Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

A pH tuning single fluorescent probe based on naphthalene for multi-analytes (Mg^{2+} and Al^{3+}) and its application in cell imaging

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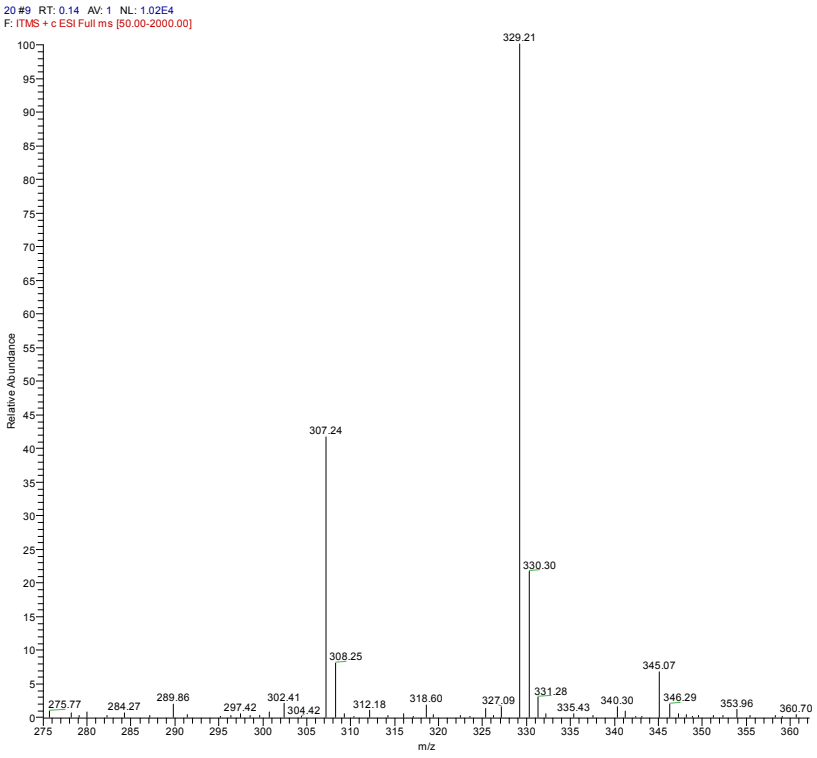

Fig. S1 ESI-MS mass spectra of compound **P**.

