Supporting Information for

A Novel Fluorescent "Turn-Off/Turn-On" System for the Detection of Acid Phosphatase Activity

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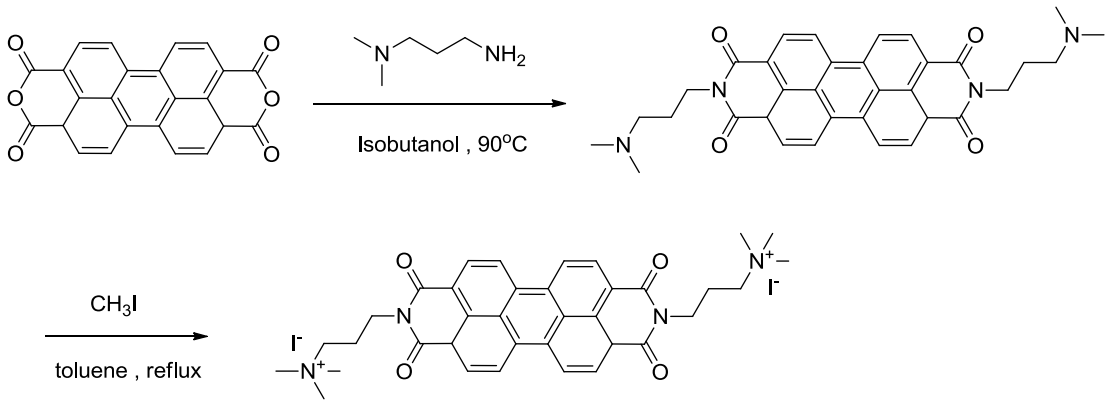
Materials, methods and instrumentation.

The following solvents, compounds and reagents were commercially available: perylene tetracarboxylic dianhydride, 3-dimethylaminopropylamine, were bought from Sigma-Aldrich. Isobutanol, ethanol, NaOH, methyl iodide, toluene, ether were bought from SCRC (Shanghai, China). Acid phosphatase from potato (ACP), ATP, $(NaPO_3)_6$, $(NaPO_3)_n$ and $Na_5P_3O_{10}$ was bought from Sigma-Aldrich. $KMoO_4$ was bought from Alfa Aesar. The other proteins and enzymes such as BSA, thrombin, nitroreductase, tyrosinase and trypsase were bought from Sigma-Aldrich.

^1H and ^{13}C NMR spectra were recorded on Varian Mercury 300 spectrometers, respectively. API-ES were recorded on Agilent LC/MS 6120B. Fluorescent emission spectra were collected on PerkinElmer LS 55 with an excitation wavelength of 495 nm, the excitation and emission slit widths were 10 and 6 nm, respectively. UV absorption spectra were collected on SHIMADZU UV-2550. Quartz cuvettes with 2mL volume were used for emission measurements. Unless otherwise specified, all spectra were taken at an ambient temperature.

General procedure for the synthesis of Probe 1[1]



Scheme S1. Synthesis of Probe 1

Probe **1** was prepared by the literature methods [1].

