Supporting Information

A fluorescent probe for specific detection of cysteine and application in human serum

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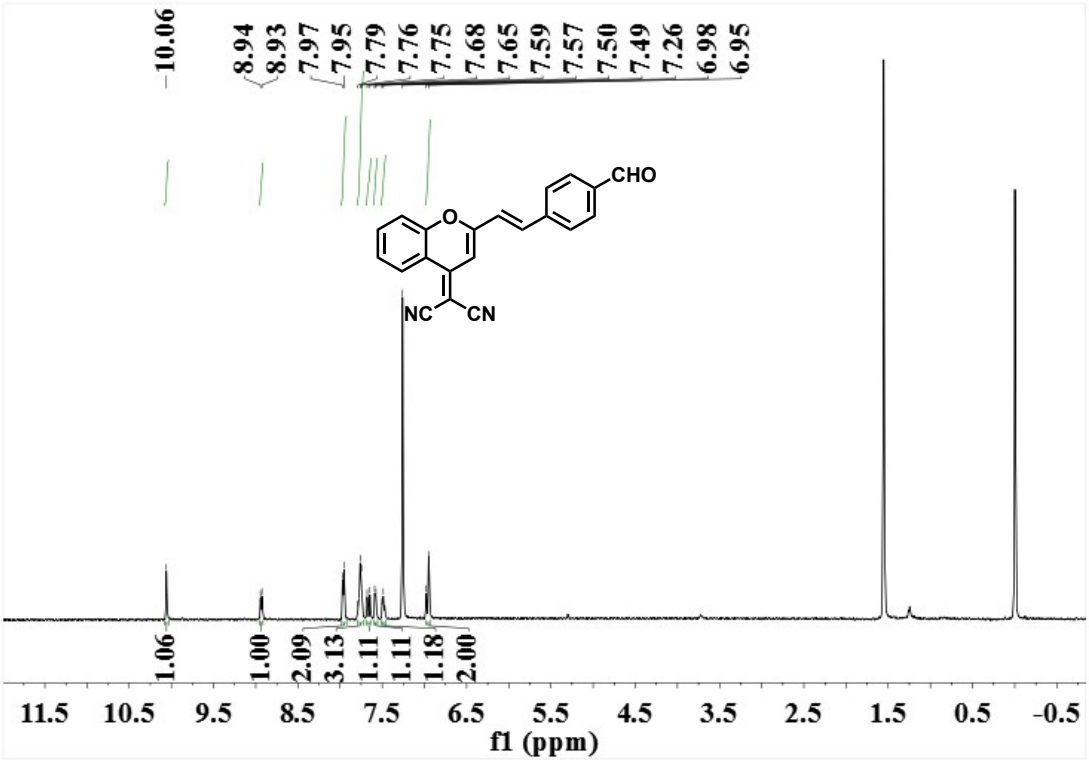