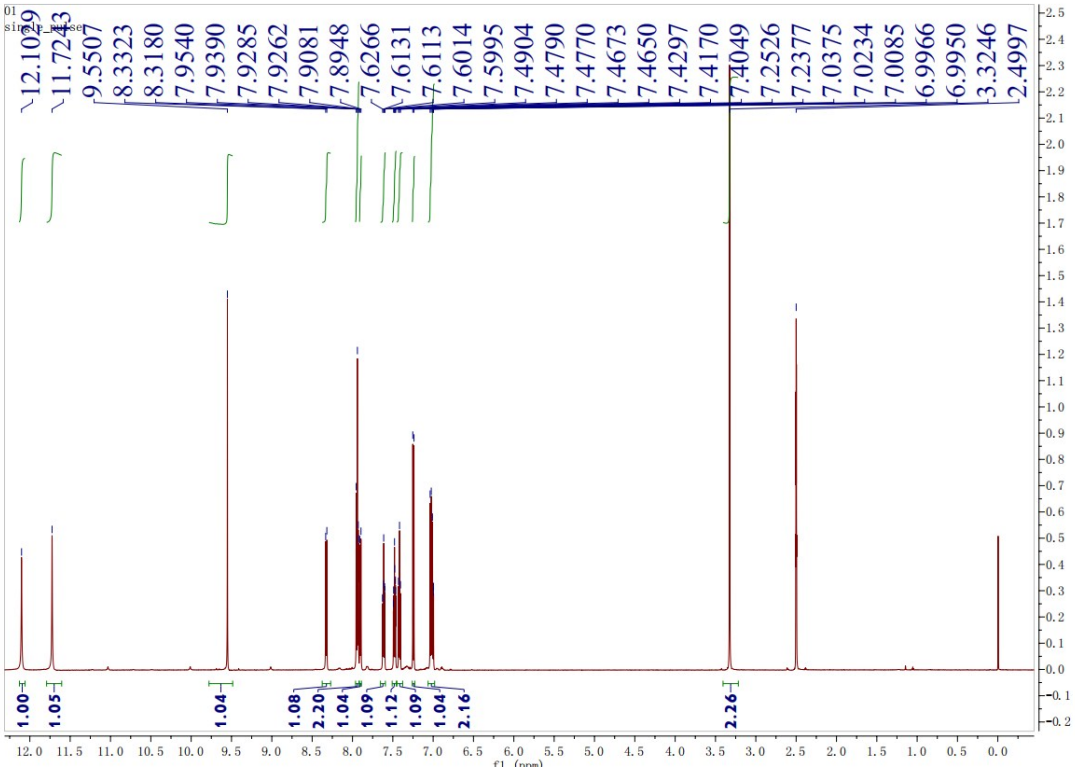

Fig. S2 ^{1}H NMR spectrum of compound **P**.

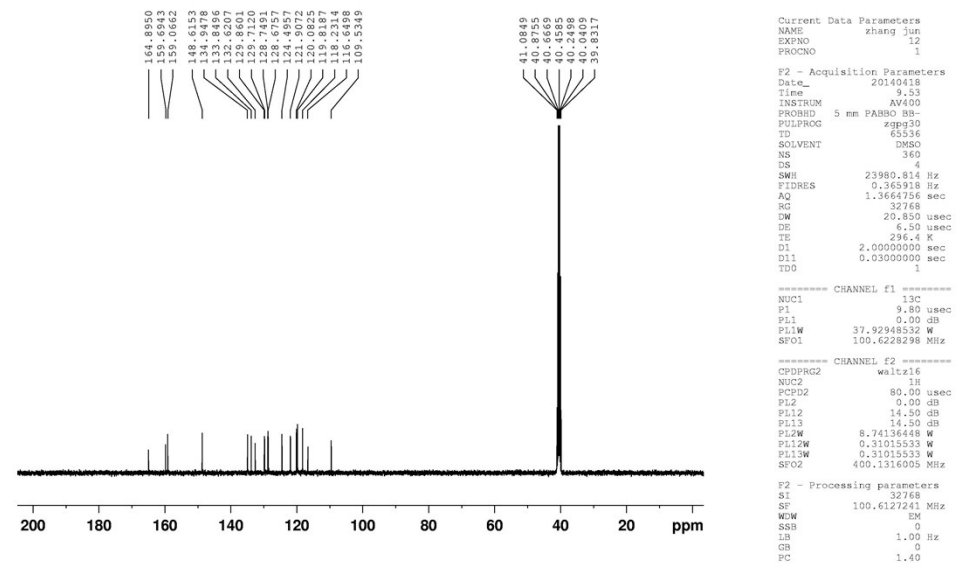

Fig. S3 ^{13}C NMR spectrum of compound **P**.

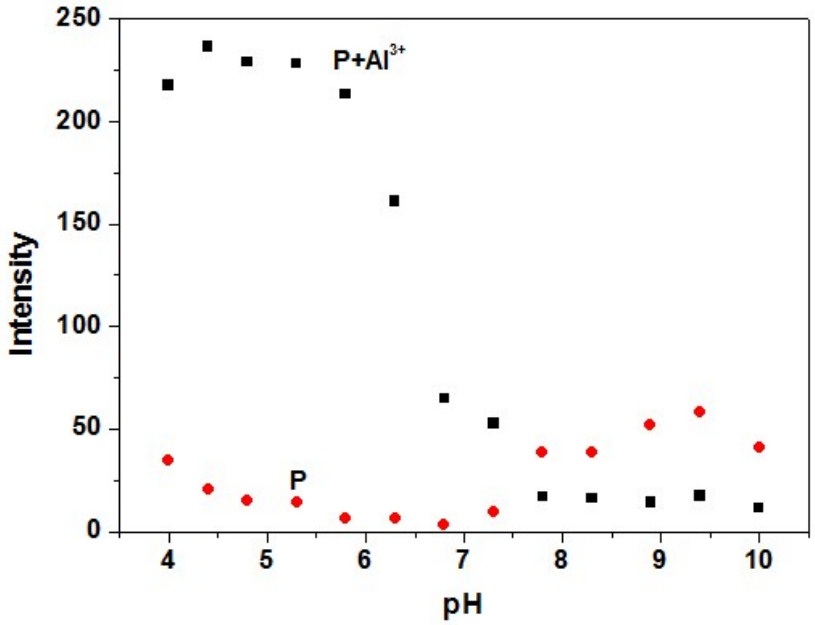

Fig. S4 Influences of pH on the fluorescence spetra of **P** (10 μM) and **P** (10 μM) plus Al^{3+} (10 μM) in the ethanol–water solution (1:9, v:v). The pH was modulated by adding 1.0 M HCl or 1.0 M NaOH in HEPES buffers.

