Supplementary Material (ESI) for Organic & Biomolecular Chemistry

Electronic Supplementary Information (ESI)

for

A highly selective ratiometric fluorescent probe for 1,4-dithiothreitol (DTT) detection

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Table of Contents

1. Determination of quantum yield

The quantum yields of probe **1** and **2** were determined according to the following equation:

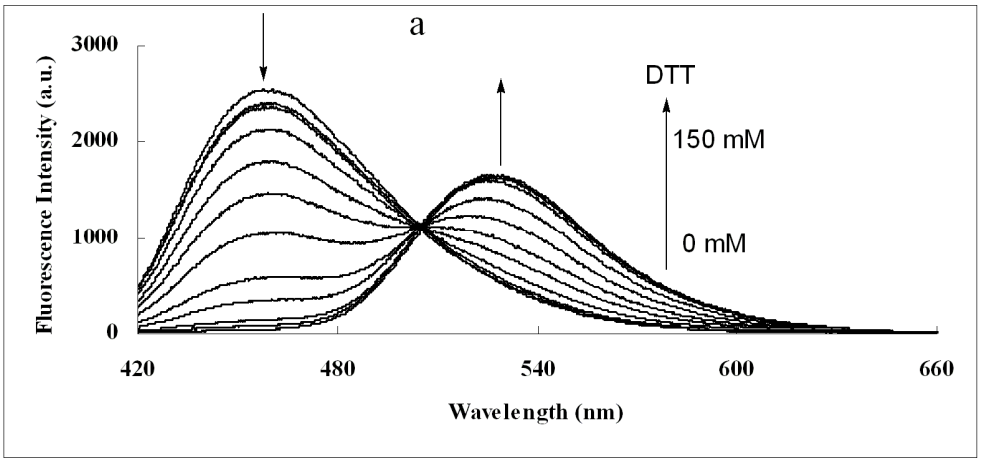
$$\phi_1 = \frac{\phi_B I_1 A_B \lambda_{exB} \eta_1}{I_B A_1 \lambda_{ex1} \eta_B}$$

Where Φ is quantum yield; I is integrated area under the corrected emission spectra; A is absorbance at the excitation wavelength; λ_{ex} is the excitation wavelength; η is the refractive index of the solution; the subscripts 1 and B refer to the unknown and the standard, respectively. *N*-butyl-4-butylamino-1,8-naphthalimide in absolute ethanol was used as the standard, which has a quantum yield of 0.810.[1]

2. Photos of color and fluorescence changes of 1 in the absence and presence of DTT

Fig. S1 Color (a) and Fluorescence (excited by UV lamp (ex. 365 nm)) (b) changes of **1** (5 μM) in PBS (20 mM) solution (ethanol/water = 1:1, v/v, pH 7.4) in the absence (left) and presence (right) of DTT (100 mM).

