

Electronic Supplementary Information

of

**Fluorescence light-up AIE probe for monitoring cellular alkaline
phosphatase activity and detecting osteogenic differentiation**

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Table 1 The maximum excitation and emission wavelengths of TPE-PA, TPE-2PA, TPE-4PA and after incubated with ALP.

Samples	λ_{ex}	λ_{em}
TPE-PA	338	469
TPE-2PA	337	457
TPE-4PA	337	469
TPE-PA+ALP (5 min)	347	469
TPE-2PA+ALP (5 min)	346	459
TPE-4PA+ALP (5 min)	342	466
TPE-PA+ALP (60 min)	342	459
TPE-2PA+ALP (60 min)	347	449
TPE-4PA+ALP (60 min)	349	441

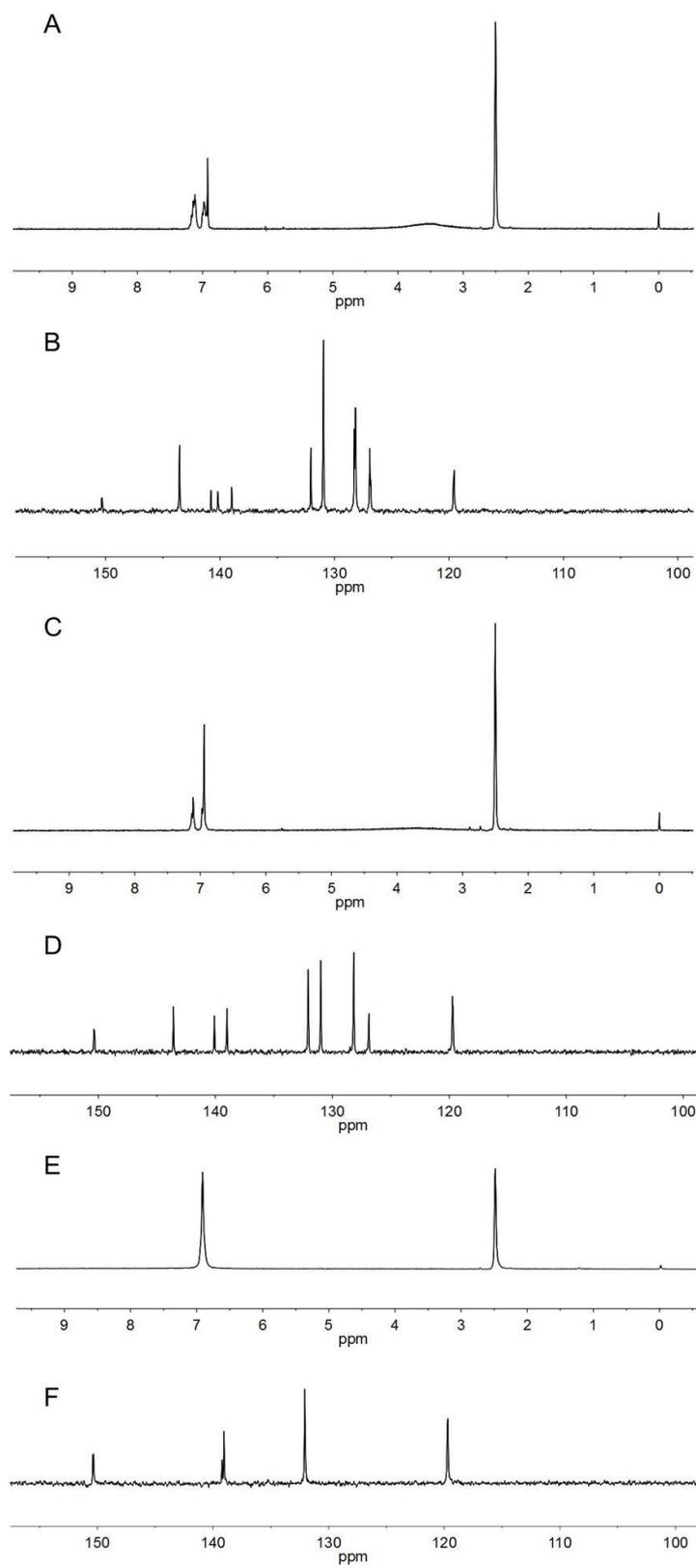


Fig. S1 ^1H NMR of (A) TPE-PA, (C) TPE-2PA and (E) TPE-4PA; ^{13}C NMR of (B) TPE-PA, (D) TPE-2PA and (F) TPE-4PA.