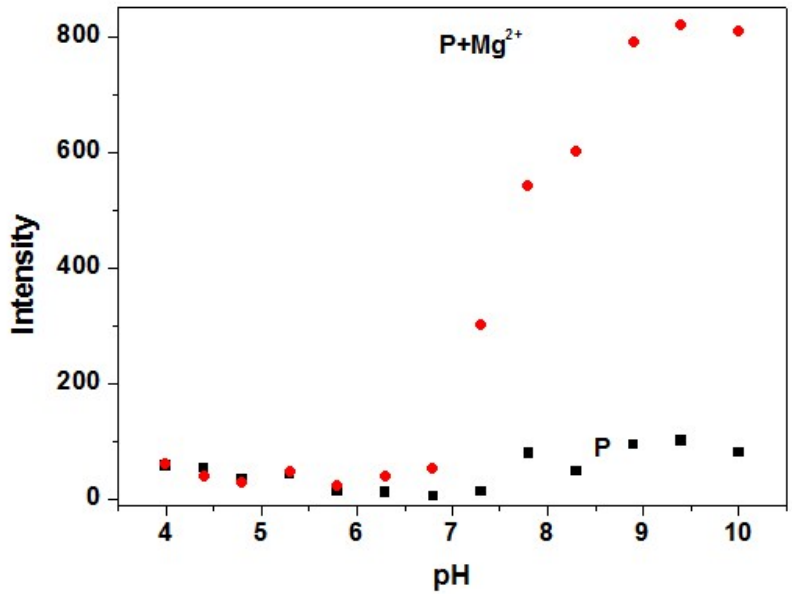

Fig. S5 Influences of pH on the fluorescence spetra of **P** (10 μM) and **P** (10 μM) plus Mg^{2+} (10 μM) in the ethanol–water solution (1:9, v:v). The pH was modulated by adding 1.0 M HCl or 1.0 M NaOH in HEPES buffers.

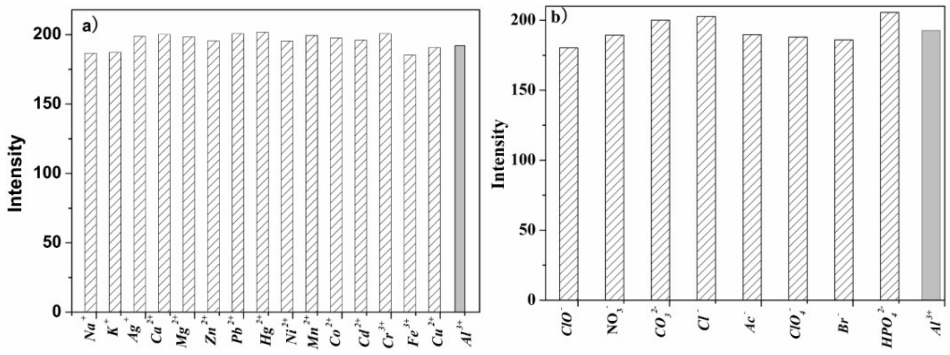

Fig. S6 a) Fluorescence response of **P** (10 μM) to 10 μM of Al^{3+} and to the mixture of 10 μM individual other metal ions with 10 μM of Al^{3+} in ethanol-water solution (1:9, v:v, 20 mM HEPES, pH 6.3); b) Fluorescence response of **P** (10 μM) to 10 μM of $Al^{3+}$and to the mixture of 10 μM individual anions with 10 μM of Al^{3+}in ethanol-water solution (1:9, v:v, 20 mM HEPES, pH 6.3).

