Supporting Information

A quinolinyl antipyrine based fluorescence sensor for Zn^{2+} and its application in bioimaging

Qi-Hua You, [a] Pui-Shan Chan,[b] Wing-Hong Chan,*[a] Sam C. K. Hau,[c] Albert W. M. Lee,[a] N. K. Mak,[b] Thomas C. W. Mak[c] and Ricky N. S. Wong[b]

[a]*Department of Chemistry, Hong Kong Baptist University, Hong Kong, China*
[b] *Department of Biology, Hong Kong Baptist University, Hong Kong*
[c]*Department of Chemistry, The Chinese University of Hong Kong, Shatin, Hong Kong, China*

Tel.: +852-3411-7076; fax: +852-3411-7348

E-mail: whchan@hkbu.edu.hk

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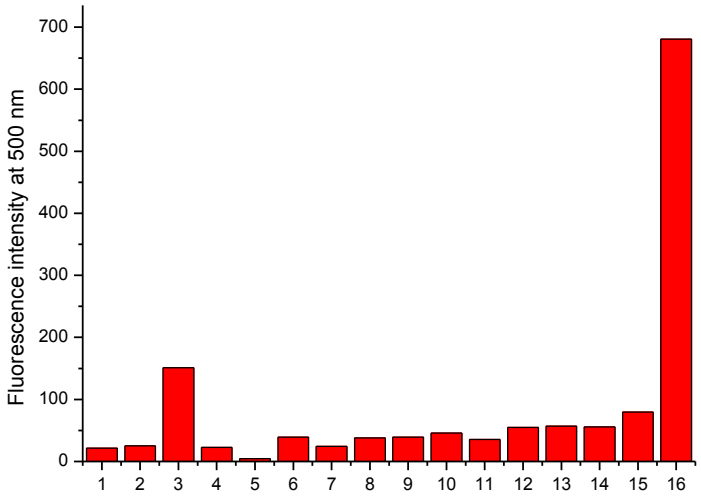

Fig. S1 Fluorescence intensity at 500 nm of **AQA** (10 μM) in 25% ACN-HEPES buffer (100 mM, pH = 7.0) upon addition of different metal ions (10 equiv).
Ex = 330 nm, slit = 5 nm.
(1) Free, (2) Ca^{2+}, (3) Cd^{2+}, (4) Co^{2+}, (5) Cu^{2+}, (6) Fe^{2+}, (7) Fe^{3+}, (8) Hg^{2+}, (9) K^{+}, (10) Li^{+}, (11) Mg^{2+}, (12) Na^{+}, (13) Ni^{2+}, (14) Ag^{+}, (15) Pb^{2+}, (16) Zn^{2+}

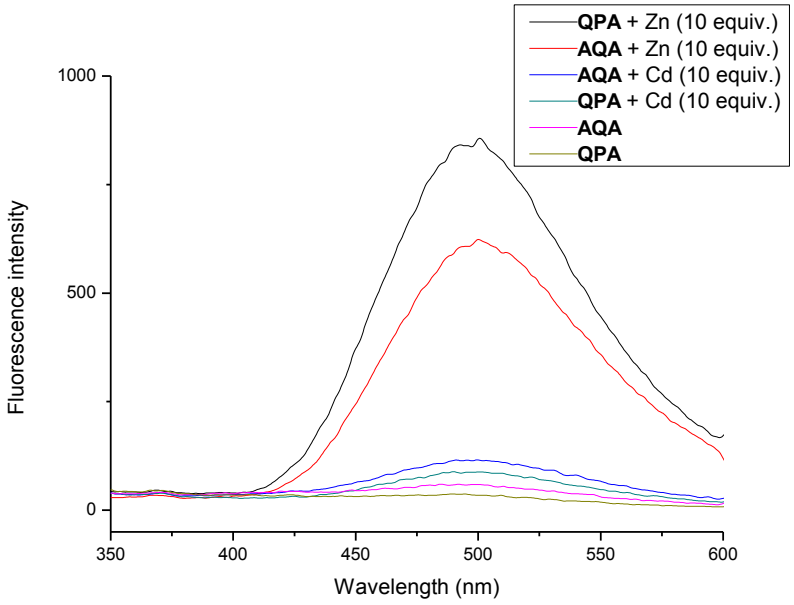

Fig. S2 Fluorescence spectra of **QPA** and **AQA** (10 μM) in 25% ACN-HEPES buffer (100 mM, pH = 7.0) upon addition of Zn^{2+} and Cd^{2+} respectively.

