Electronic Supplementary Information

Solvent assisted selective detection of sub-micromolar levels of Cu$^{2+}$ ions in aqueous samples and live-cells

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**Fig. S2.** $^{13}$C NMR spectrum of 1 in DMSO-$d_6$
Fig. S3. ESI Mass spectrum of 1
Fig. S4. $^1$H NMR spectrum of 2 in CDCl$_3$
**Fig. S5.** $^{13}$C NMR spectrum of 2 in CDCl$_3$
Fig. S6. ESI Mass spectrum of 2
**Fig. S7.** Metal-ion selectivity of 2 (10 µM) in 1:1 v/v 0.01M Tris HCl-CH₃CN, pH 7.4. The dark bars represent the fluorescence emission of a solution of 2 (10 µM) and 5 equiv of the cation of interest. The light bars show the fluorescence change that occurs upon addition of 1 equiv of Cu(II) to the solution containing 2 (10 µM) and the cation (50 µM).
Fig. S8. The linear range of detection using fluorescent probe 2
Fig. S9. ESI Mass spectrum of 2-Cu\(^{2+}\) complex
Fig. S10. pH dependant variation in fluorescence intensity of 2 (10 μM).
**Fig. S11.** Cu$^{2+}$ ion selectivity of 2 (10 µM) in 1:1v/v 0.01M Tris HCl-CH$_3$CN, pH 7.4 in the presence of various amino acids. The dark bars represent the fluorescence emission intensity of 2 (10 µM) and 5 equiv of the amino acid of interest. The grey bars show the fluorescence emission intensity upon addition of 1.0 equiv. of Cu$^{2+}$ to the solution of 2 (10 µM) and 5.0 equiv. of the amino acid of interest.
### Table S1. Comparative account of the characteristics of probe 2 and other Cu$^{2+}$ probes

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<th>Cu$^{2+}$ Sensor</th>
<th>Reversibility</th>
<th>Competing metal ion(s)</th>
<th>Linear range (µM)</th>
<th>Detection limit (µM)</th>
<th>Remarks</th>
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<tr>
<td>Ref 1</td>
<td>NA</td>
<td>Co$^{2+}$</td>
<td>0.1-70</td>
<td>0.23</td>
<td>Interference from other metal ions</td>
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<tr>
<td>Ref 2</td>
<td>Irreversible</td>
<td>-</td>
<td>2.5-35</td>
<td>1.8</td>
<td>Large response time (8 min) and high detection limit</td>
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<tr>
<td>Ref 3</td>
<td>Reversible</td>
<td>-</td>
<td>0.1-1</td>
<td>0.045</td>
<td>narrow linear range of detection</td>
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<tr>
<td>Ref 4</td>
<td>Irreversible</td>
<td>-</td>
<td>0.08-30</td>
<td>0.013</td>
<td>Low excitation wavelength (365 nm) may be harmful to living organisms</td>
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<tr>
<td>Ref 5</td>
<td>Irreversible</td>
<td>Cr$^{3+}$, Hg$^{2+}$</td>
<td>-</td>
<td>0.3</td>
<td>Interference from other metal ions</td>
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<tr>
<td>Ref 6</td>
<td>NA</td>
<td>Fe$^{3+}$, Hg$^{2+}$</td>
<td>-</td>
<td>-</td>
<td>Interference from other metal ions</td>
</tr>
<tr>
<td>This work</td>
<td>Reversible</td>
<td>-</td>
<td>0.05-8</td>
<td>0.03</td>
<td>No interference from other metal ions; Wide linear range of detection; Low detection limit; Excitation in visible region (525 nm)</td>
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### References