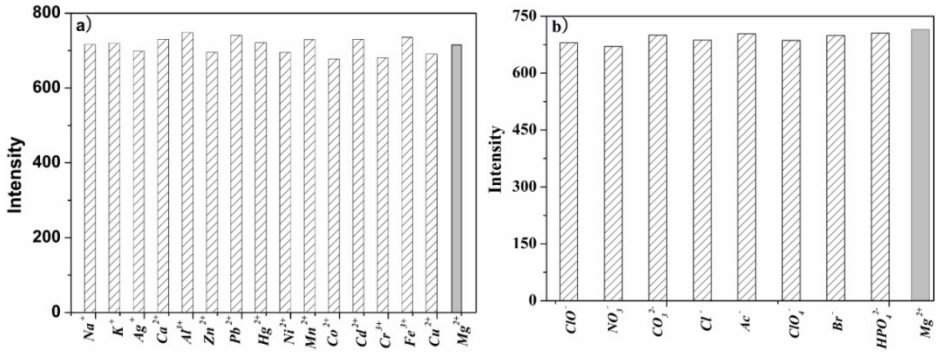

Fig. S7 a) Fluorescence response of **P** (10 μM) to 10 μM of $Mg^{2+}$and to the mixture of 10 μM individual other metal ions with 10 μM of Mg^{2+} in ethanol-water solution (1:9, v:v, pH 9.4, 20 mM HEPES); b) Fluorescence response of **P** (10 μM) to 10 μM of Mg^{2+} and to the mixture of 10 μM individual anions with 10 μM of Mg^{2+}in ethanol-water solution (1:9, v:v, pH 9.4, 20 mM HEPES).

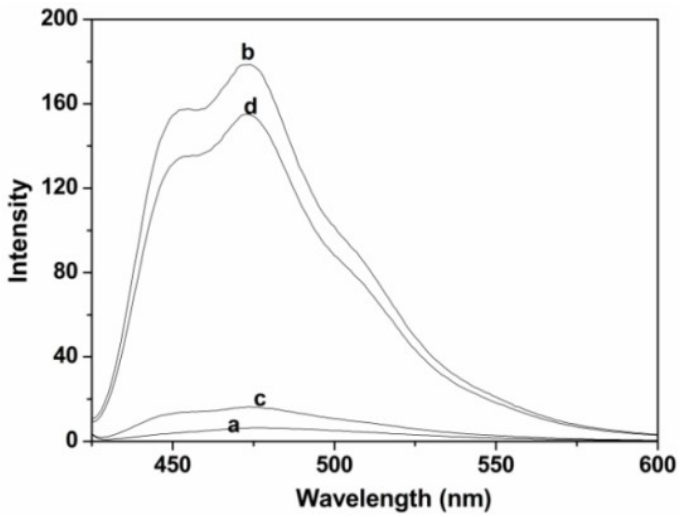

Fig. S8 Fluorescence response in ethanol-water solution (1:9, v:v, pH 6.3, 20 mM HEPES): a) **P** (10 μM); b) **P** (10 μM) with Al^{3+} (10 μM); (c) **P** (10 μM) with Al^{3+} (10 μM) and then addition of EDTA (50 μM); (d) **P** (10 μM) with Al^{3+} (10 μM) and then addition of EDTA (50 μM) and then addition of 0.1 mM Al^{3+}.