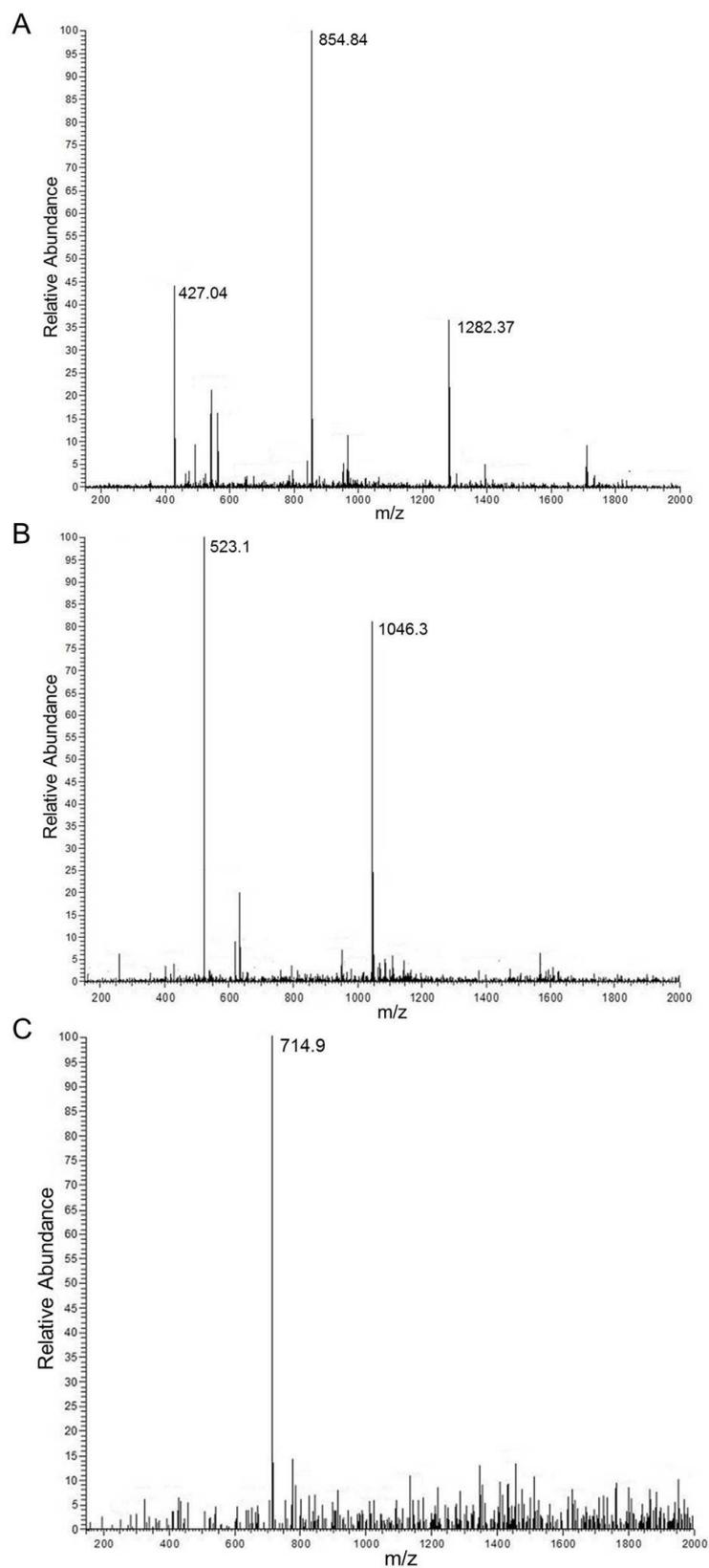


Fig. S2 ESI-MS of (A) TPE-PA, (B) TPE-2PA and (C) TPE-4PA.

