Supporting Information for

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

Pu Guo, ‡ Shengyong Yan, ‡ Yimin Zhou, Changcheng Wang, Xiaowei Xu, Xiaocheng Weng,
Xiang Zhou*

College of Chemistry and Molecular Sciences, Key Laboratory of Biomedical Polymers of Ministry of Education, Wuhan University, Hubei, Wuhan, 430072, P. R. of China, Corresponding Author Email Address: xzhou@whu.edu.cn
Table of Contents

Materials, methods and instruments......................................................S3
General procedure for the synthesis of Probe 1.......................................S3
Changes in the emission spectrum of probe 1 upon the addition of ATP, Na₅P₃O₁₀, (NaPO₃)ₙ..............................................................S4-S5
Linearity of ACP and fluorescence intensity...........................................S5
Influence of anions with large sizes.....................................................S6-S8
References.........................................................................................S9
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, (NaPO₃)₆, (NaPO₃)₉ and Na₅P₃O₁₀ was bought from Sigma-Aldrich. KMnO₄ 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 ¹³C 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]

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

Scheme S1. Synthesis of Probe 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 Na₅P₃O₁₀ at different concentrations (0–500 nm).
Fig. S3  Changes in the emission spectrum of probe 1 (1 μM) upon the addition of (NaPO₃)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$_2$CO$_3$ (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$_2$SO$_4$ (4.2 μM), (NaPO$_3$)$_6$ (700 nM), ACP (100 μunits / mL).
Fig. S7  The influence of ClO₄⁻ on detection of ACP using our method. Probe 1 (1 μM), NaClO₄ (4.2 μM), (NaPO₃)₆ (700 nM), ACP (100 μunits / mL).
References: