

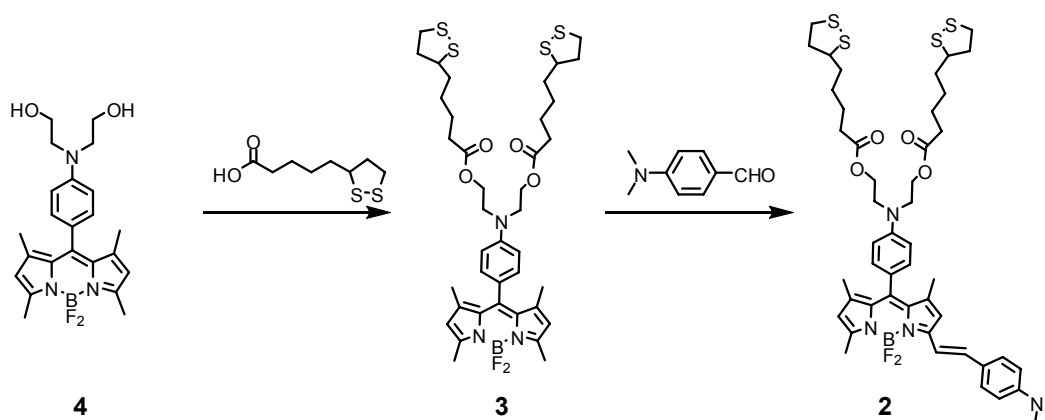
BODIPY-functionalized gold nanoparticles as a selective fluoro- chromogenic chemosensor for imaging Cu²⁺ in living cells

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Scheme S1. Synthetic route for 2.

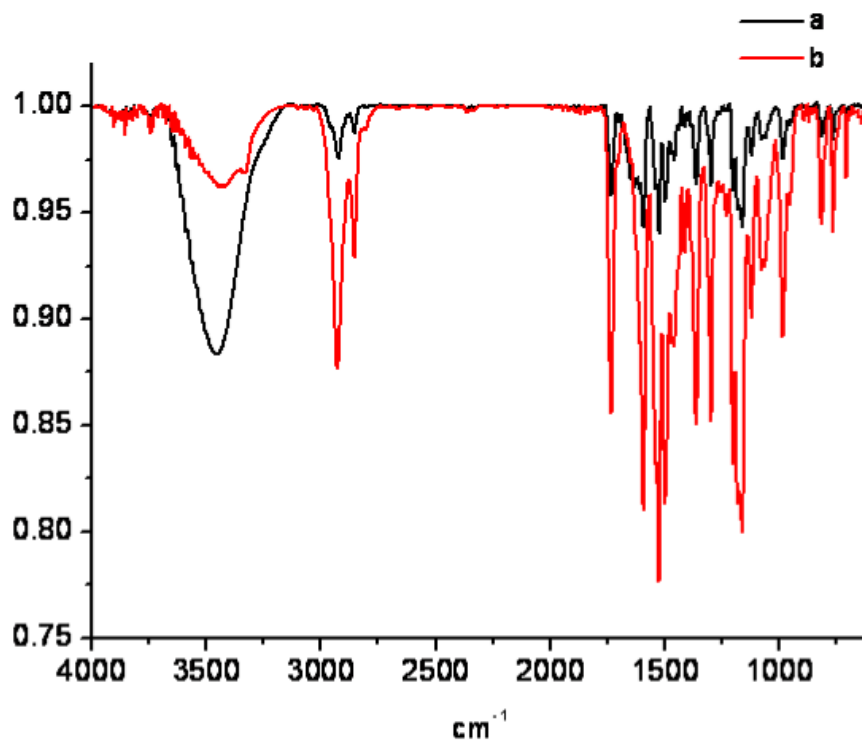


Fig. S1 Infrared spectra of (a) 1 and (b) 2.