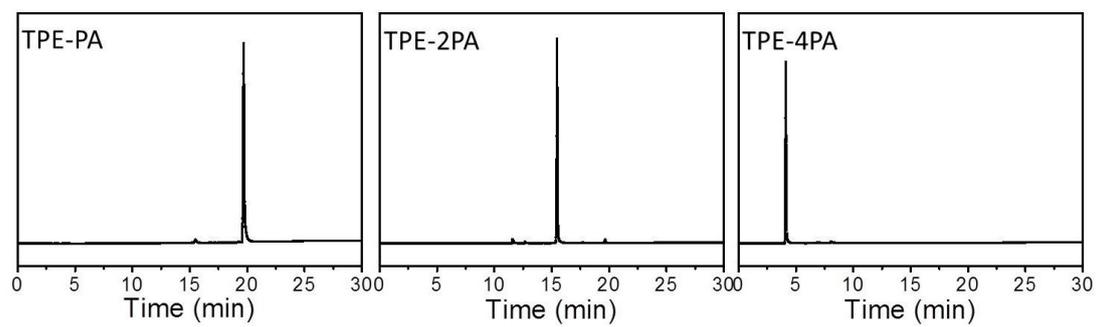


Fig. S3 HPLC traces of TPE-PA, TPE-2PA and TPE-4PA dissolved in methanol.

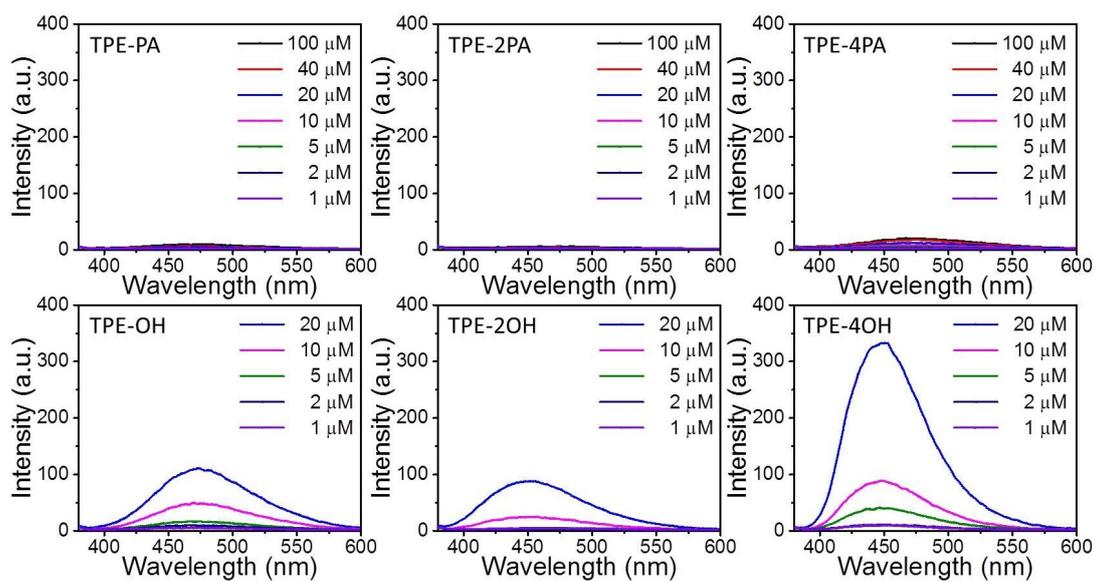


Fig. S4 The fluorescence spectra of TPE-PA, TPE-2PA and TPE-4PA in Tris- HCl buffer at different concentrations (1-100 μM) and TPE-OH, TPE-2OH and TPE-4OH in DMSO/Tris-HCl buffer ($v/v = 1/200$) at different concentrations (1-20 μM).

