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**Electronic Supplementary information**

# *Ratiometric fluorescence probe for the selective detection of $H_2S$ in serum using pyrene-DPA-$Cd^{2+}$ complex*

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## Fluorescence spectra of pyrene-DPA complex with metal ions

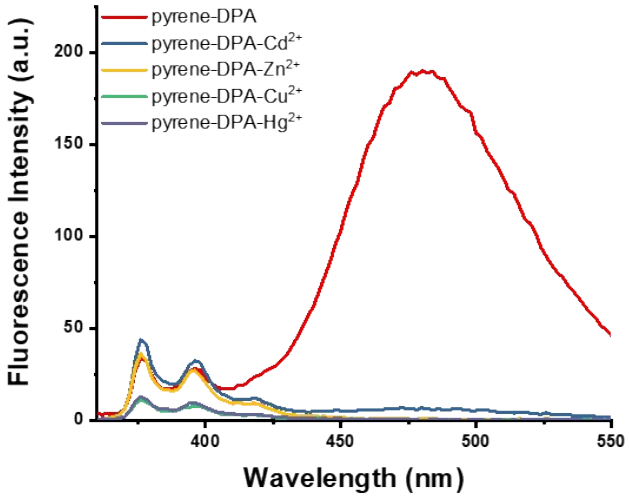


**Figure S1** Fluorescence spectra of pyrene-DPA complex with various metal ions ($Cd^{2+}$, $Zn^{2+}$, $Cu^{2+}$, and $Hg^{2+}$) in buffer solution (HEPES, 20 mM, pH 7.4). [pyrene-DPA] = 20 μM, [metal ion] = 20 μM, $\lambda_{ex}$ = 341 nm.

## Fluorescence change of pyrene-DPA-$Cd^{2+}$ or $Zn^{2+}$ complex with PPi

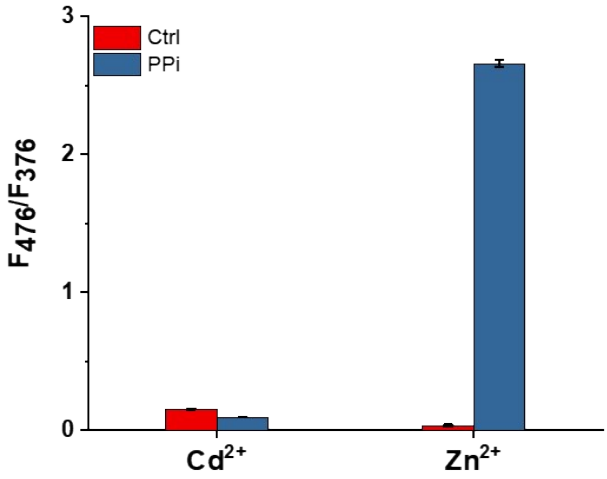


**Figure S2** Fluorescence change in excimer against monomer emission of pyrene-DPA-$Cd^{2+}$ or $Zn^{2+}$ complex with PPi (50 μM) in the buffer solution (HEPES, 20 mM, pH 7.4), $\lambda_{ex}$ = 341 nm.