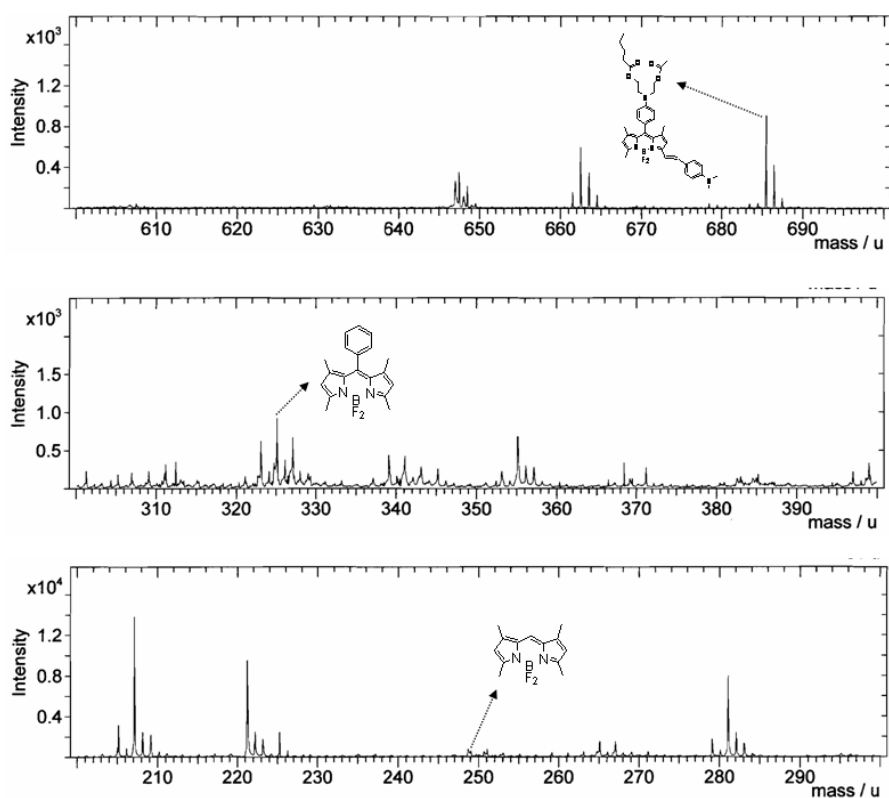


Fig. S2 TOF-SIMS spectra of 1.

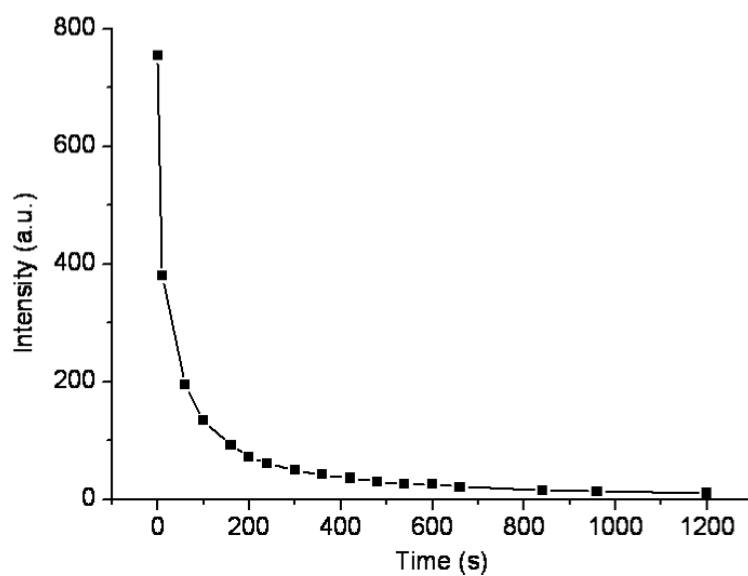


Fig. S3 Time course of the fluorescence intensity of 1 (10 μ M) in 20 mM HEPES (10% CH₃CN, pH 7.4) at 25 °C at the addition of Cu²⁺ (40 equiv).

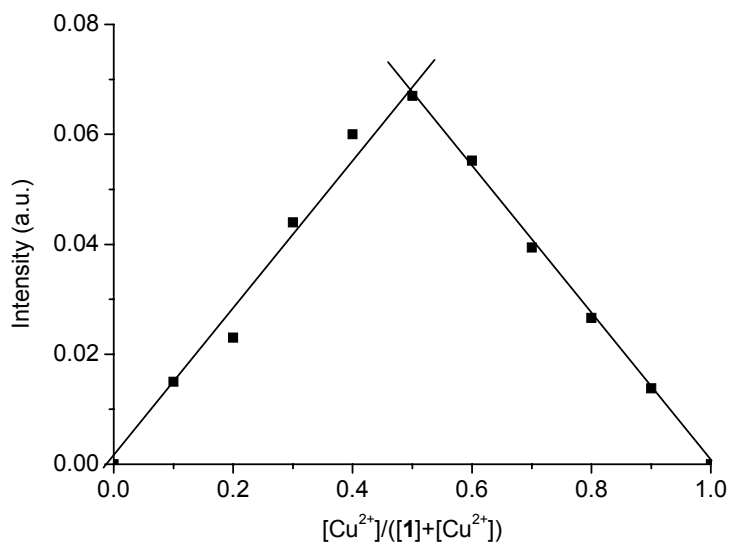


Fig. S4 Job's plot of 1:1 complexes of **1** and Cu²⁺. The pH value was adjusted by using 20 mM HEPES (10% CH₃CN), pH 7.4.

