Supporting Information

for the manuscript entitled

Transition metal induced switch of fluorescence and absorption responses of Zn(II)porphyrin-DNA conjugate to cysteine derivatives

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ESI: Table of Contents

Figure S1: UV-vis absorption and emission spectra of ZnPorT8 titrated with Cys ........ S3
Figure S2: UV-vis absorption and emission spectra of ZnPorT8 titrated with GSH ........ S3
Figure S3: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (3.0 μM Hg$^{2+}$) titrated with Cys ........ S4
Figure S4: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (4.0 μM Hg$^{2+}$) titrated with Cys ........ S4
Figure S5: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with L-Cys ........ S5
Figure S6: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with D-Cys ........ S5
Figure S7: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with GSH ........ S6
Figure S8: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Ala ........ S6
Figure S9: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Arg ........ S7
Figure S10: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Asn ........ S7
Figure S11: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Gln ........ S8
Figure S12: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Gla ........ S8
Figure S13: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Gly ........ S9
Figure S14: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with His ........ S9
Figure S15: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Ile ........ S10
Figure S16: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Leu ........ S10
Figure S17: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Lys ........ S11
Figure S18: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Met ........ S11
Figure S19: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Pro ........ S12
Figure S20: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Phe ........ S12
Figure S21: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Ser ........ S13
Figure S22: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Thr ........ S13
Figure S23: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Tyr ........ S14
Figure S24: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Trp ........ S14
Figure S25: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with Val ........ S15
Figure S26: UV-vis absorption and emission spectra of ZnPorT8/Cu$^{2+}$ complex (20.0 μM Cu$^{2+}$) titrated with Cys ........ S15
Figure S27: UV-vis absorption and emission spectra of ZnPorT8/Cu$^{2+}$ complex (20.0 μM Cu$^{2+}$) titrated with GSH ........ S16
Figure S28: UV-vis absorption changes of ZnPorT8/Cu$^{2+}$ complex (20.0 μM Cu$^{2+}$) vs. conc. of GSH ........ S17
Figure S29: UV-vis absorption changes of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) vs. conc. of GSH ........ S17
Figure S30: Changes of fluorescence intensity of the ZnPorT8/Hg$^{2+}$ systems at 654.0 nm as a function of the L-Cys concentration for different Hg$^{2+}$ concentrations ........ S17
Figure S31: Competitive sensing: UV-vis absorption and emission spectra of ZnPorT8/Hg$^{2+}$ complex (5.0 μM Hg$^{2+}$) titrated with a mixture of amino acids ........ S18
Table S1. Relative fluorescence quantum yields. ........ S18
Figure S1. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8 (2μM) upon stepwise addition of the cysteine (Cys) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S2. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8 (2μM) upon stepwise addition of the glutathione (GSH) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
**Figure S3.** UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 3.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the cysteine (Cys) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

**Figure S4.** UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 4.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the cysteine (Cys) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S5. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the L-cysteine (L-Cys) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S6. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the D-cysteine (D-Cys) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S7. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg²⁺ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg²⁺ ion) upon stepwise addition of the Glutathione (GSH) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S8. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg²⁺ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg²⁺ ion) upon stepwise addition of the alanine (Ala) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S9. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the arginine (Arg) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S10. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the aspartic acid (Asn) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S11. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg^{2+} complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg^{2+} ion) upon stepwise addition of the glutamic acid (Gln) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S12. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg^{2+} complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg^{2+} ion) upon stepwise addition of the glutamine (Glu) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
**Figure S13.** UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the glycine (Gly) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

**Figure S14.** UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the Histidine (His) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S15. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the iso-leucine (Ile) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S16. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the leucine (Leu) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S17. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the lysine (Lys) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S18. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the methionine (Met) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S19. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg^{2+} complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg^{2+} ion) upon stepwise addition of the proline (Pro) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S20. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg^{2+} complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg^{2+} ion) upon stepwise addition of the phenylalanine (Phe) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S21. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg²⁺ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg²⁺ ion) upon stepwise addition of the serine (Ser) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S22. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg²⁺ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg²⁺ ion) upon stepwise addition of the threonine (Thr) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S23. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg\textsuperscript{2+} complex (2.0 \(\mu\)M of ZnPorT8 and 5.0 \(\mu\)M of Hg\textsuperscript{2+} ion) upon stepwise addition of the tyrosine (Tyr) from 5 to 30 \(\mu\)M in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S24. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg\textsuperscript{2+} complex (2.0 \(\mu\)M of ZnPorT8 and 5.0 \(\mu\)M of Hg\textsuperscript{2+} ion) upon stepwise addition of the tryptophan (Trp) from 5 to 30 \(\mu\)M in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S25. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Hg$^{2+}$ complex (2.0 μM of ZnPorT8 and 5.0 μM of Hg$^{2+}$ ion) upon stepwise addition of the valine (Val) from 5 to 30 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S26. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Cu$^{2+}$ complex (2.0 μM of ZnPorT8 and 20.0 μM of Cu$^{2+}$ ion) upon stepwise addition of the cysteine (Cys) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).
Figure S27. UV-vis absorption (left) and emission (right) spectra of the ZnPorT8/Cu$^{2+}$ complex (2.0 μM of ZnPorT8 and 20.0 μM of Cu$^{2+}$ ion) upon stepwise addition of the Glutathione (GSH) from 1 to 10 μM in Na-cacodylate buffer (1 mM, pH = 7.0, 20 °C).

Figure S28. UV-vis absorption changes of the ZnPorT8/Cu$^{2+}$ complex at 425.0 nm as a function of the GSH concentration (A-A$_0$, A$_0$: absorbance of ZnPorT8/Cu$^{2+}$, A: absorbance of ZnPorT8/Cu$^{2+}$ after addition of GSH).
Figure S29. UV-vis absorption changes of the ZnPorT8/Hg^{2+} complex at 425.0 nm as a function of the GSH concentration (A-A_0, A_0: absorbance of ZnPorT8/Hg^{2+}, A: absorbance of ZnPorT8/Hg^{2+} after addition of GSH).

Figure S30. (a) Changes of fluorescence intensity of the ZnPorT8/Hg^{2+} systems ([ZnPorT8] = 2.0 μM, [Hg^{2+}] = 2.0 μM: blue line, 3.0 μM: green line, 4.0 μM: black line, 5.0 μM: red line, and 6.0 μM: orange line) at 654.0 nm as a function of the L-Cys concentration (0 to 10.0 μM in 1.0 μM addition steps). (b) Fluorescence intensity changes of the ZnPorT8/Hg^{2+} systems as a function of the L-Cys concentration (0 to 5.0 μM) detected at 654.0 nm and their linear fits (colored lines, F-F_0, F_0: fluorescence intensity of ZnPorT8/Hg^{2+}, F: fluorescence intensity ZnPorT8/Hg^{2+} after addition of L-Cys).
**Figure S31.** a) UV/Vis absorption and b) emission ($\lambda_{\text{exc}} = 425$ nm) spectra of the ZnPorT8/Hg$^{2+}$ complex (black curve, [ZnPorT8] = 2.0 μM, [Hg$^{2+}$] = 5.0 μM) in the presence of an amino acid mixture (Ala, Lys, Met, Pro and Trp; each 5.0 μM) with 5.0 μM L-Cys (red curve) and without L-Cys (green dashed curve).

**Table S1.** Relative fluorescence quantum yields of ZnPorT8, ZnPorT8/Hg(II), and ZnPorT8/Cu(II).

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