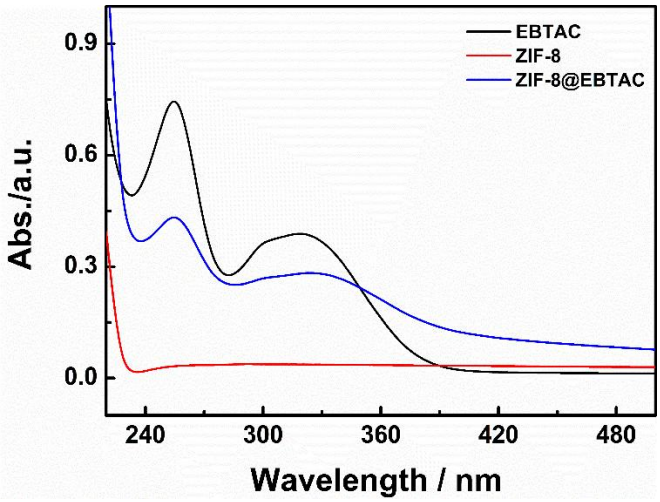

Fig. S5 Ultraviolet-visible absorption spectra of ZIF-8, EBTAC and ZIF-8@EBTAC.

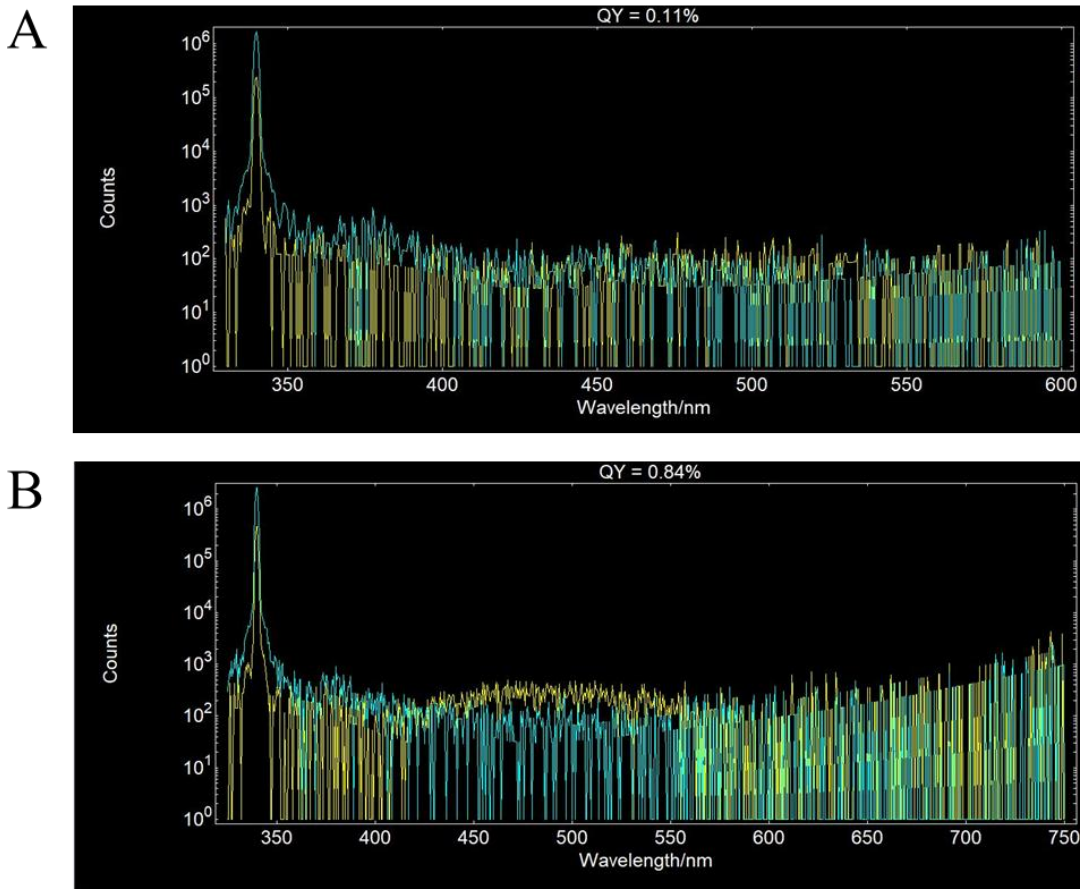

Fig. S6 The fluorescence quantum yield of EBTAC (A) and ZIF-8@EBTAC (B).