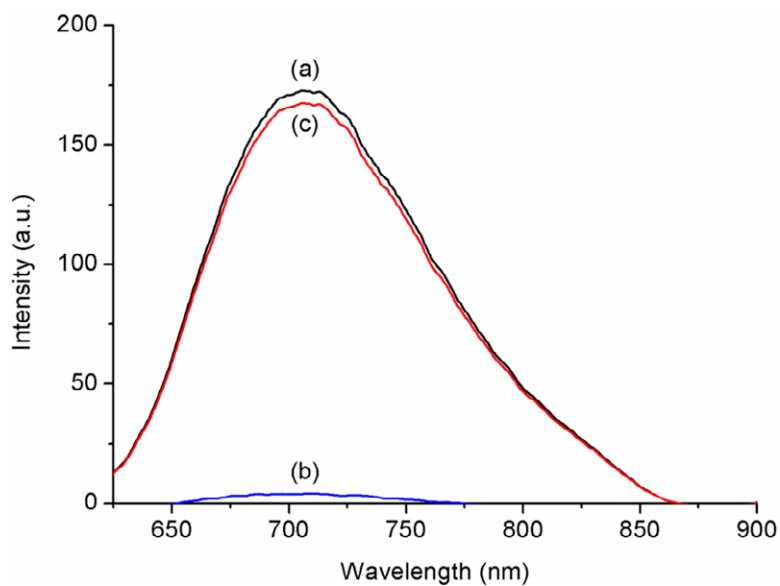


Fig. S5 Fluorescence spectra of **1** (10 µM) (a) without and (b) with Cu²⁺ ions and (c) after treatment with EDTA.

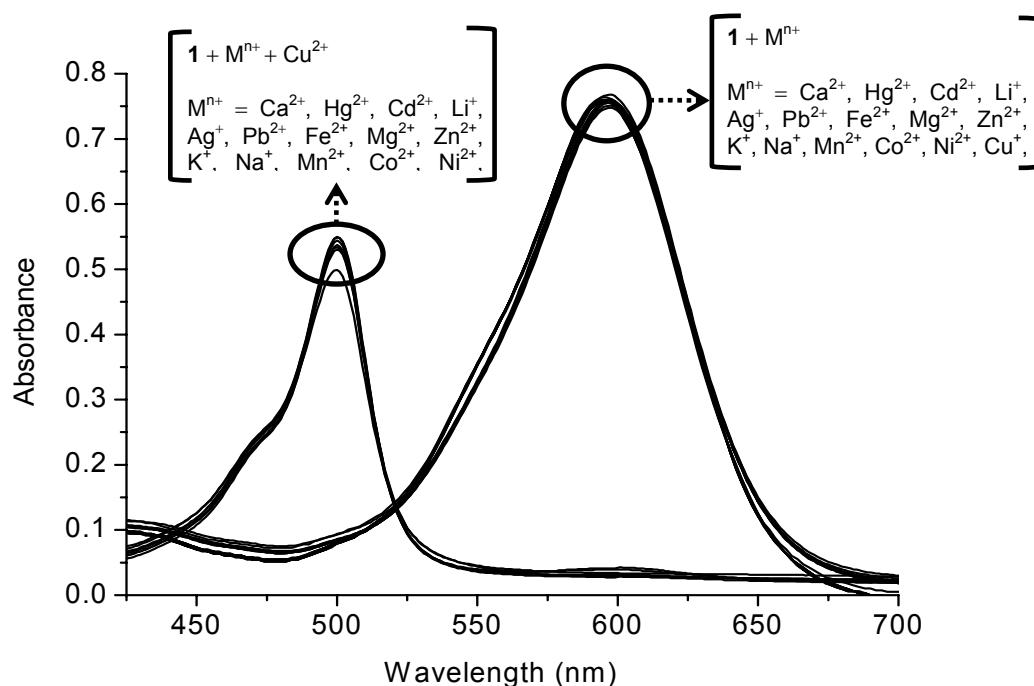


Fig. S6 Absorption spectra of **1** ($10 \mu\text{M}$) upon addition of Ca^{2+} , Hg^{2+} , Cd^{2+} , Li^{+} , Ag^{+} , Pb^{2+} , Fe^{2+} , Mg^{2+} , Zn^{2+} , K^{+} , Na^{+} , Mn^{2+} , Co^{2+} , Ni^{2+} and Cu^{+} (4 equiv) in aqueous solution. Absorption spectra of **1** ($10 \mu\text{M}$) upon addition of Ca^{2+} , Hg^{2+} , Cd^{2+} , Li^{+} , Ag^{+} , Pb^{2+} , Fe^{2+} , Mg^{2+} , Zn^{2+} , K^{+} , Na^{+} , Mn^{2+} , Co^{2+} , Ni^{2+} and Cu^{+} (4 equiv), and subsequent addition of Cu^{2+} (8 equiv) in aqueous solution. For all measurements, the pH value was adjusted by using 20 mM HEPES (10% CH_3CN), pH 7.4. The inset is visual color changes upon addition of metal ions.

