Supporting Information

A rhodamine derivative probe for highly selective detection of Cu(II)

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1. Experimental conditions

All reagents used are obtained from commercial procurement channels and can be used directly without purification. Different test interference ion solutions were prepared from different chloride salts such as HgCl₂, KCl, CdCl₂, NaCl, BaCl₂, AlCl₃, CoCl₂, MgCl₂, CaCl₂, PbCl₂, FeCl₂, MnCl₂, FeCl₃, ZnCl₂, and NiCl₂. Use dimethyl sulfoxide (DMSO) to prepare a 10 mM probe stock solution, which is diluted with PBS (pH=7.4) buffer solution during the test. The copper ions used in the spectroscopy experiments are all from CuSO₄, and distilled deionized water is used throughout the experiment.

2. Supplementary Table 1. Fluorescent probes for Cu²⁺ detection.

<table>
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<tr>
<th>Probe</th>
<th>λ_ex</th>
<th>λ_em</th>
<th>Detection limit</th>
<th>Imaging applications</th>
<th>Reaction type</th>
<th>Literature</th>
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<td>Excitation (nm)</td>
<td>Concentration (μM)</td>
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<td>Primary human fibroblast cells</td>
<td>Coordination</td>
<td>[8]</td>
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</table>
3. Spectral Characterization

**Supplementary Fig. 1.** The HRMS spectrum of EtRh-N-NH2 after adding Cu(II) compound.

**Supplementary Fig. 2.** The fluorescence intensity increase after adding Cu(II) (30 μM) to EtRh-N-NH2 (10 μM) in 30 min.
Supplementary Fig. 3. $^1$H NMR spectrum of compound 2 in CDCl$_3$.

Supplementary Fig. 4. $^{13}$C NMR spectrum of compound 2 in CDCl$_3$. 
Supplementary Fig. 5. The HRMS spectrum of compound 2.

Supplementary Fig. 6. $^1$H NMR spectrum of compound EtRh-COOH in DMSO.
Supplementary Fig. 7. $^{13}$C NMR spectrum of compound EtRh-COOH in DMSO.

Supplementary Fig. 8. The HRMS spectrum of compound EtRh-COOH.
Supplementary Fig. 9. $^1$H NMR spectrum of compound EtRh-N-NH$_2$ in CDCl$_3$.

Supplementary Fig. 10. $^{13}$C NMR spectrum of compound EtRh-N-NH$_2$ in CDCl$_3$. 
Supplementary Fig. 11. The HRMS spectrum of compound EtRh-N-NH₂

References


