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SUPPORTING INFORMATION

Figure S1. Photographs of B in DMSO (5 mL, 2 x 10^-4 M) upon addition of 0.5 mL of H_2O or aqueous solutions of every metal ion (0.01 M for Hg^{2+}, Ca^{2+} and 0.1 M, for the rest of the cations).

Figure S2. Lower picture: photographs of B (1 mL, 2 x 10^-5 M in DMSO) after addition of 3 mL of aqueous solutions of Hg^{2+} with different concentrations. Upper picture: photographs of these solutions irradiated with UV light at λ = 365 nm.
Figure S3. Lower picture: Photographs of dried test strips of A (DMSO, $2 \times 10^{-4}$ M) after immersion in water and aqueous solutions of Hg$^{2+}$ with different concentrations.

Upper picture: photographs of these test strips irradiated with UV light at $\lambda = 365$ nm.

Figure S4. Absorption spectra of B in DMSO ($5 \text{ mL}, 2 \times 10^{-4} \text{ M}$) upon the addition of
0.5 mL of water or aqueous solutions of every metal ion (0.01 M for Hg$^{2+}$, Ca$^{2+}$ and 0.1 M, for the rest of the cations).

Figure S5. Absorption response of B in DMSO (5 mL, $2 \times 10^{-4}$ M) to the presence of several metal ions (0.5 mL, 0.1 M in H$_2$O) with (0.5 mL, 0.01 M in H$_2$O) and without Hg$^{2+}$. 
Figure S6. Changes in the UV-Vis absorption spectra of A in DMSO (3 mL, 10^{-4} M) upon addition of Hg^{2+} (n x 10\mu L, 3 x 10^{-3} M; 0-5 A:Hg^{2+} molar ratio) in buffer aqueous solution (HEPES, 20mM, pH = 7.0). Inset: a) Titration curve of A with Hg^{2+} b) Job’s plot for determining the stoichiometry of the complex [A-Hg^{2+}]^+ in DMSO / H_2O (1:0.1, v/v).
Figure S7. Reversible Hg$^{2+}$ complexation to B by addition of KI followed by luminescence. Inset: Orange line, free B (2 x $10^{-4}$M, DMSO); violet line: B + Hg$^{2+}$ (1:1); grey line: B + Hg$^{2+}$ + KI (1:1:2).

Table S1. Emission lifetimes of mixtures A/ Hg$^{2+}$ (DMSO/H$_2$O).

<table>
<thead>
<tr>
<th>[Hg$^{2+}$]/[A]</th>
<th>0</th>
<th>0.2</th>
<th>0.4</th>
<th>0.6</th>
<th>0.8</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\tau$ (ns)</td>
<td>25.2</td>
<td>27.7</td>
<td>26.4</td>
<td>26.7</td>
<td>26.8</td>
<td>27.3</td>
</tr>
</tbody>
</table>
Figure S8: Stern-Volmer plot for the titration of: a) A in DMSO (3 mL, $10^{-4}$ M) with Hg$^{2+}$; b) B in DMSO (3 mL, $10^{-4}$ M) with Hg$^{2+}$. 
Figure S9. Luminescence response of B (5 mL, 2 \times 10^{-4} M in DMSO) to the presence of several metal ions (0.5 mL, 0.1 M in H₂O) before and after addition of Hg^{2+} (0.5 mL, 0.01 M in H₂O). Inset: emission intensity of B (\lambda_{exc} = 510 \text{ nm}) in DMSO, B+Hg^{2+} and B+Hg^{2+}+Ag^{+}
Figure S10. Molecular structure of the adduct $\text{B: } 2\text{Ag}^+$ based on single crystal data from poorly diffracting crystals.
Figure S11. Comparison of the experimental absorption spectrum of A: Hg^{2+} (1:5) in
DMSO/H₂O (black line) with the $^1$MMLCT absorption of A (blue bar) and the low-energy calculated absorption frequencies (red bars) of the different proposed structures.