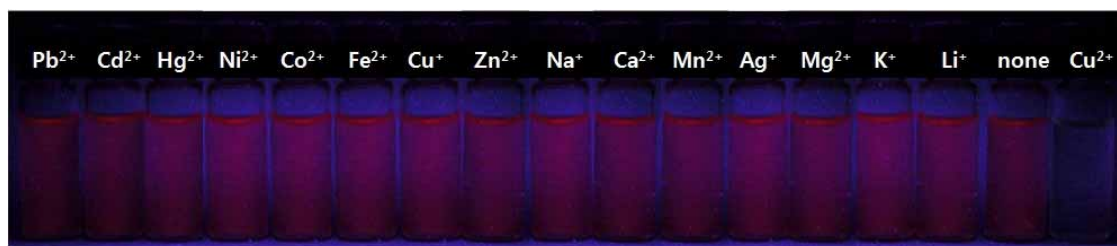
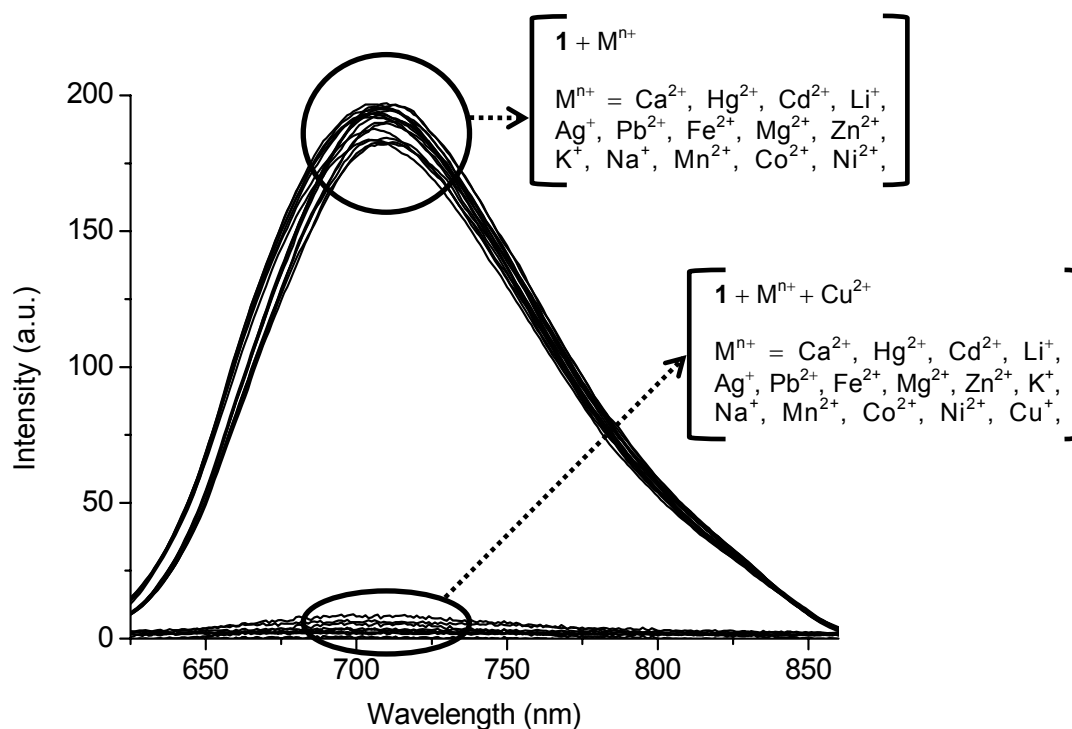


Fig. S7 Fluorescence responses of **1** ($10 \mu\text{M}$) upon addition of Ca^{2+} , Hg^{2+} , Cd^{2+} , Li^+ , Ag^+ , Pb^{2+} , Fe^{2+} , Mg^{2+} , Zn^{2+} , K^+ , Na^+ , Mn^{2+} , Co^{2+} , Ni^{2+} and Cu^+ (8 equiv) in aqueous solution. Fluorescence responses of **1** ($10 \mu\text{M}$) upon addition of Ca^{2+} , Hg^{2+} , Cd^{2+} , Li^+ , Ag^+ , Pb^{2+} , Fe^{2+} , Mg^{2+} , Zn^{2+} , K^+ , Na^+ , Mn^{2+} , Co^{2+} , Ni^{2+} and Cu^+ (8 equiv), and subsequent addition of Cu^{2+} (8 equiv) in aqueous solution. For all measurements, the pH value was adjusted by using 20 mM HEPES (10% CH_3CN), pH 7.4. Excitation was provided at 598 nm, and the emission was monitored at 704 nm. The inset is visual fluorescence changes upon addition of metal ions.