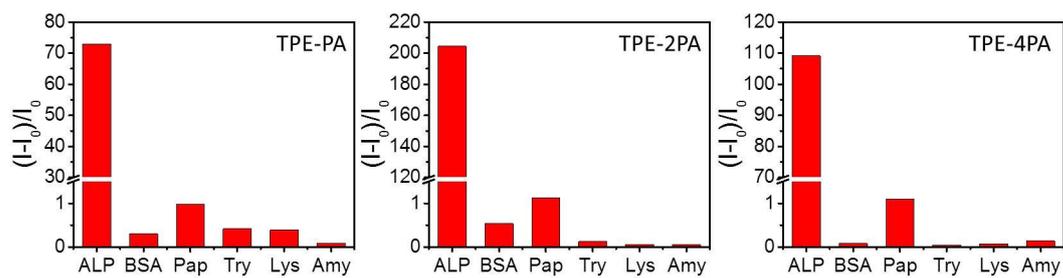


Fig. S5 Plot of $(I - I_0)/I_0$ versus different proteins, where I and I_0 are the fluorescence intensities of TPE-PA, TPE-2PA, TPE-4PA alone and that of TPE-PA, TPE-2PA, TPE-4PA incubated with different proteins. $[TPE-PA] = [TPE-2PA] = [TPE-4PA] = 10 \mu\text{M}$, $\lambda_{\text{ex}} = 335 \text{ nm}$.

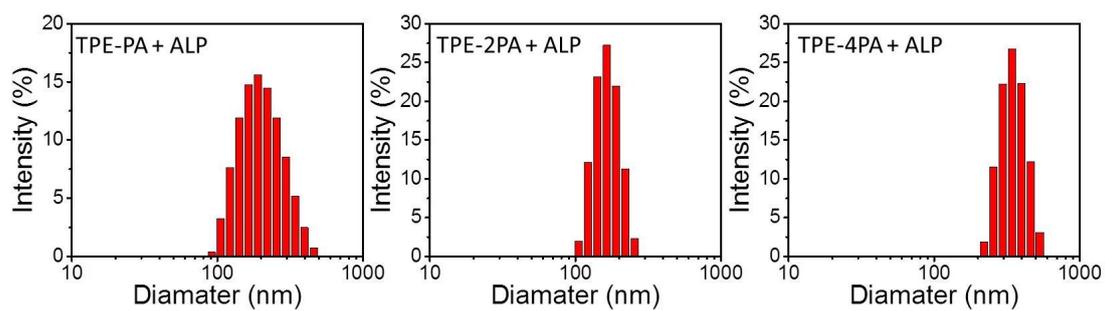


Fig. S6 Dynamic light scattering (DLS) results for the solution of TPE-PA, TPA-2PA incubated with ALP for 5 min and TPE-4PA incubated with ALP for 60 min. [TPE-PA] = [TPE-2PA] = [TPE-4PA] = 40 μ M; [ALP] = 160 mU.

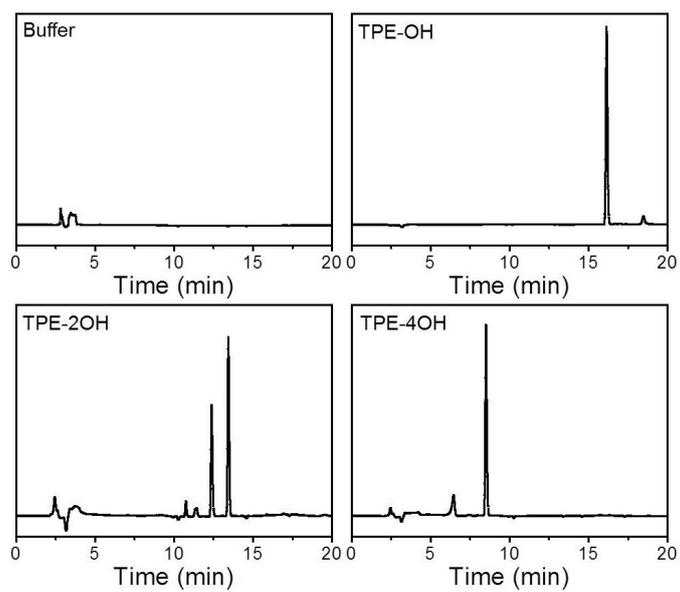


Fig. S7 HPLC traces of Tris-HCl buffer, and TPE-OH, TPE-2OH, TPE-4OH in Tris-HCl buffer.