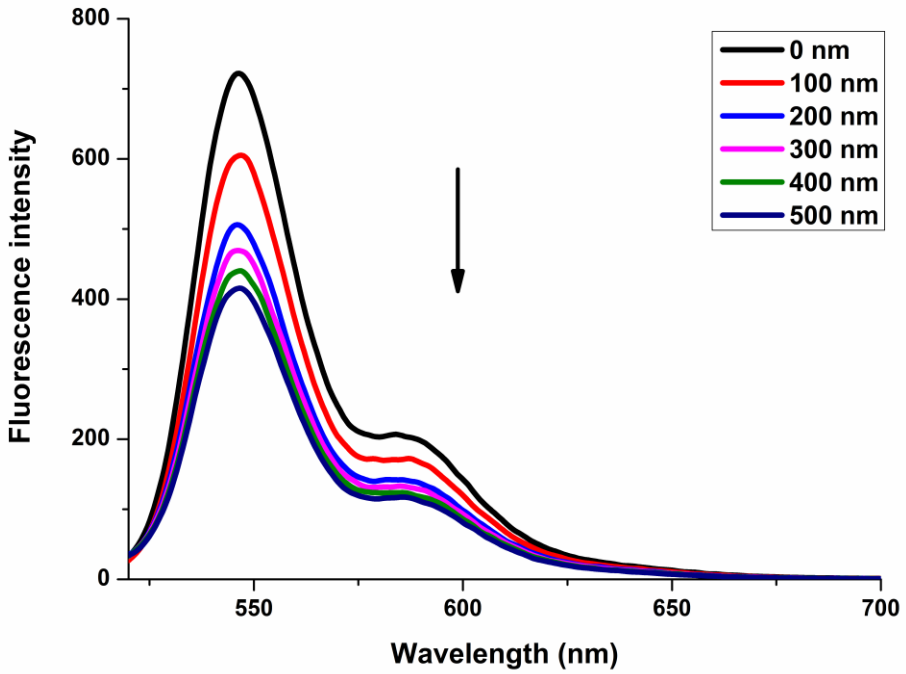


Fig. S1 Changes in the emission spectrum of probe **1** (1 μM) upon the addition of ATP at different concentrations (0–500 nm).

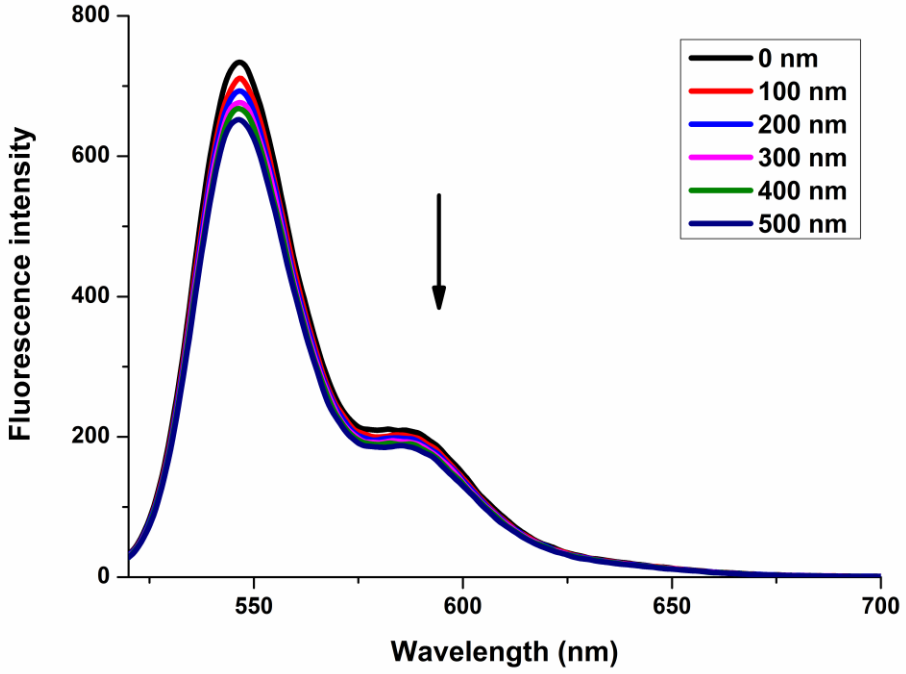


Fig. S2 Changes in the emission spectrum of probe **1** (1 μM) upon the addition of $Na_5P_3O_{10}$ at different concentrations (0–500 nm).