3. Fluorescence response of 1 toward different concentration of DTT



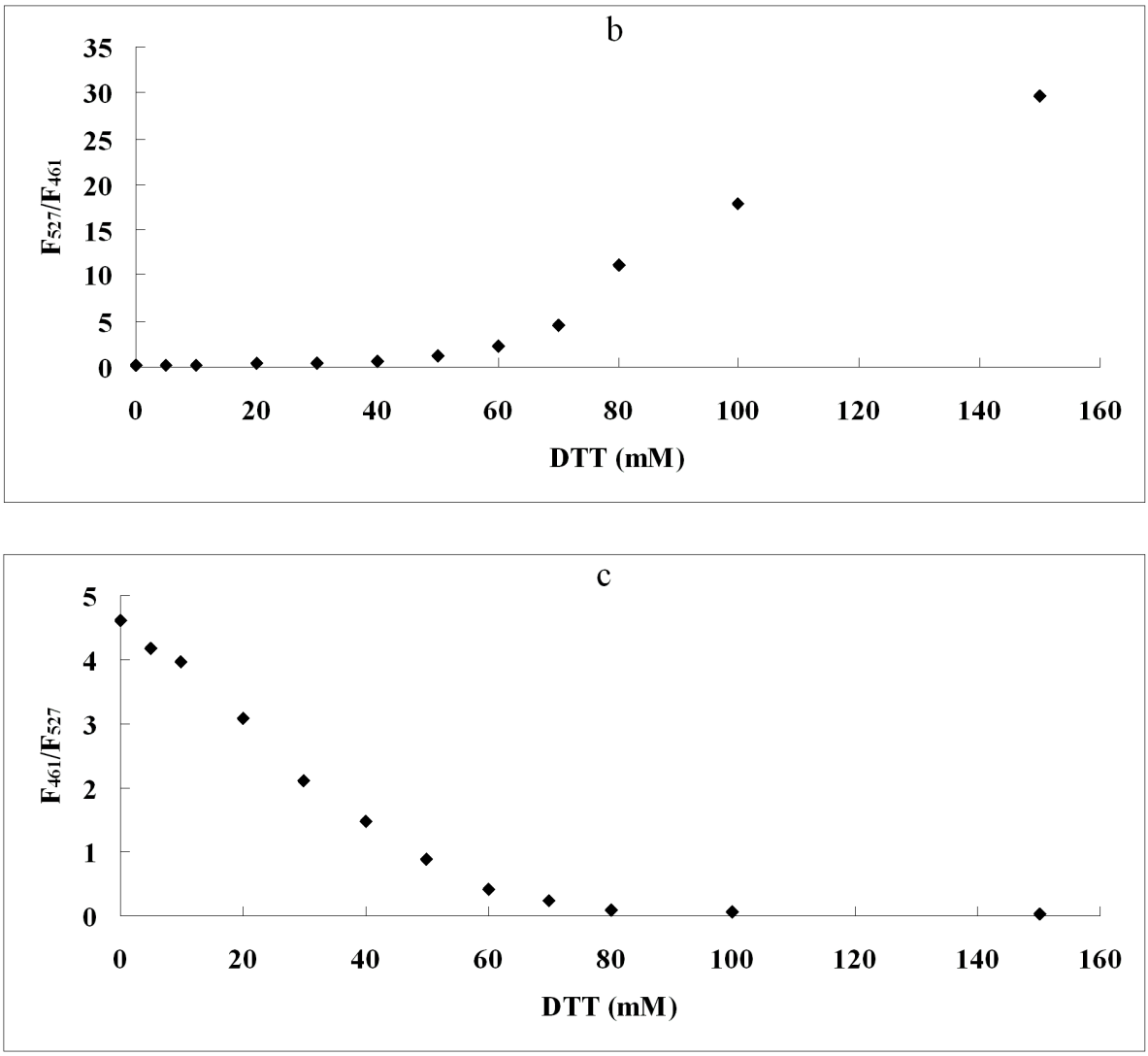
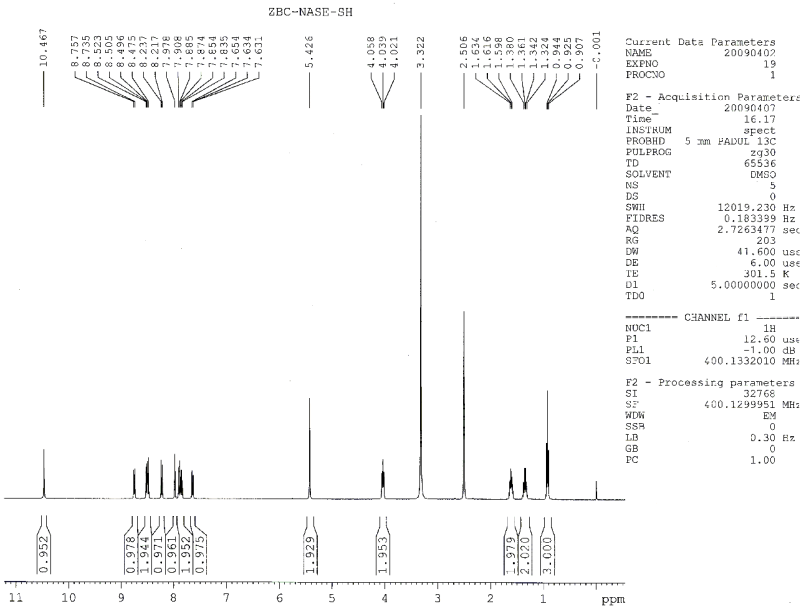


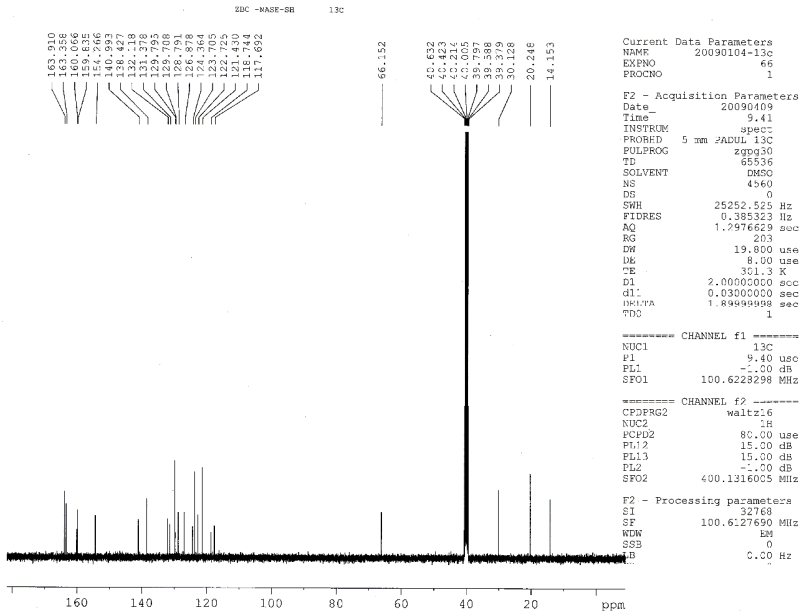
Fig. S2 Fluorescence response of **1** (5 μM) toward different concentration of DTT (final concentration: 0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 100, 150 mM) in PBS (20 mM) solution (ethanol/water = 1:1, v/v, pH 7.4). Excitation wavelength was 410 nm and excitation and emission slit widths were 2.5 nm and 5.0 nm. (a) Fluorescence spectra of **1** in the presence of increasing concentrations of DTT; (b) Fluorescence intensities ratio F_{527}/F_{461} of **1** and (c) Fluorescence intensities ratio F_{461}/F_{527} of **1** versus increasing concentrations of DTT.