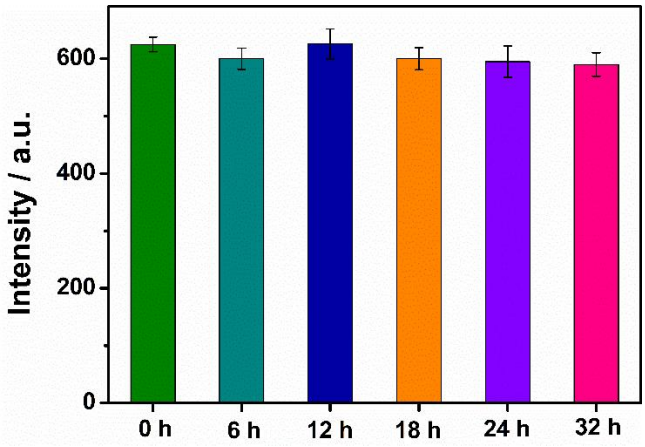

Fig. S7 Fluorescence intensity of ZIF-8@EBTAC with increasing storage time.

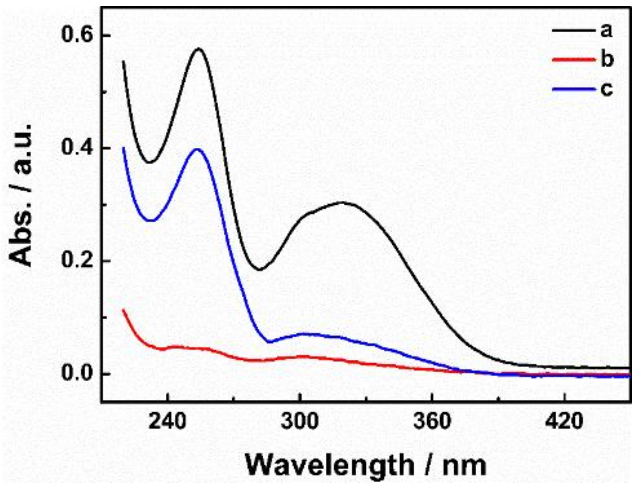

Fig. S8 UV-vis absorption spectra of sole EBTAC (a), the supernatant of ZIF-8@EBTAC in the absence (b) and presence of ppi (100 μM) (c).

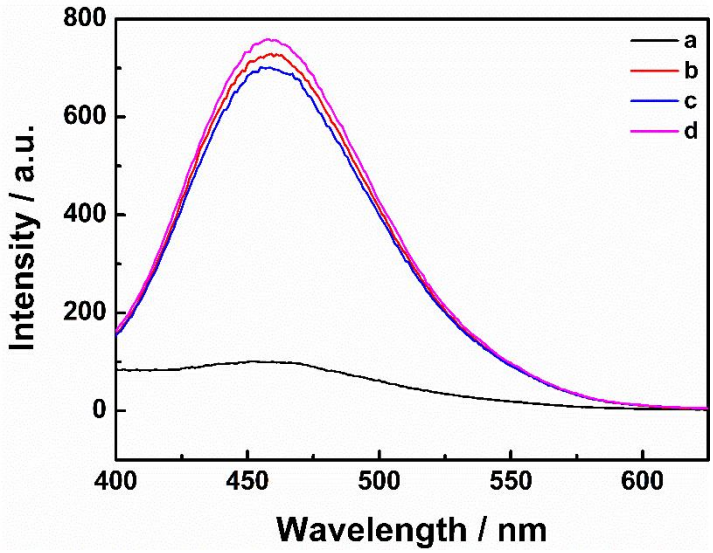

Fig. S9 Fluorescence response of ZIF-8@EBTAC in the presence of ppi (a), $H_2PO_4^-$ (b), HPO_4^{2-} (c) and ppi (d).

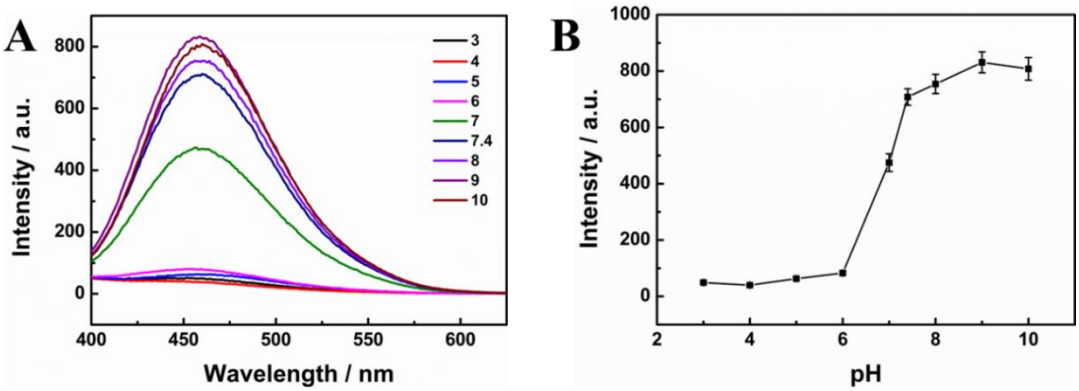

Fig. S10 Fluorescence response of ZIF-8@EBTAC versus different pH values of HEPES buffer.