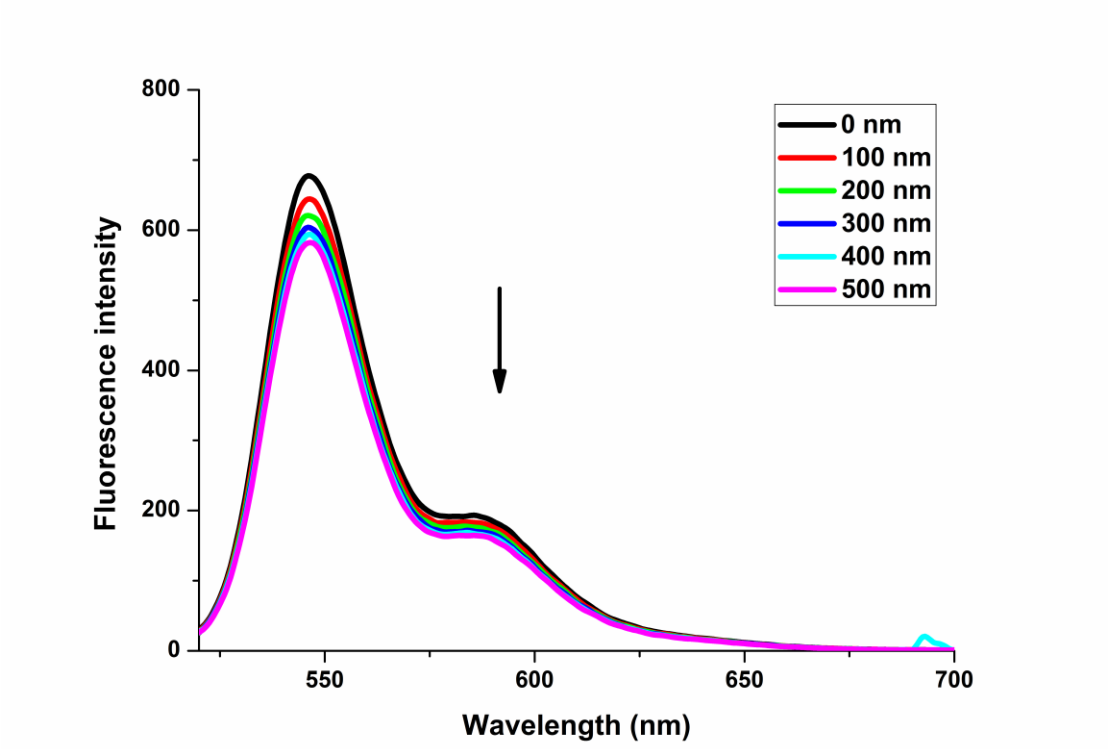


Fig. S3 Changes in the emission spectrum of probe **1** (1 μM) upon the addition of $(NaPO_3)_n$ at different concentrations (0–500 nm).