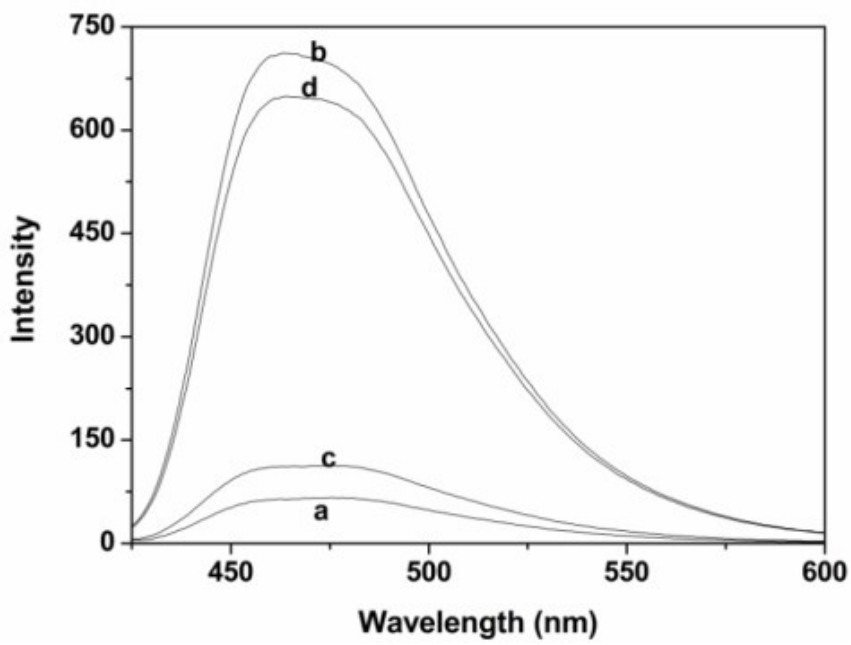

Fig. S9 Fluorescence response in ethanol-water solution (1:9, v:v, pH 9.4, 20 mM HEPES): a) **P** (10 μM); b) **P** (10 μM) with Mg^{2+} (10 μM); (c) **P** (10 μM) with Mg^{2+} (10 μM) and then addition of EDTA (50 μM); (d) **P** (10 μM) with Mg^{2+} (10 μM) and then addition of EDTA (50 μM) and then addition of 0.1 mM Mg^{2+}.

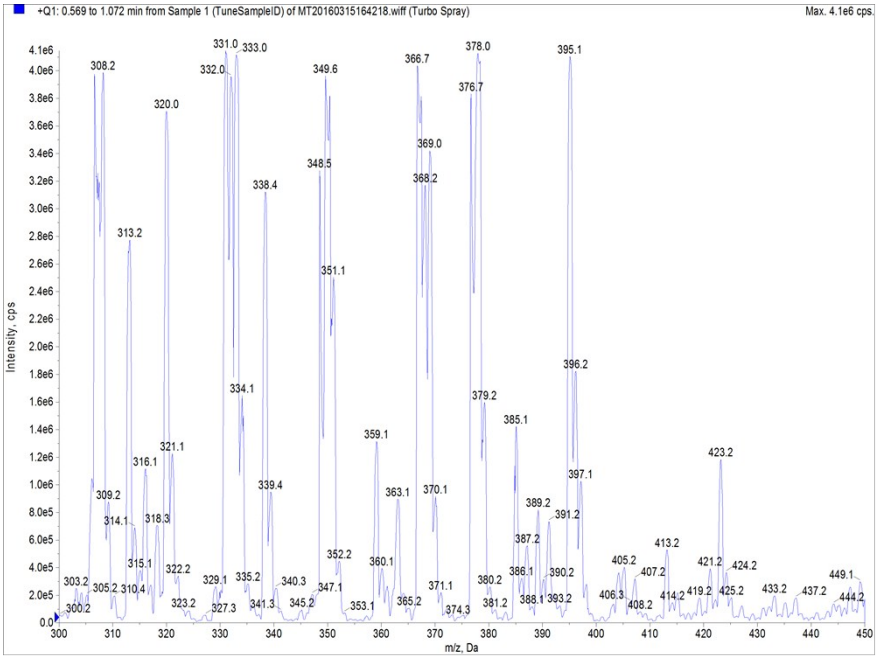

Fig. S10 Partial ESI-MS of **P** in the presence of 1.0 equiv. of Al^{3+} in ethanol.