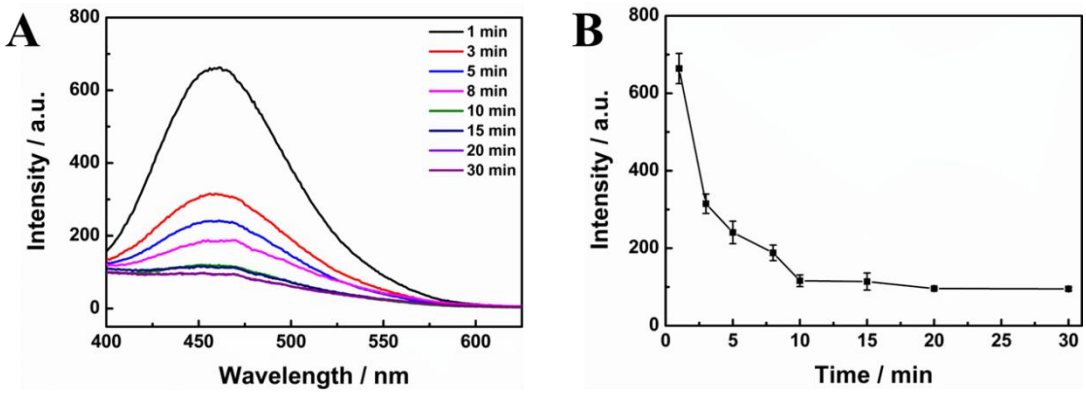

Fig. S11 Effects of the incubation time of ALP with ppi on the fluorescence response of ZIF-8@EBTAC.

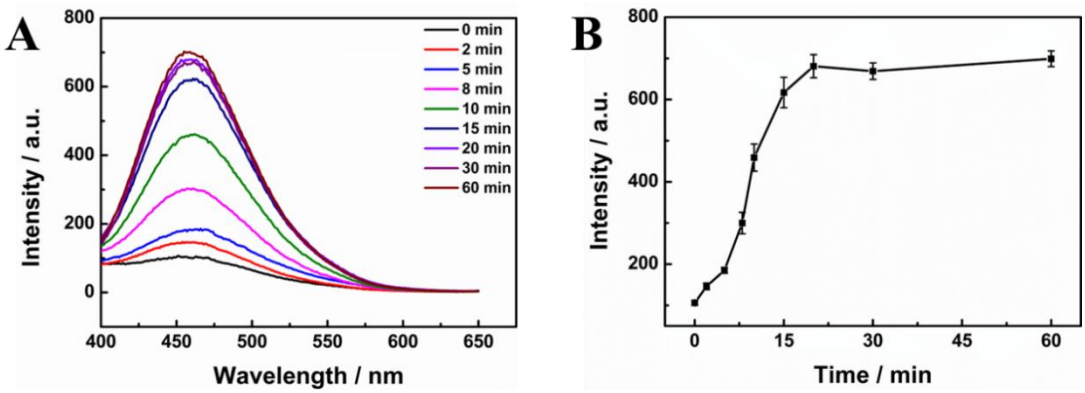

Fig. S12 Effects of the catalyze time of ALP with ppi on the fluorescence response of ZIF-8@EBTAC.

Table S1. Performance comparison of the proposed assay with previously reported systems for the detection of ALP.

Method	Linear range (U/L)	Detection limit (U/L)	Reference
Fluorescence	0.06–600	0.035	S 1
Surface-enhanced Raman scattering	1–300	0.38	S 2
Electrochemical	1.25–100	0.366	S 3
Photoelectrochemical	50–1000	42.1	S 4
Colorimetric	20–800	3.0	S 5
Fluorescence	0.01–100	0.01	This Work

Table S2. Detection of ALP activity in serum samples.

Sample	Added ALP (U/L)	Detected ALP (U/L)	Recovery (%)
1	0	0.1	/
2	10	9.10	91.0
3	50	47.9	95.8
4	100	96.1	96.1

References

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