Electronic Supplementary information

*Ratiometric fluorescence probe for the selective detection of H2S in serum using pyrene-DPA-Cd2+ complex*

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Fluorescence spectra of pyrene-DPA complex with metal ions

![Fluorescence spectra of pyrene-DPA complex with various metal ions (Cd$^{2+}$, Zn$^{2+}$, Cu$^{2+}$, and Hg$^{2+}$) in buffer solution (HEPES, 20 mM, pH 7.4). [pyrene-DPA] = 20 µM, [metal ion] = 20 µM, $\lambda_{ex}$ = 341 nm.](image)

**Figure S1** Fluorescence spectra of pyrene-DPA complex with various metal ions (Cd$^{2+}$, Zn$^{2+}$, Cu$^{2+}$, and Hg$^{2+}$) in buffer solution (HEPES, 20 mM, pH 7.4). [pyrene-DPA] = 20 µM, [metal ion] = 20 µM, $\lambda_{ex}$ = 341 nm.
Fluorescence change of pyrene-DPA-Cd$^{2+}$ or Zn$^{2+}$ complex with PPI

**Figure S2** Fluorescence change in excimer against monomer emission of pyrene-DPA-Cd$^{2+}$ or Zn$^{2+}$ complex with PPI (50 µM) in the buffer solution (HEPES, 20 mM, pH 7.4), $\lambda_{ex} = 341$ nm.
**H₂S and Cys detection in different pH condition**

**Figure S3** Fluorescence change of pyrene-DPA-Cd²⁺ complex with H₂S and Cys in different buffer solutions (20 mM). [pyrene-DPA-Cd²⁺ complex] = 20 µM, [H₂S] = 60 µM, [Cys] = 60 µM, pH 5.0: Acetate, pH 6.0: MES, pH 7.0, 7.4, and 8.0: HEPES, pH 9.0: Tris, λ<sub>ex</sub> = 341 nm.
Response time for detection of $\text{H}_2\text{S}$ by pyrene-DPA-Cd$^{2+}$ complex

![Plot of Fluorescence change of pyrene-DPA-Cd$^{2+}$ complex with various concentrations of $\text{H}_2\text{S}$ along with time in buffer solution (HEPES, 20 mM, pH 7.0). [pyrene-DPA-Cd$^{2+}$ complex] = 20 $\mu$M, [H$_2$S] = 0.0, 0.5, 1.0, 5.0, 10.0, 20.0, 30.0, 40.0, 50.0 $\mu$M, $\lambda_{ex} = 341$ nm.]

**Figure S4** Plot of Fluorescence change of pyrene-DPA-Cd$^{2+}$ complex with various concentrations of $\text{H}_2\text{S}$ along with time in buffer solution (HEPES, 20 mM, pH 7.0). [pyrene-DPA-Cd$^{2+}$ complex] = 20 $\mu$M, [H$_2$S] = 0.0, 0.5, 1.0, 5.0, 10.0, 20.0, 30.0, 40.0, 50.0 $\mu$M, $\lambda_{ex} = 341$ nm.
Estimated limit of detection (LOD) for H$_2$S detection

**Figure S5** Plot of change of fluorescence ratio at 476 nm and 376 nm against H$_2$S concentrations (0, 0.1, 0.4, 0.6, 0.8, and 1.0 µM), $\lambda_{ex}$ = 341 nm.

Stdev. of blank ($\sigma$) = 0.00188

Slope (S) = 0.08036

$R^2$ = 0.9948

Limit of detection (LOD) = 70.18 nM from 3$\sigma$/S