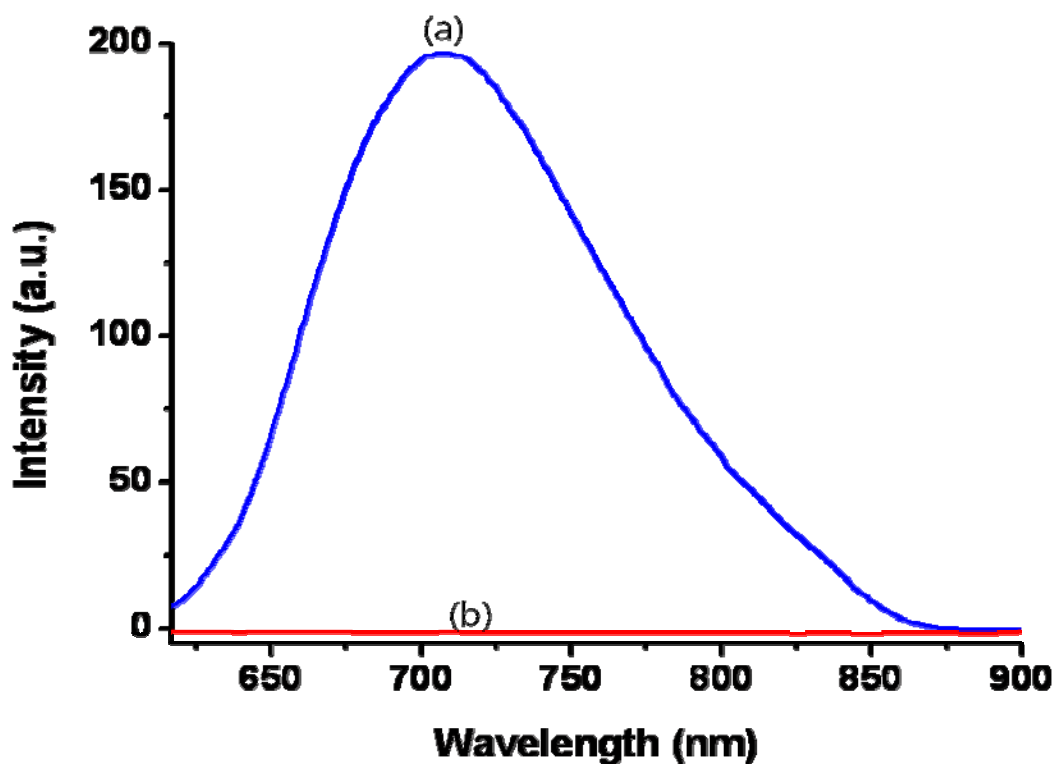


Fig. S8 Fluorescence responses of 10 μM **1** (a) without and (b) with Cu^{2+} ion ((100 μM) in the presence of cysteine (100 μM) and glutathione (100 μM) in 20 mM HEPES (10% CH_3CN) at pH 7.4 ($\lambda_{\text{ex}} = 598$ nm).