Fig. S1. ^{1}H NMR spectra of probe **1** in $CDCl_3$

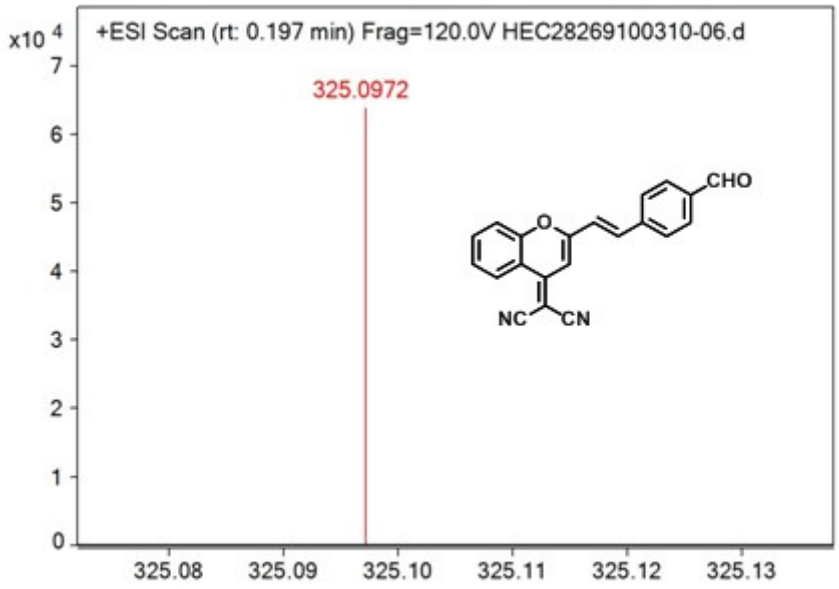

Fig. S2. HRMS spectrum of probe **1**.

Molar absorption coefficient

The molar absorption coefficients of probe 1 in the presence or abscence of Cys are calculated according to the formula ε = A/bc. Where ε is the molar absorption coefficient, A is the absorbance of free probe **1**, and probe **1** in the presence of 200 μM Cys, respectively (the absorbance at 355 nm is used in the paper to calculate ε), b is the thickness of the cuvette (1 cm^{-1}) and c is the solution concentration (10 μM).

Quantum yield measurements

Quinine sulfate in a 0.1 M H_2SO_4 aqueous solution (quantum yield is 0.54) as references. The QY_s were determined by comparing the integrated fluorescence intensity and the absorbance value of the probe **1** samples with those of the references. The absorbances (less than 0.05 at the excitation wavelength) at 355 nm for probe **1**, probe **1** and Cys response solution, and quinine sulfate were recorded, respectively. The slope method was used to calculate the QY_s using the equation:

$QY_u = QY_s (m_u/m_s) (n_u/n_s)$.

Where QY is the quantum yield, m is the slope determined by the curves. And n is the refractive index (1.33 for 0.1 M H_2SO_4 aqueous solution and 1.36 for anhydrous ethanol at room temperature). The subscript "s" refers to the standards and "u" refers to the unknown samples. A series of concentrations for the references and the required samples were measured to obtain the slopes.

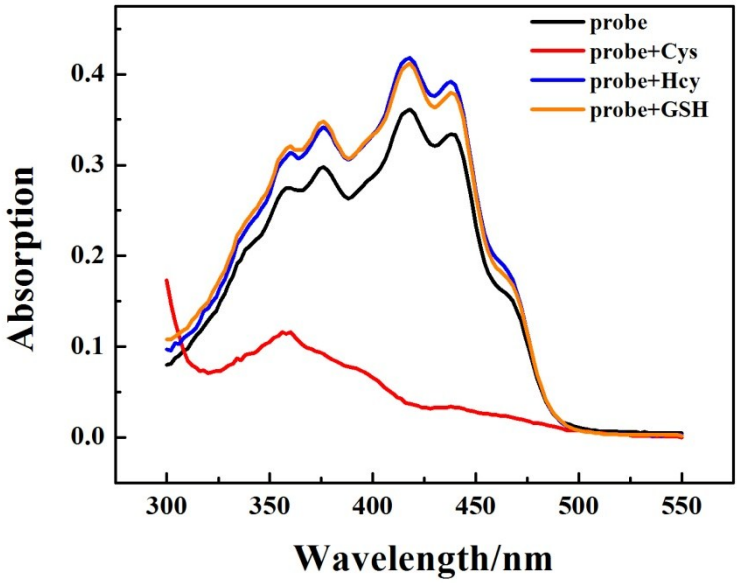

Fig. S3. Absorption spectra of probe (10 μM, black line) and the reaction mixture (red line, blue line and orange line) of 10 μM probe with 200 μM Cys，Hcy or GSH in DMF/phosphate buffer (1:1 v/v, 10 mM, pH 7.4) .

