Supporting Information

A novel histidine functionalized 1,8-naphthalimide-based fluorescent chemosensor for selective and sensitive detection of $\text{Hg}^{2+}$ in water

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Table of Contents

1. Fig. S1. $^1$HNMR spectrum of $Z_1$ in DMSO-d$_6$.

2. Fig. S2. $^{13}$C NMR spectrum of $Z_1$ in DMSO-d$_6$.

3. Fig. S3. ESI-MS spectrum of $Z_1$.

4. Fig. S4. (a) Fluorescence emission data for a 1:10 mixture of $Z$ (2.0×10$^{-5}$ M) and different metal ions, as their perchlorate salts, in water ($\lambda_{ex}$=343 nm). (b) Visual fluorescence emissions of sensor $Z$ after the addition of various metal ions (10 equiv.) in water on excitation at 384 nm using UV lamp.

5. Fig. S5. A plot of fluorescence intensity of the sensor $Z$ (2.0×10$^{-5}$ M, water solution) depending on the concentration of Hg$^{2+}$ in the range from 0 to 8 equivalents.

6. Figure. S6. Non-linear least square fitting of intensity vs concentration of Hg$^{2+}$ using 1:1 complex model.

7. Fig. S7. Determination of detection limit of Hg$^{2+}$.

8. Figure S8 Influence of pH on the fluorescence of $Z$ and $Z$+Hg$^{2+}$ in HEPES buffered solution in water.

9. Fig. S9 Partial $^1$H NMR spectra of $Z$ (0.05 M, D$_2$O), and $Z$ in the presence of varying amounts of Hg$^{2+}$.

10. Fig. S10. ESI-MS spectrum of $Z$+Hg$^{2+}$ complex.
Fig. S1 $^1$HNMR spectrum of $Z_1$ in DMSO-d$_6$. 
Fig. S2 $^{13}$C NMR spectrum of $Z_1$ in DMSO-d$_6$. 
Figure S3 ESI-MS spectrum of Z₁₅.
Figure S4 (a) Fluorescence emission data for a 1:10 mixture of Z (2.0×10⁻⁵ M) and different metal ions, as their perchlorate salts, in water (λex=343 nm). (b) Visual fluorescence emissions of sensor Z after the addition of various metal ions (10 equiv.) in water on excitation at 384 nm using UV lamp.
Fig. S5 A plot of fluorescence intensity of the sensor Z (2.0×10^{-5} M, water solution) depending on the concentration of Hg^{2+} in the range from 0 to 8 equivalents.
Figure S6 Non-linear least square fitting of intensity vs concentration of Hg$^{2+}$ using 1:1 complex model.
Figure S7 Plot of the intensity at 384 nm for a mixture of Z and Hg$^{2+}$ in water in the range $1.0 \times 10^{-7}$–$2.0 \times 10^{-6}$ M ($\lambda_{ex} = 343$ nm). Linear Equation: $Y = -102.950X + 536.227$, $R^2 = 0.9903$

\[ \delta = \sqrt{\frac{\sum(F_0 - F_1)^2}{N - 1}} = 6.069, \; K = 3 \]

\[ S = 1.03 \times 10^6 \]

\[ LOD = K \times \delta / S \]

\[ LOD = 1.785 \times 10^{-7} \text{ M} \]

$F_0$ is the fluorescence intensity of Z; $F_1$ is the average of the $F_0$. 
Figure S8 Influence of pH on the fluorescence of Z and Z+Hg$^{2+}$ in HEPES buffered solution in water.
Fig. S9 Partial $^1$H NMR spectra of $Z$ (0.05 M, D$_2$O), and $Z$ in the presence of varying amounts of Hg$^{2+}$. 
**Measurement of fluorescence quantum yields**

Fluorescence quantum yields were determined by the following equation.

\[ \Phi = \Phi_R \times \frac{I}{I_R} \frac{A_R}{A} \]

Where \( \Phi \) is fluorescence quantum yield, \( I \) is the integrated fluorescence intensity and \( A \) is the optical density (absorption). The subscript \( R \) refers to the reference of Quinine hemesulfate salt.”
Figure S10 ESI-MS spectrum of Z+Hg\textsuperscript{2+} complex.