Supporting information for:

Starch-Regulated Copper–Terephthalic Acid as pH/Hydrogen Peroxide Simultaneous-Responsive Fluorescence Probes for Lysosomes Imaging

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Supporting Information Figures

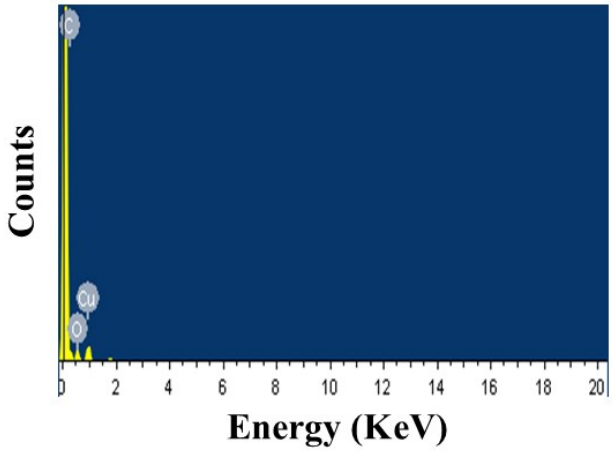

Figure S1. EDX spectrum of CuBDC-2.

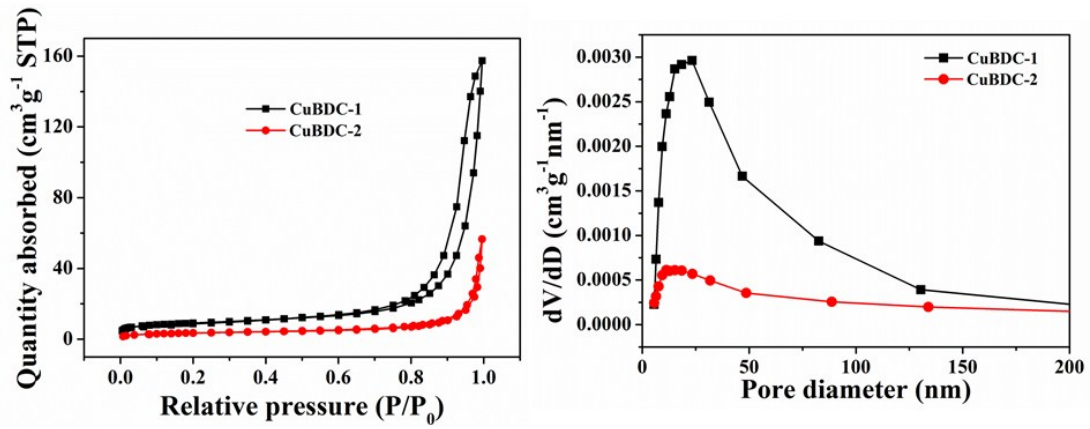

Figure S2. (a) N_2 adsorption and desorption isotherm and (b) BJH pore distribution of the CuBDC-1 and CuBDC-2.

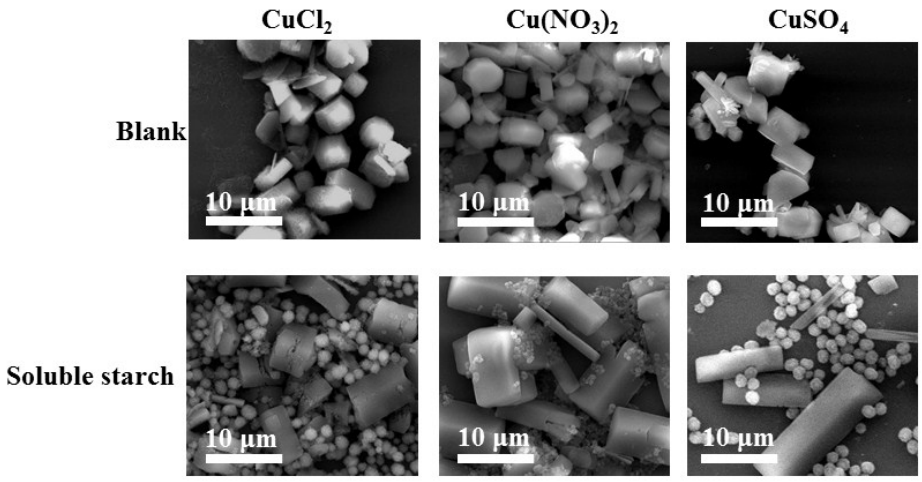

Figure S3. SEM images of CuBDC synthesized using different copper source with or without soluble starch.