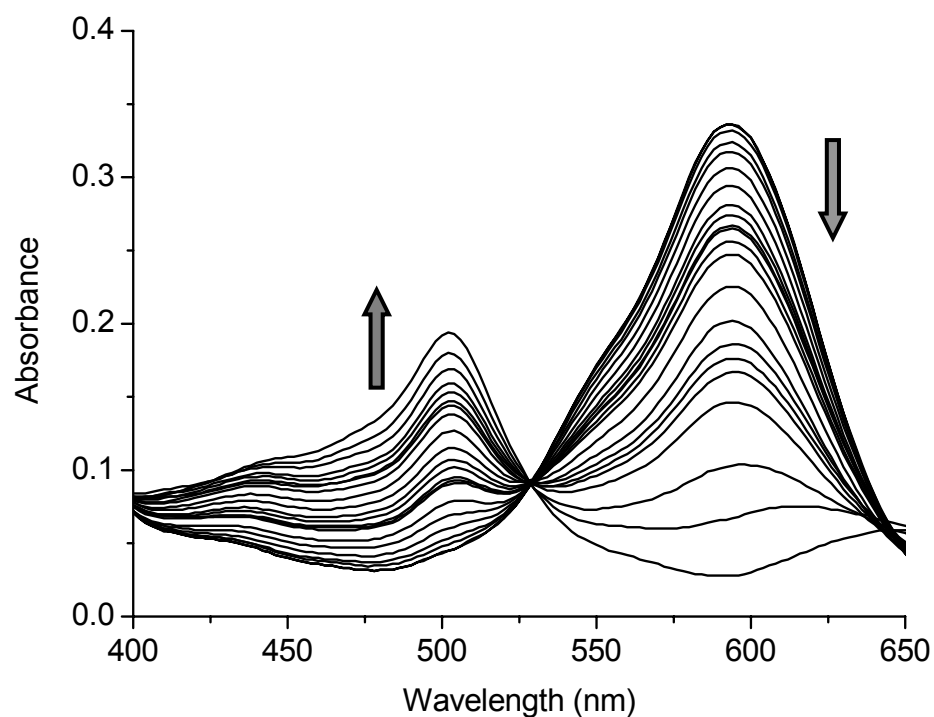


Fig. S9 Absorption spectra of **2** ($10 \mu\text{M}$) upon addition of increasing Cu^{2+} concentrations (0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.4, 1.6, 1.8, 2.0, 2.5, 3.0, 3.5 and 4.0 equiv) in acetonitrile.

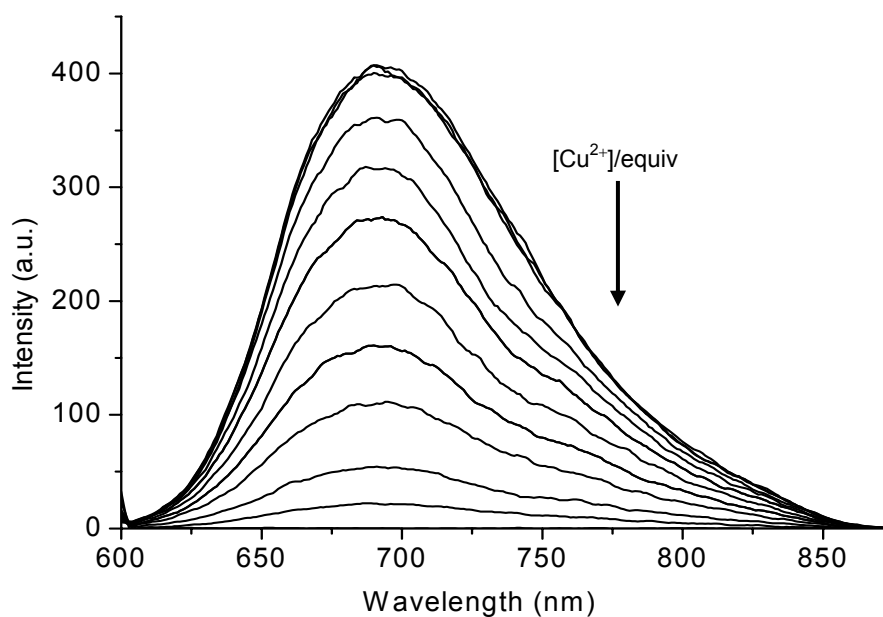


Fig. S10 Fluorescence responses of **2** ($10 \mu\text{M}$) upon addition of increasing Cu^{2+} concentrations (0, 0.1, 0.2, 0.4, 0.6, 0.8, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0 equiv) in acetonitrile. Excitation was provided at 596 nm, and the emission was monitored at 691 nm.