## $H_2S$ and Cys detection in different pH condition

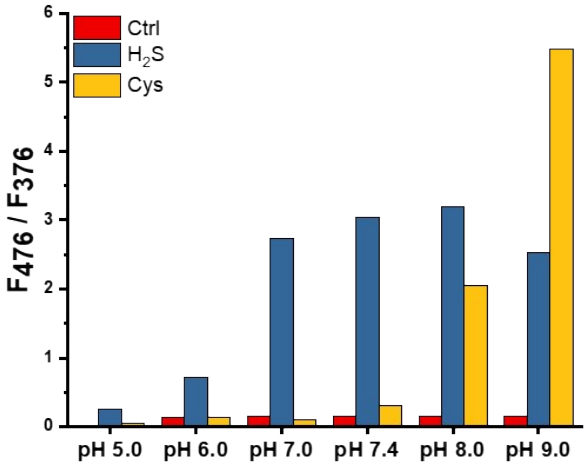


**Figure S3** Fluorescence change of pyrene-DPA-$Cd^{2+}$ complex with $H_2S$ and Cys in different buffer solutions (20 mM). [pyrene-DPA-$Cd^{2+}$ complex] = 20 μM, [$H_2S$] = 60 μM, [Cys] = 60 μM, pH 5.0: Acetate, pH 6.0: MES, pH 7.0, 7.4, and 8.0: HEPES, pH 9.0: Tris, $\lambda_{ex}$ = 341 nm.

## Response time for detection of $H_2S$ by pyrene-DPA-$Cd^{2+}$ complex

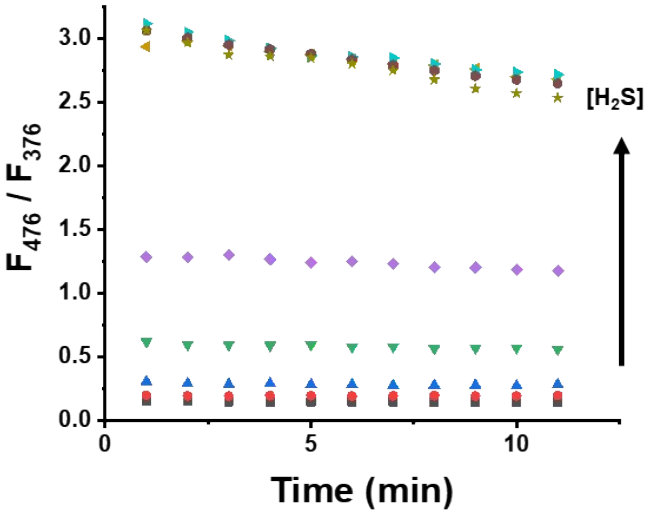


**Figure S4** Plot of Fluorescence change of pyrene-DPA-$Cd^{2+}$ complex with various concentrations of $H_2S$ along with time in buffer solution (HEPES, 20 mM, pH 7.0). [pyrene-DPA-$Cd^{2+}$ complex] = 20 μM, [$H_2S$] = 0.0, 0.5, 1.0, 5.0, 10.0, 20.0, 30.0, 40.0, 50.0 μM, $\lambda_{ex}$ = 341 nm.

## Estimated limit of detection (LOD) for $H_2S$ detection

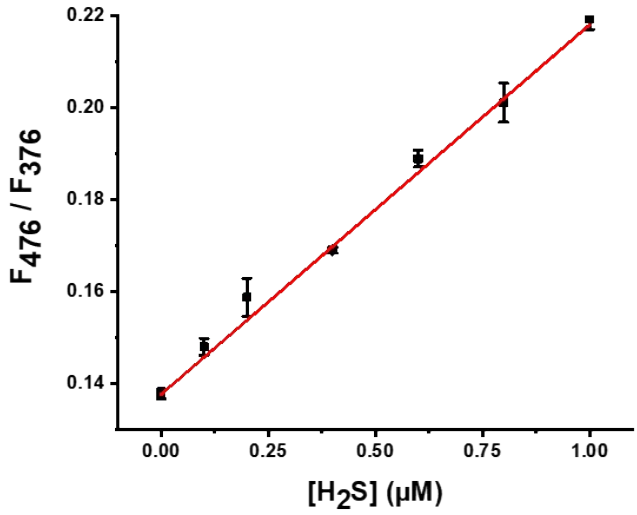


**Figure S5** Plot of change of fluorescence ratio at 476 nm and 376 nm against $H_2S$ concentrations (0, 0.1, 0.4, 0.6, 0.8, and 1.0 μM), $\lambda_{ex}$ = 341 nm.

Stdev. of blank (σ) = 0.00188

Slope (S) = 0.08036

$R^2$ = 0.9948

Limit of detection (LOD) = 70.18 nM from 3σ/S