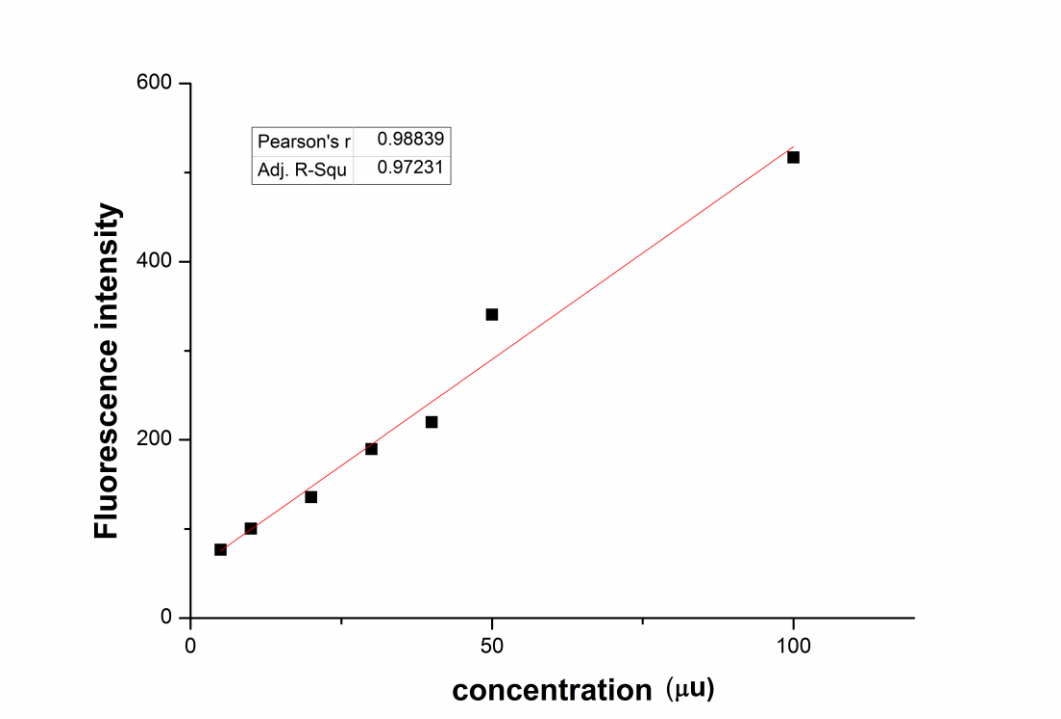


Fig. S4 Linearity on concentrations of ACP and fluorescence intensity of reaction solution.