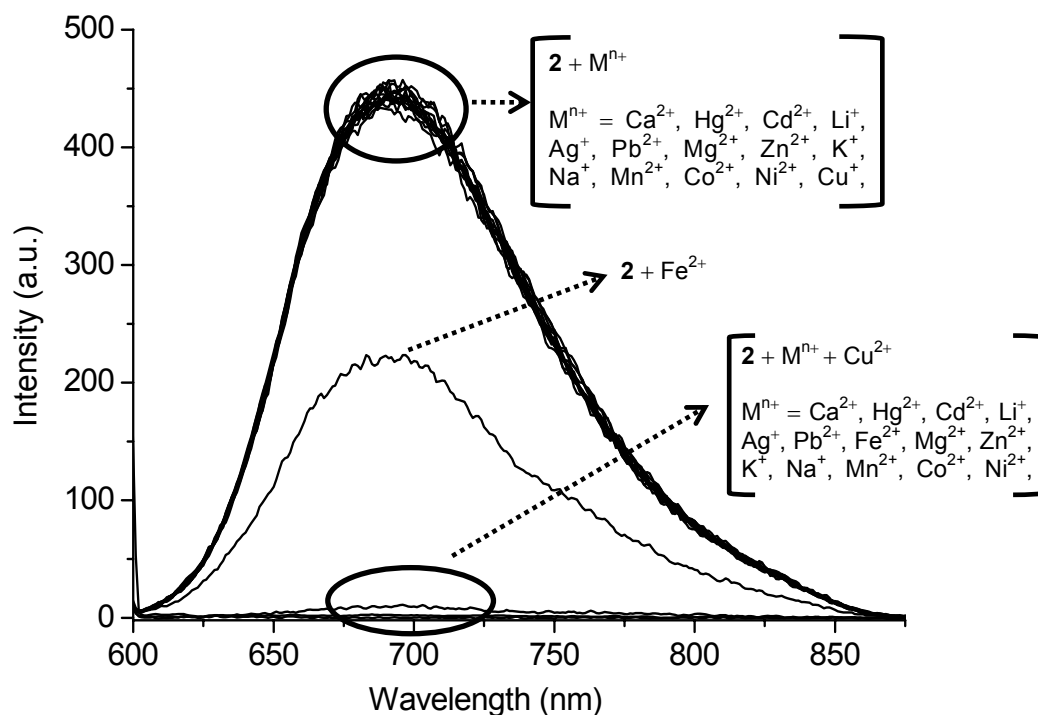


Fig. S11 Fluorescence responses of **2** (10 μM) upon addition of Ca²⁺, Hg²⁺, Cd²⁺, Li⁺, Ag⁺, Pb²⁺, Fe²⁺, Mg²⁺, Zn²⁺, K⁺, Na⁺, Mn²⁺, Co²⁺, Ni²⁺ and Cu⁺ (10 equiv) in acetonitrile. Fluorescence responses of **2** (10 μM) upon addition of Ca²⁺, Hg²⁺, Cd²⁺, Li⁺, Ag⁺, Pb²⁺, Fe²⁺, Mg²⁺, Zn²⁺, K⁺, Na⁺, Mn²⁺, Co²⁺, Ni²⁺ and Cu⁺ (10 equiv), and subsequent addition of Cu²⁺ (10 equiv) in acetonitrile. Excitation was provided at 596 nm, and the emission was monitored at 691 nm.

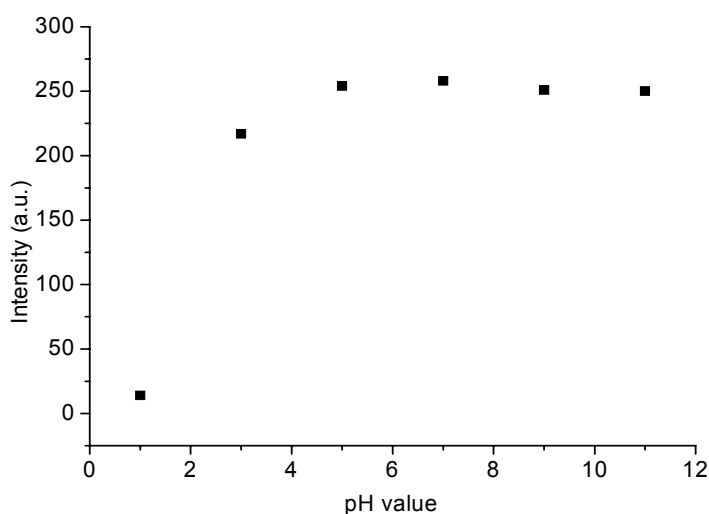


Fig. S12 Plot of pH values against fluorescence intensity of **1**.

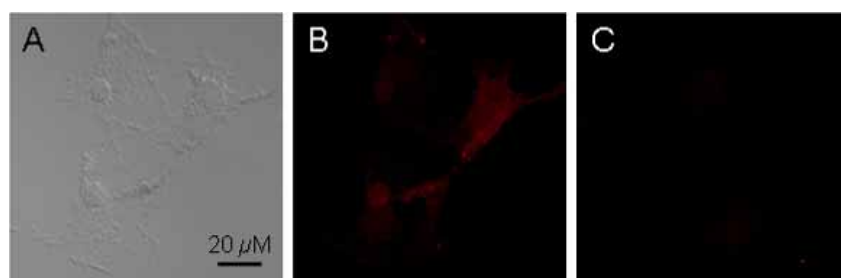


Fig. S13 Confocal fluorescence images of live Cos-7 cells. The excited light is 633 nm, and the emission is centered at 650 nm. (A) Bright-field transmission image of Cos-7 cells. (B) Fluorescence image of Cos-7 cells incubated with 5 μM **1** (0.5% CH_3CN) at 37 $^\circ\text{C}$. (C) Fluorescence image of Cos-7 cells further incubated with 5 μM $\text{Cu}(\text{ClO}_4)_2$ for 1 h at 37 $^\circ\text{C}$.