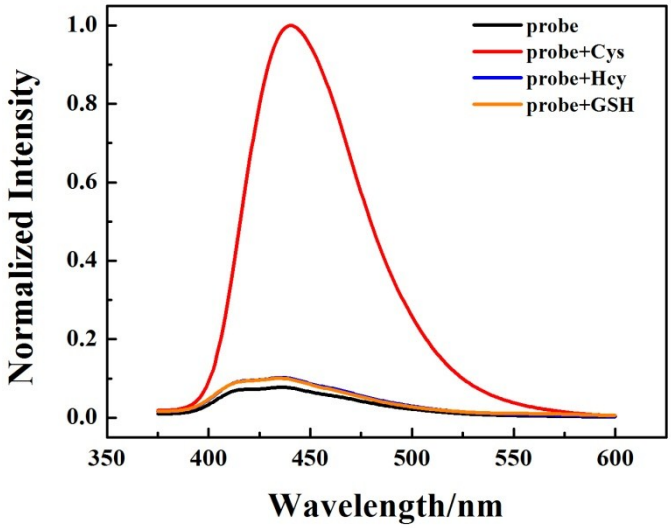

Fig. S4. Fluorescence spectra of probe (10 μM, black line) and the reaction mixture (red line, blue line and orange line) of 10 μM probe with 200 μM Cys，Hcy or GSH in DMF/phosphate buffer (1:1 v/v, 10 mM, pH 7.4) . λ_{ex} = 355 nm, Slits:5/5 nm.

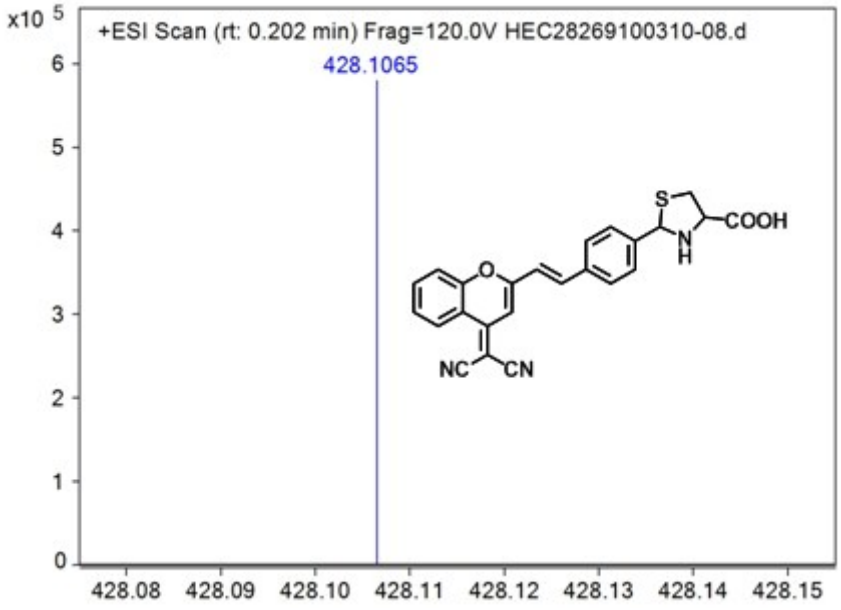

Fig. S5. HRMS spectrum of probe **1** and Cys reaction mixture.