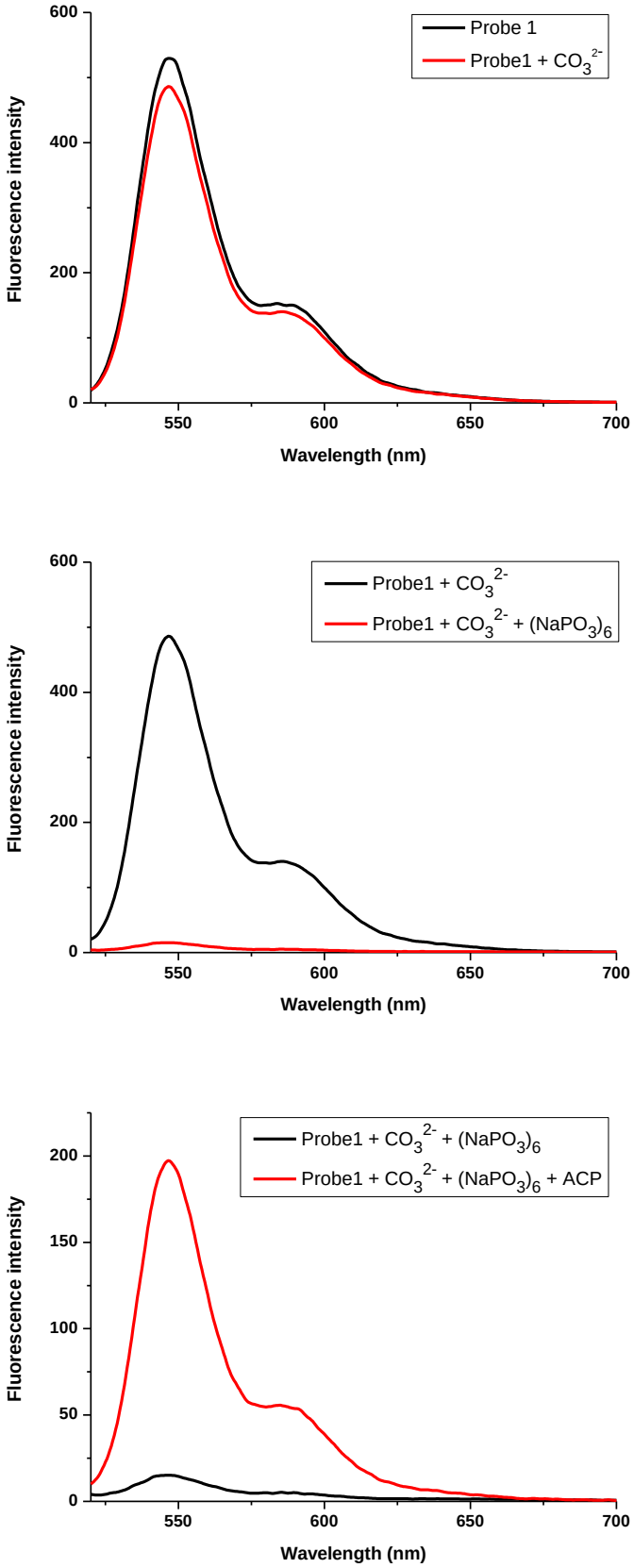


Fig. S5 The influence of CO_3^{2-} on detection of ACP using our method. Probe 1 (1 μM), Na_2CO_3 (4.2 μM), $(NaPO_3)_6$ (700 nM), ACP (100 μunits / mL).

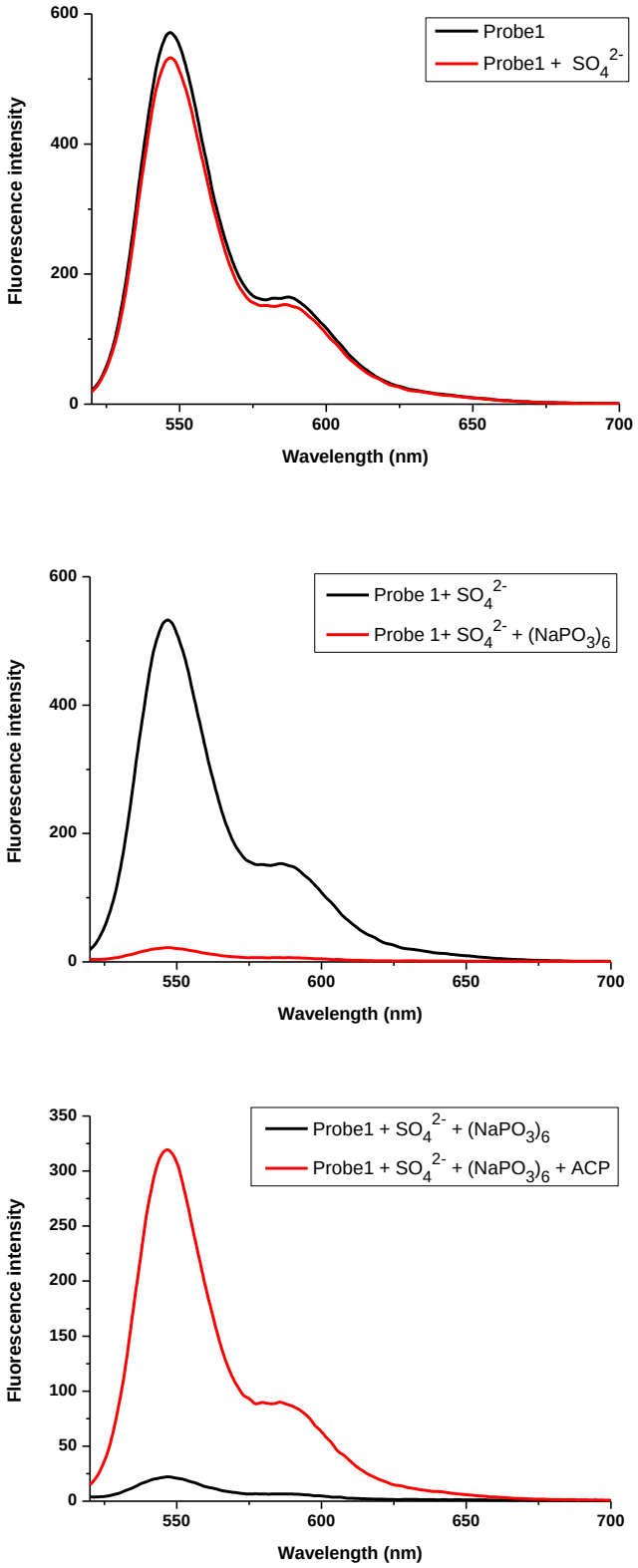


Fig. S6 The influence of SO_4^{2-} on detection of ACP using our method. Probe 1 (1 μM), Na_2SO_4 (4.2 μM), $(NaPO_3)_6$ (700 nM), ACP (100 μunits / mL).