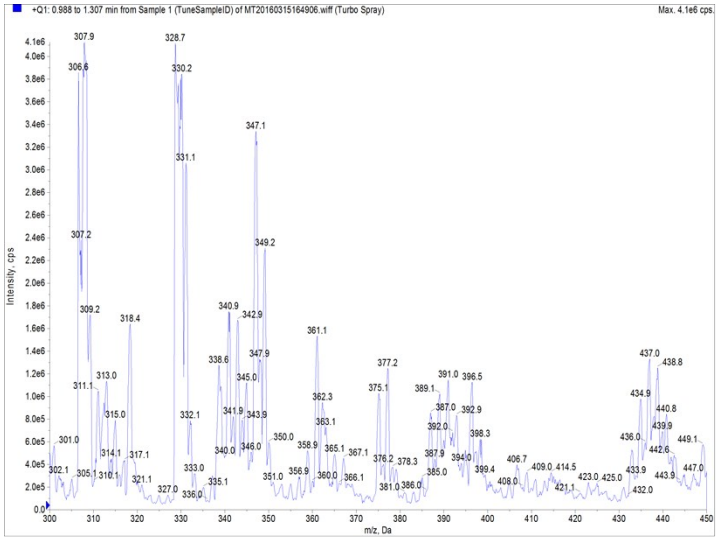

Fig. S11 Partial ESI-MS of **P** in the presence of 1.0 equiv. of Mg^{2+} in ethanol.

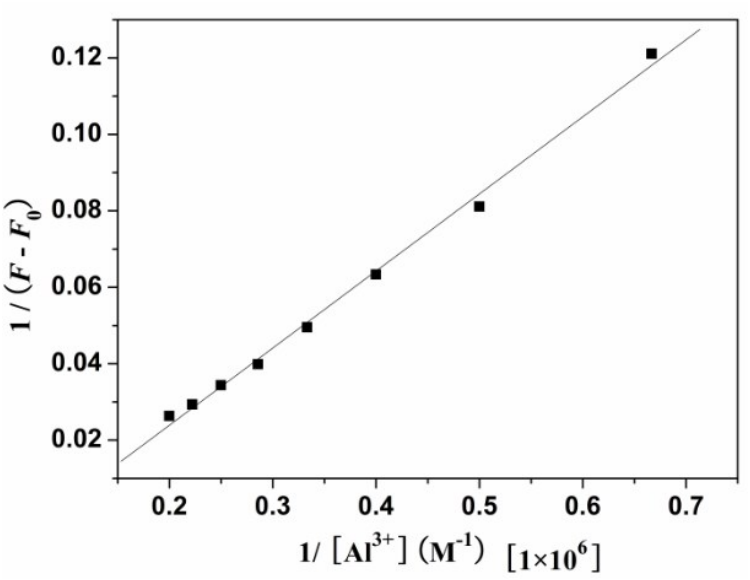

Fig. S12 Benesi-Hildebrand plot of **P**, assuming 1:1 stoichiometry for **P**-Al^{3+}.

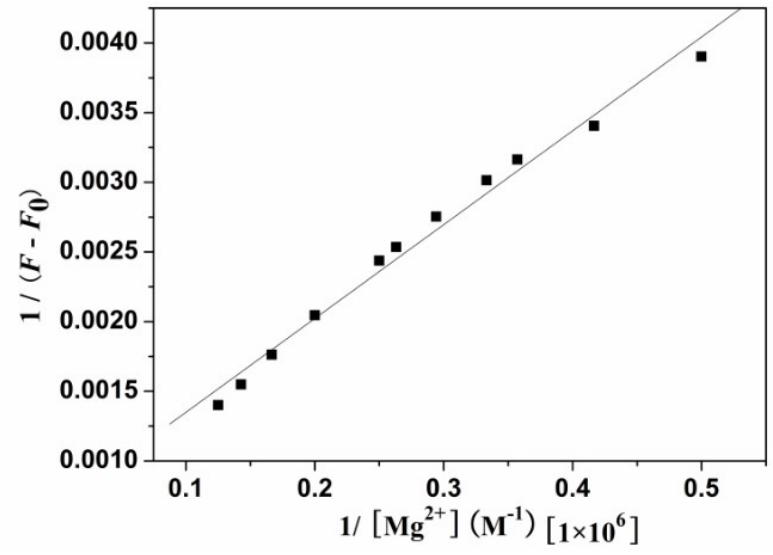

Fig. S13 Benesi-Hildebrand plot of **P**, assuming 1:1 stoichiometry for **P**-Mg^{2+}.