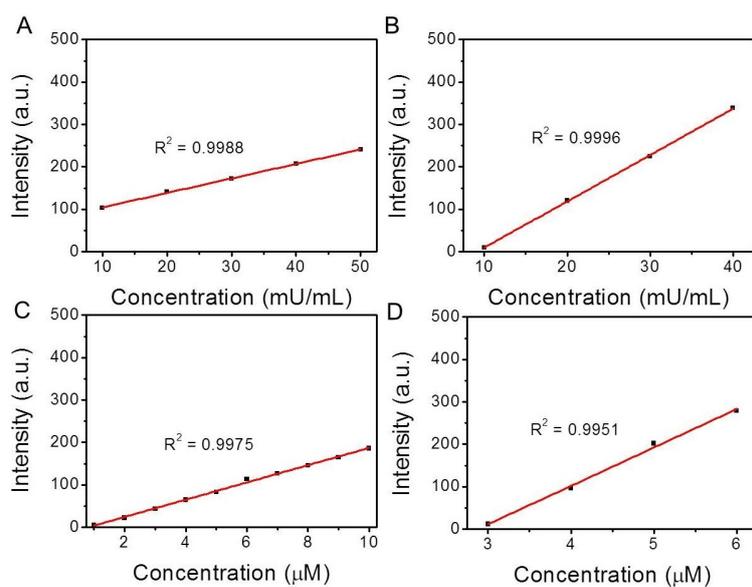


Fig. S8 The linear relations: (A) the fluorescence intensity of TPE-PA with different concentrations of ALP (10-50 mU); (B) the fluorescence intensity of TPE-2PA with different concentrations of ALP (10-50 mU); (C) the fluorescence intensity of TPE-PA with different concentrations of the probe (1-10 μM); (D) the fluorescence intensity of TPE-2PA with different concentrations of the probe (3-6 μM).

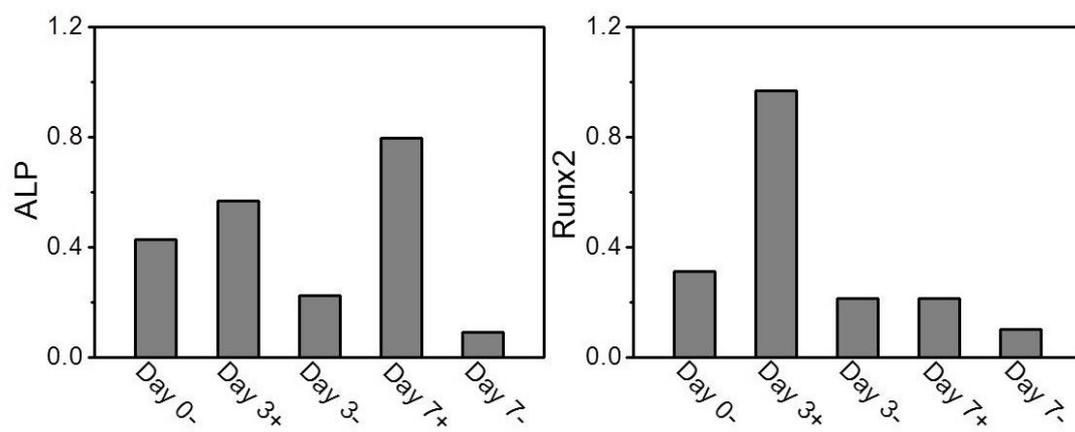


Fig. S9 Quantitative analysis of the light intensities of ALP and Runx2 protein expressions as the ratio to GAPDH.

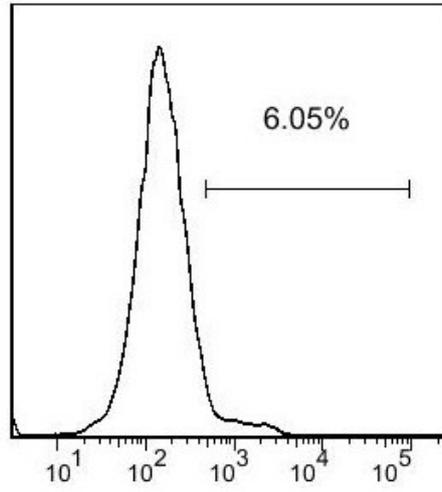


Fig. S10 The flow cytometry analysis of the non-treated cells as negative control.