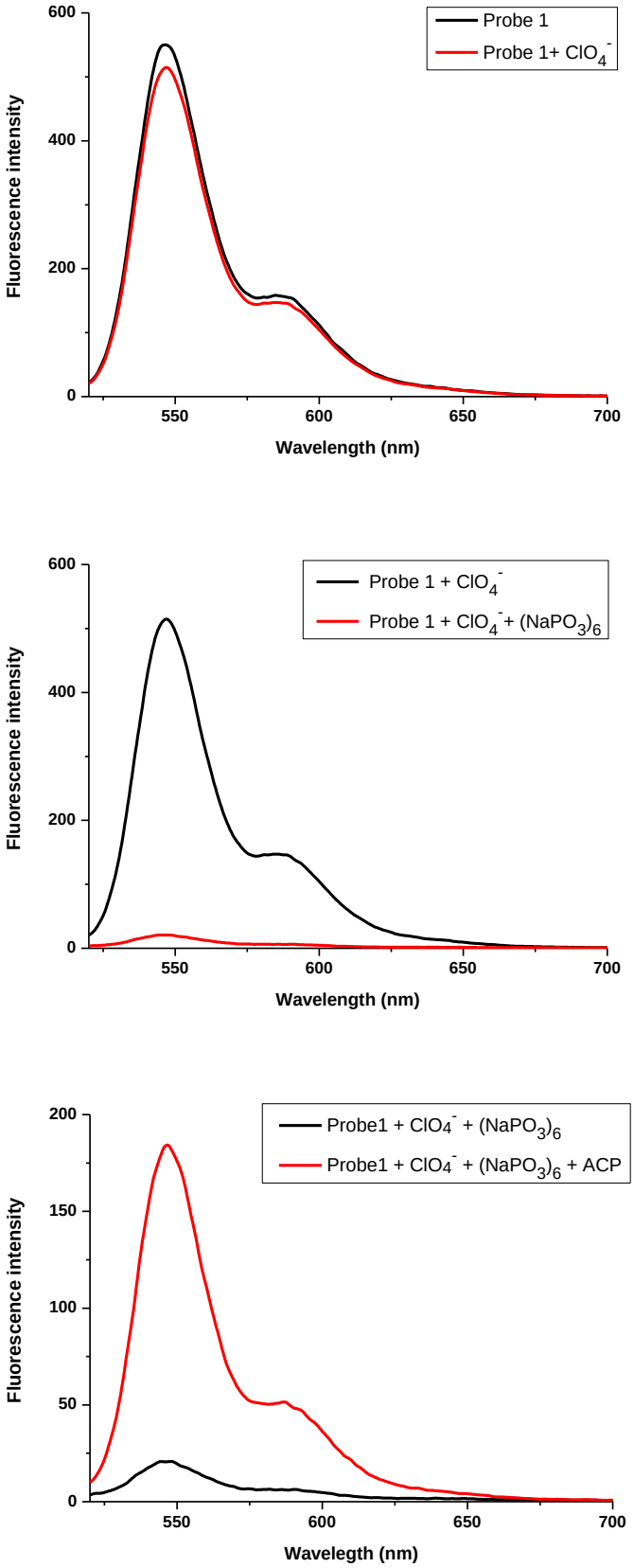


Fig. S7 The influence of ClO_4^- on detection of ACP using our method. Probe 1 (1 μM), $NaClO_4$ (4.2 μM), $(NaPO_3)_6$ (700 nM), ACP (100 μunits / mL).

References:

1. B. Wang, C. Yu, *Angew. Chem. Int. Ed.* 2010, **49**, 1.