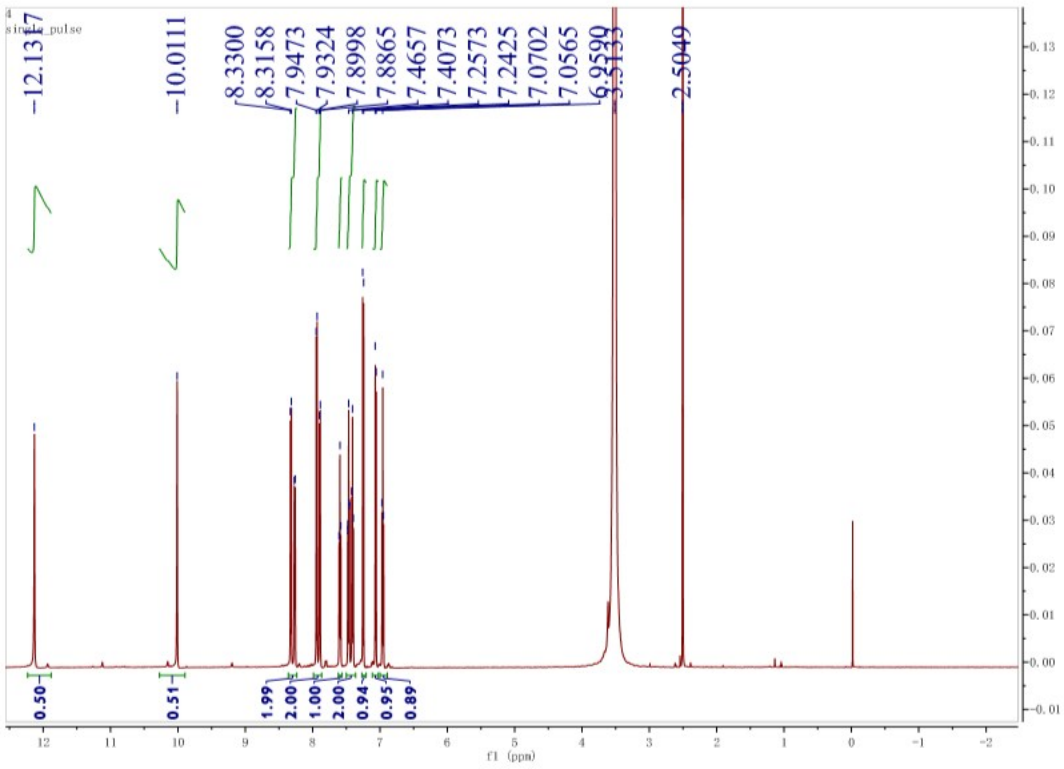

Fig. S14 ^{1}H NMR of **P**-Mg^{2+}. (Nuclear magnetic resonance (NMR) spectra were measured with a Brucker AV 600 instrument and chemical shift were given in ppm from tetramethylsilane (TMS)).

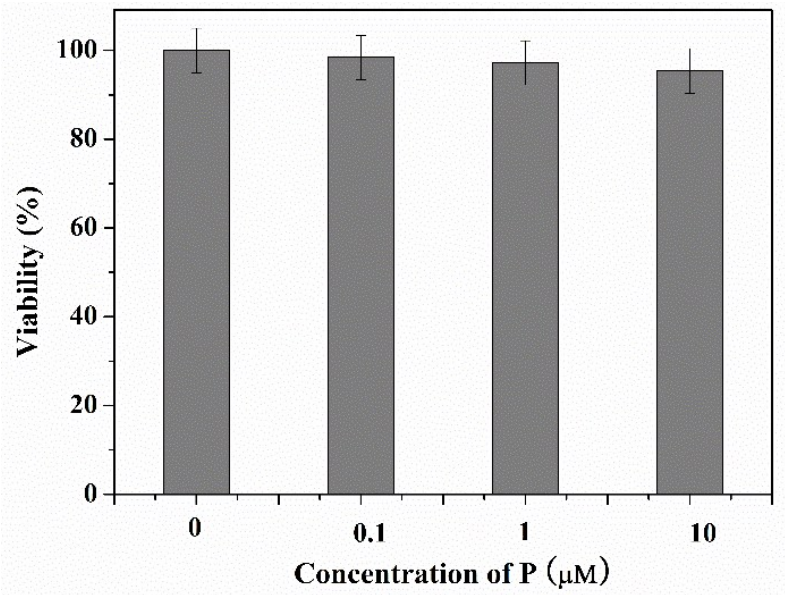

Fig. S15 Cell viability values (%) estimated by MTT proliferation test versus incubation concentrations of **P**. HepG2 cells were cultured in the presence of 0−10 μM **P** at 37 °C.