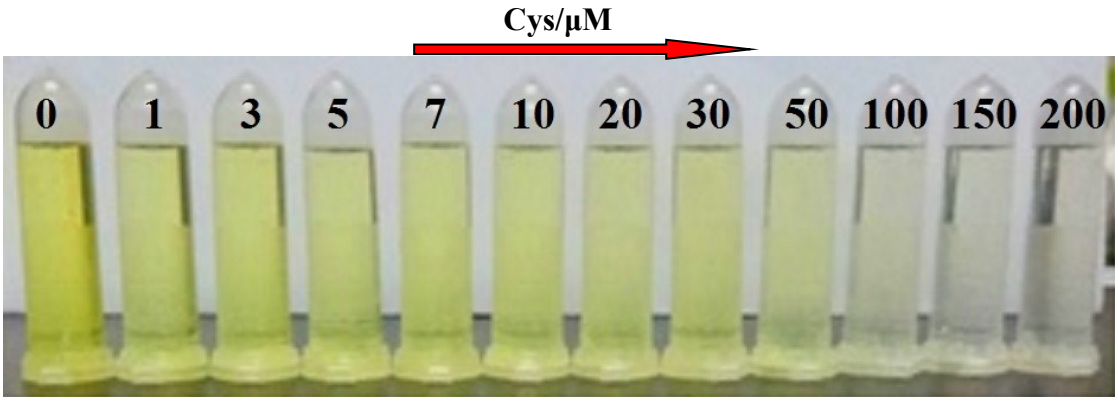

Fig. S6. The color changes of probe **1** (10 μM) upon addition of different concentrations of Cys in DMF/PBS buffer (1:1, v/v, 10 mM, pH 7.4).

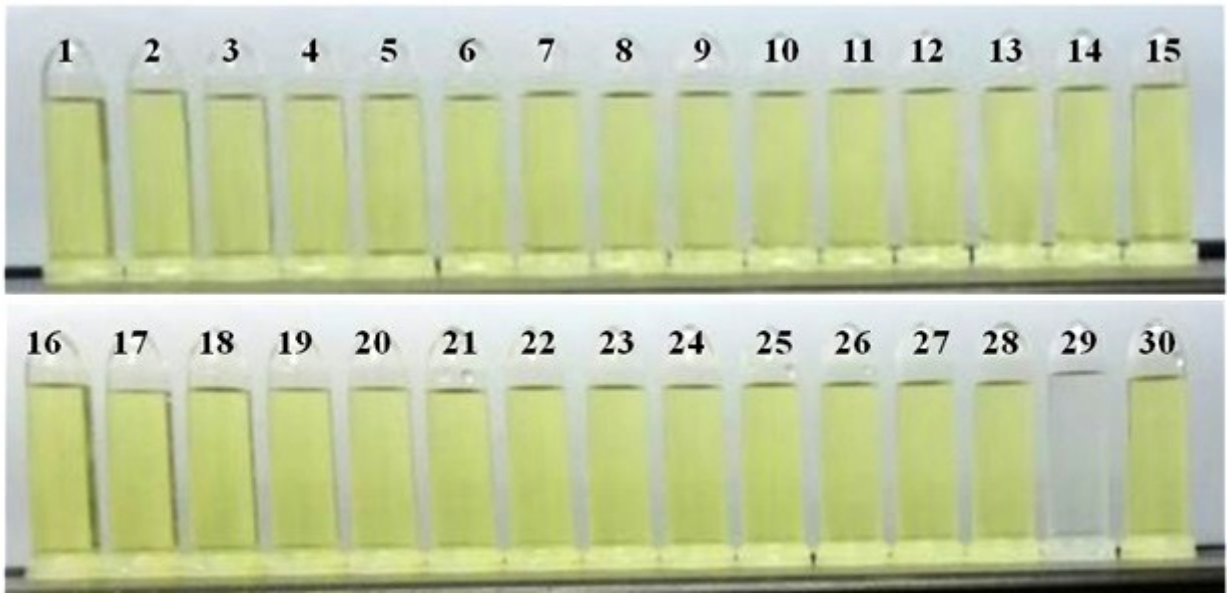

Fig. S7. The color changes of probe **1** (10 μM) with various analytes (200 μM). The pictures were recorded at 50 min after addition of the analytes 1-30 ($CaCl_2$, $MgCl_2$, $ZnCl_2$, $FeCl_2$, $FeCl_3$, $AlCl_3$, $MnCl_2$, VC, Glc, Fru, Gly, Ala, Met, Thr, Lys, Asp, Glu, Pro, Ser, NAC, Na_2SO_4, NaHS, EtSH, PhSH, *n*-$C_4H_9NH_2$, $PhNH_2$, Hcy, GSH, Cys, Blank.)