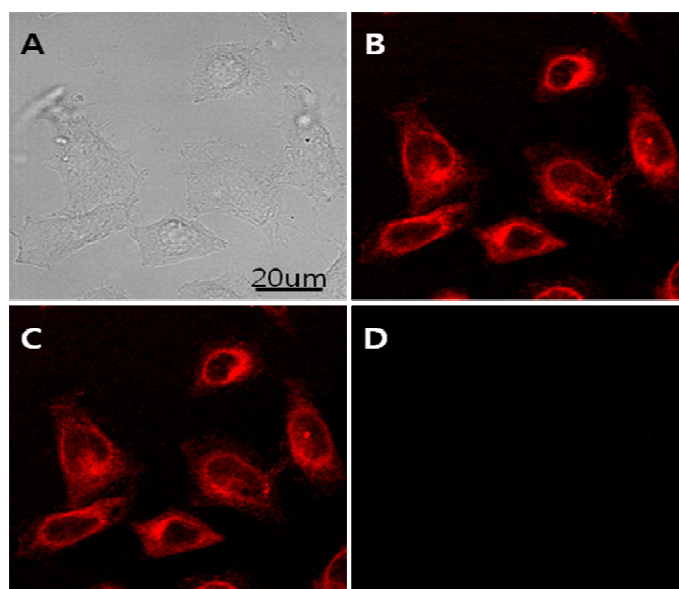


Fig. S14 Confocal fluorescence images of live HeLa cells. The excited light is 633 nm, and the emission is centered at 650 nm. (A) Bright-field transmission image of HeLa cells. (B) Fluorescence image of HeLa cells incubated with 5 μM **1** (0.5% CH_3CN). (C) Fluorescence image of **1**-loaded HeLa cells further incubated with 5 μM $\text{Zn}(\text{ClO}_4)_2$, $\text{Ca}(\text{ClO}_4)_2$, and $\text{Cd}(\text{ClO}_4)_2$ for 1 h at 37 $^\circ\text{C}$. (D) Fluorescence image of HeLa cells further incubated with 5 μM $\text{Cu}(\text{ClO}_4)_2$ for 1 h in the presence of 5 μM $\text{Zn}(\text{ClO}_4)_2$, $\text{Ca}(\text{ClO}_4)_2$, and $\text{Cd}(\text{ClO}_4)_2$ for 1 h at 37 $^\circ\text{C}$.

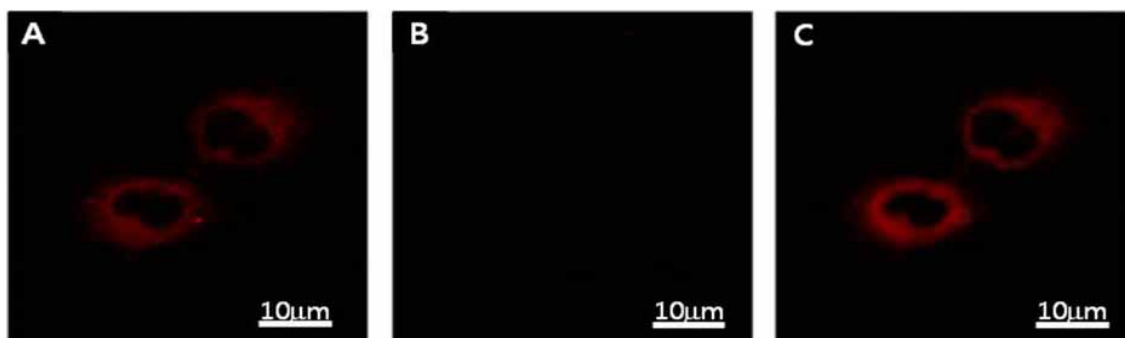


Fig. S15 Confocal fluorescence images of living HeLa cells. The excited light is 633 nm, and the emission is centered at 650 nm. (A) Fluorescence image of HeLa cells incubated with 5 μM **1** (0.5% CH_3CN) at 37 $^\circ\text{C}$. (B) Fluorescence image of **1**-loaded HeLa cells incubated with 5 μM Cu^{2+} ion at 37 $^\circ\text{C}$. (C) Fluorescence image of **1**+ Cu^{2+} loaded HeLa cells further incubated with 5 μM EDTA at 37 $^\circ\text{C}$.