Detection of limit

The detection limit was calculated based on the fluorescence titration. To improve the sensitivity, probe **QPA** was employed at 1 μM and the slit was adjusted to 15 nm/15 nm. To determine the S/N ratio, the emission intensity of **QPA** without any cation was measured by 10 times and the standard deviation of blank measurements was determined. Under the present conditions, a good linear relationship between the fluorescence intensity and Zn^{2+} concentration could be obtained in the 0 – 0.9 μM (R^2 = 0.9915), as shown in Fig. S13. The detection limit is then calculated with the equation: detection limit = $3\sigma_{bi}/m$, where σ_{bi} is the standard deviation of blank measurements, m is the slope between intensity versus sample concentration. The detection limit was measured to be 1.3×10^{-7} M at S/N = 3 (signal-to-noise ratio of 3:1).

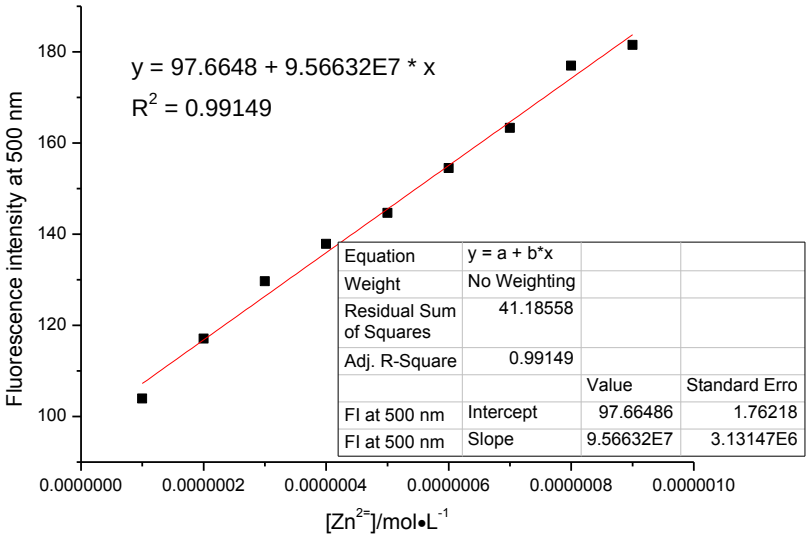

Fig. S3 Fluorescence intensity at 500 nm of **QPA** (1 μM) in 25% ACN-HEPES buffer (100 mM, pH = 7.0) as a function of concentration of free Zn^{2+} (0 ~ 10 μ M). Slit = 10 nm.