4. The characterization data of probe 1

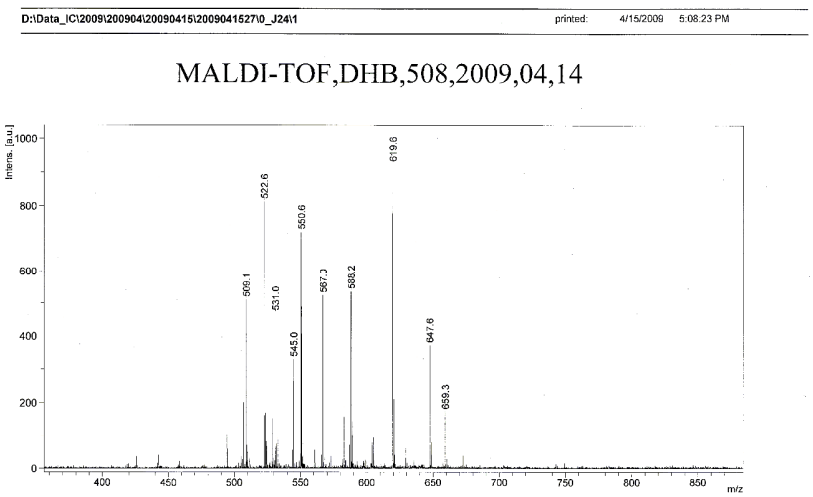
^{1}H NMR of probe **1**



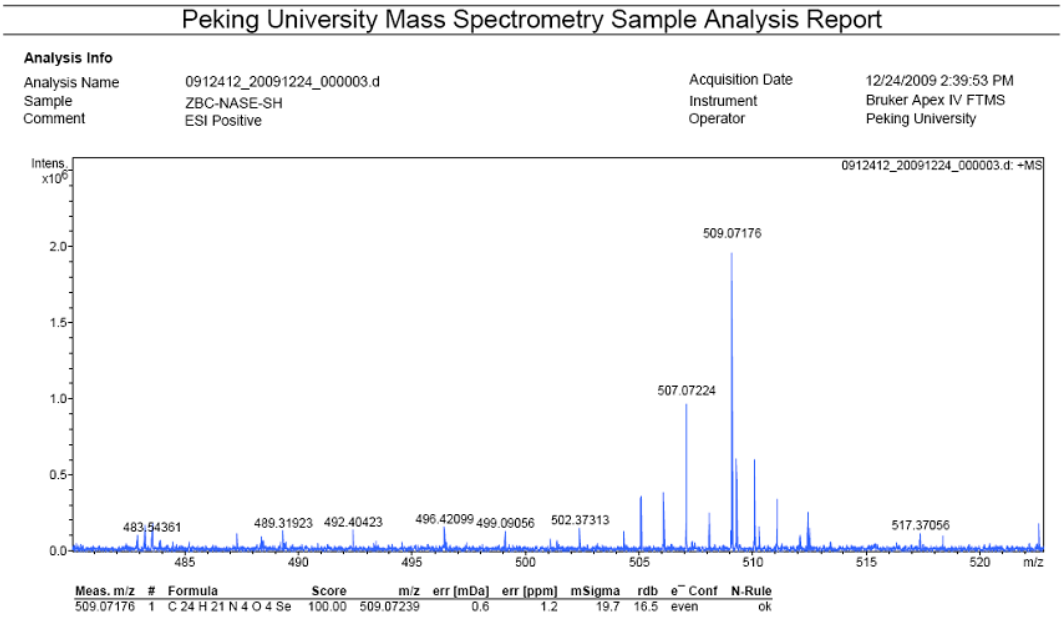
^{13}C NMR of probe **1**



MS spectrum of probe **1**



HRMS spectrum of probe **1**



5. References

1. M. S. Alexiou, V. Tychopoulos, S. Ghorbanian, J. H. P. Tyman, R. G. Brown and P. I. Brittain, *J. Chem. Soc., Perkin Trans. 2*, 1990, 837-842.