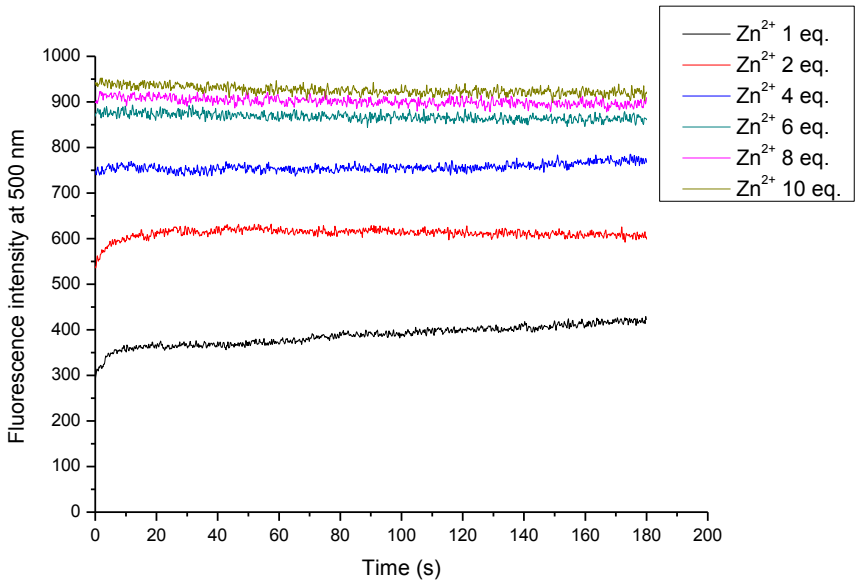

Figure S4 Time-dependent fluorescence enhancement of **QPA** (10 μM) in 25% ACN-HEPES buffer (100 mM, pH = 7.0) upon addition of different concentrations of Zn^{2+}. Fluorescence intensity was recorded at 500 nm. λ_{ex} = 330 nm.

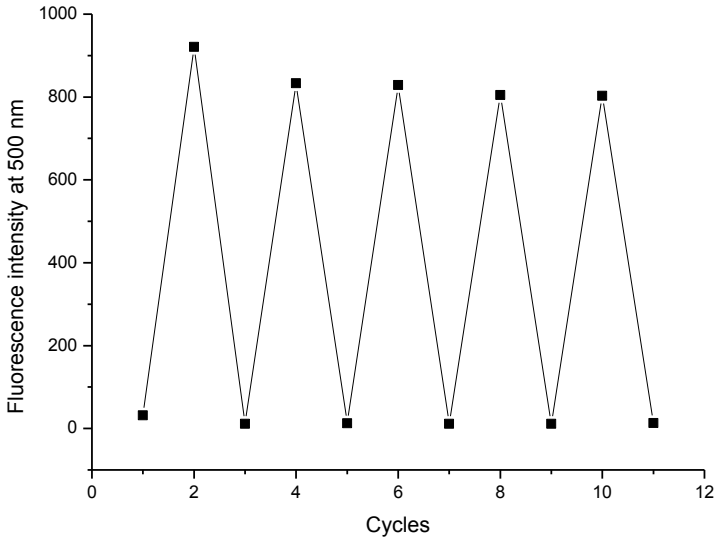

Fig. S5 Fluorescence intensity at 500 nm of **QPA** (10 μM) in 25% ACN-HEPES (100 mM, pH = 7.0) upon the alternate addition of Zn^{2+}/EDTA with several concentrations (0:0, 100:0, 100:100, 200:100, 200:200, 300:200, 300:300, 400:300, 400:400, 500:400 and 500:500 μM, respectively). λ_{ex} = 330 nm.

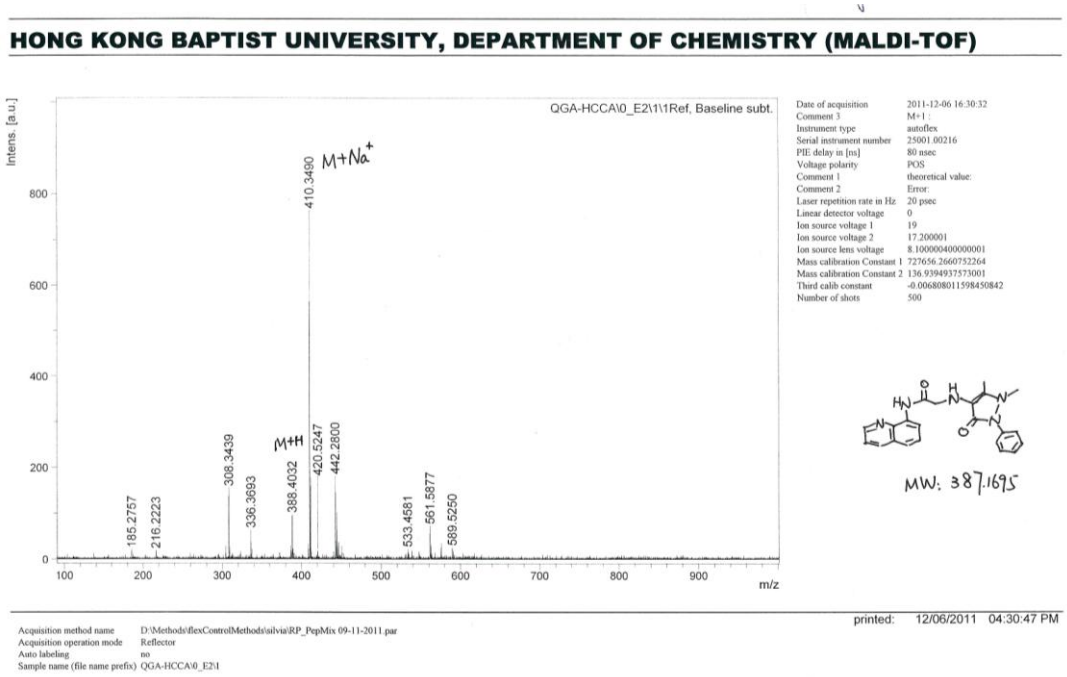

Fig. S6 MALDI-TOF HRMS spectrum of **QPA**.

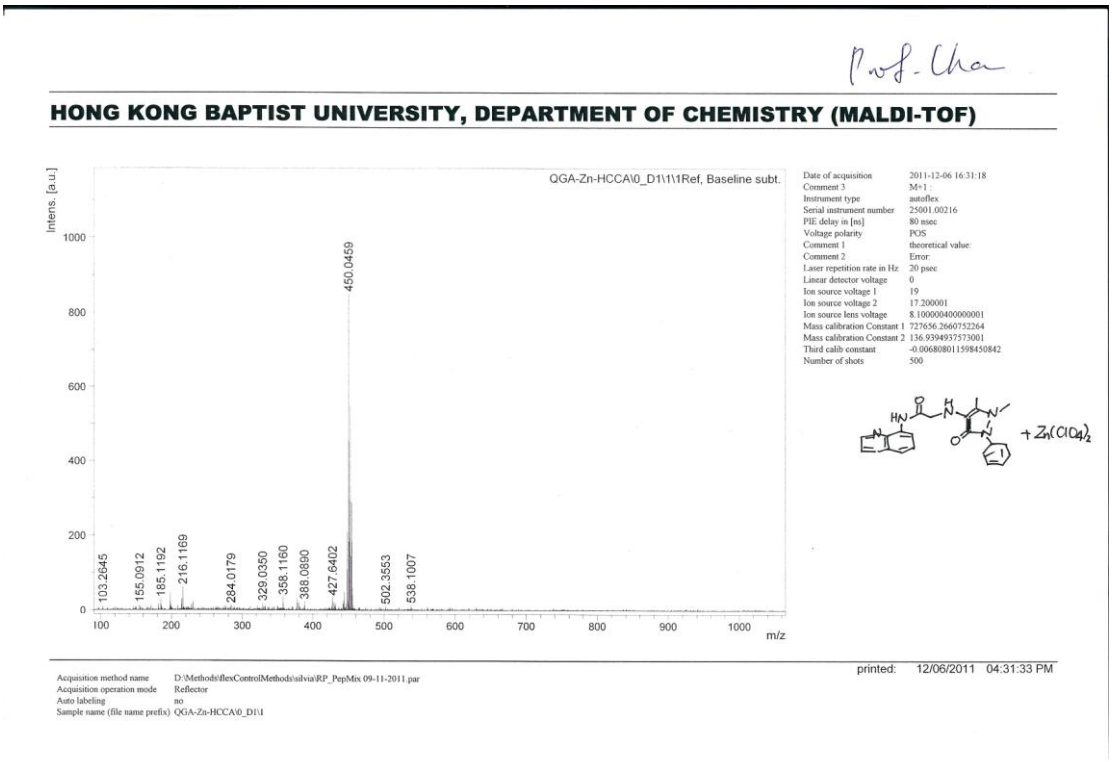

Fig. S7 MALDI-TOF HRMS spectrum of **QPA** + $Zn(ClO_4)_2$.

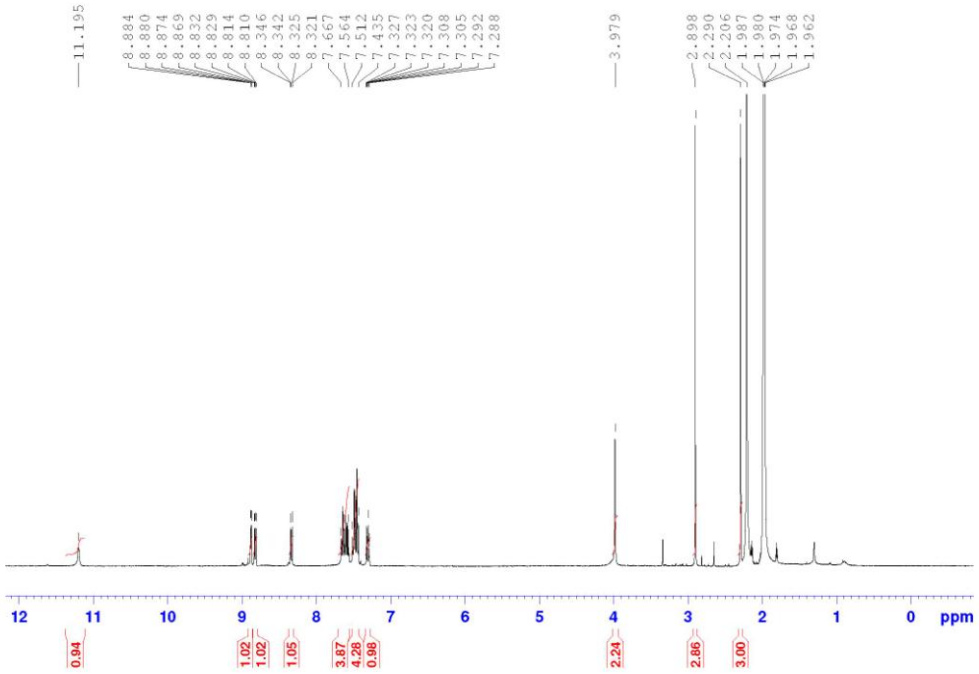

Fig. S8 ^{1}H NMR spectrum of **QPA**.

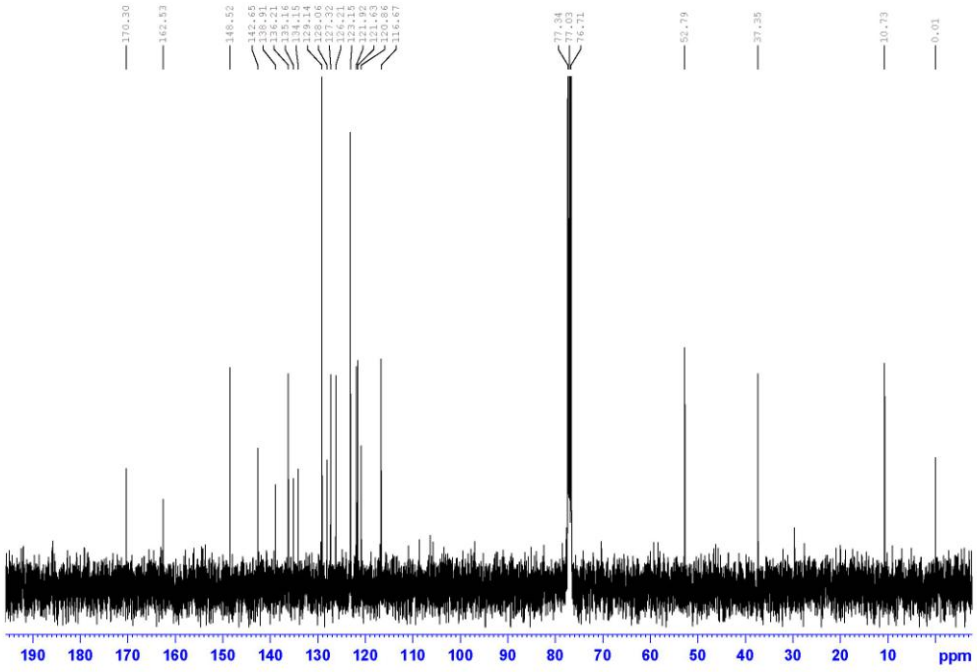

Fig. S9 ^{13}C NMR spectrum of **QPA**.