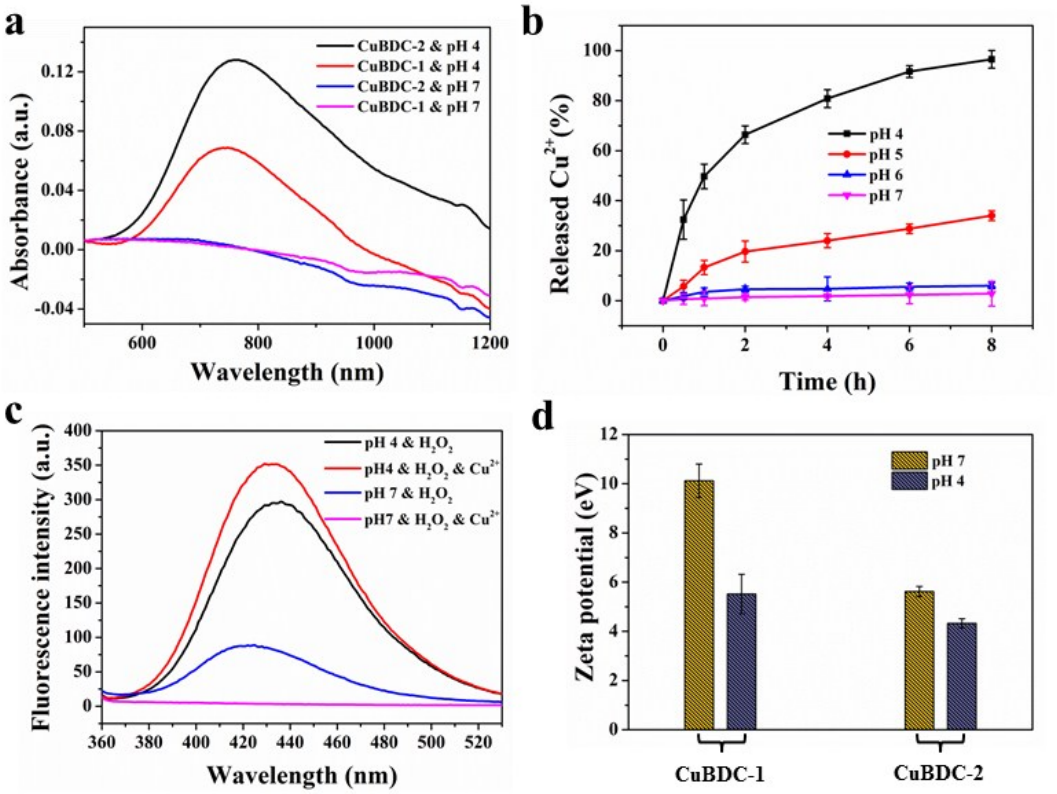

Figure S4. (a) UV-Vis spectra of supernatants withdrawn from the solution containing CuBDC-1 or CuBDC-2 at pH~4 or pH~7 after 4 h of dispersion. (b) Release of Cu^{2+} ions from CuBDC-2 in solutions at pH 4, 5, 6 and 7, respectively. (c) Fluorescence spectra of solution containing CuBDC-2 and H_2O_2 (1.5 mM) at pH 7 or pH 4 with or without extra Cu^{2+} added. (d) Zeta potential of CuBDC-1 and CuBDC-2 dispersed in solution at pH 7 or pH 4.

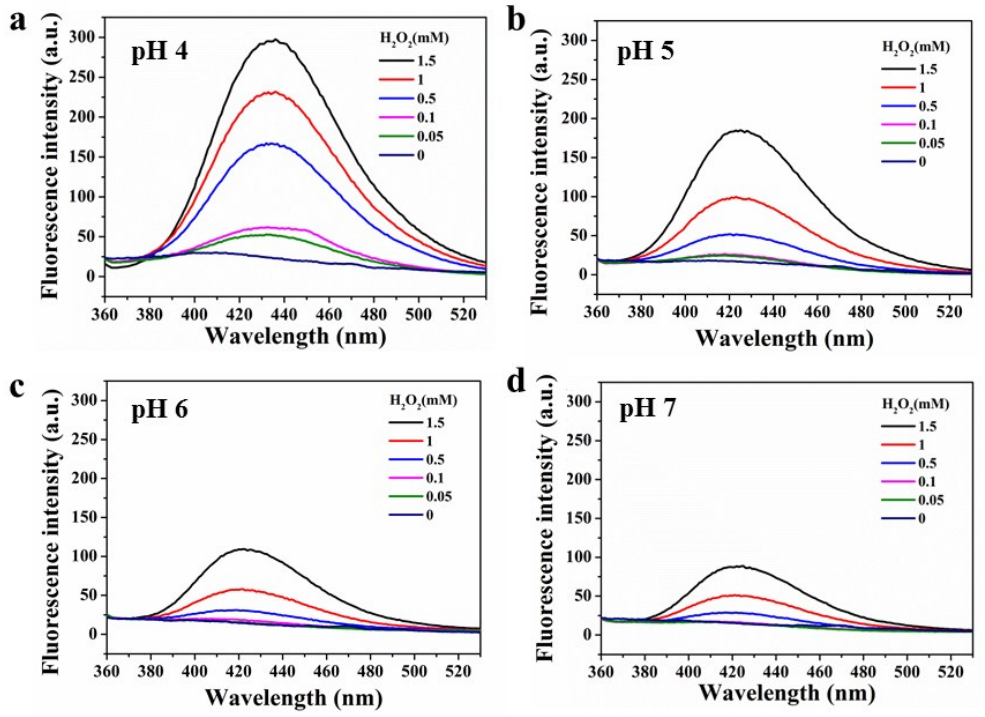

Figure S5. Fluorescence spectra of CuBDC-2 treated with different concentrations of H_2O_2 at pH~4 (a), pH~5 (b), pH~6 (c), pH~7 (d) for 4 h.

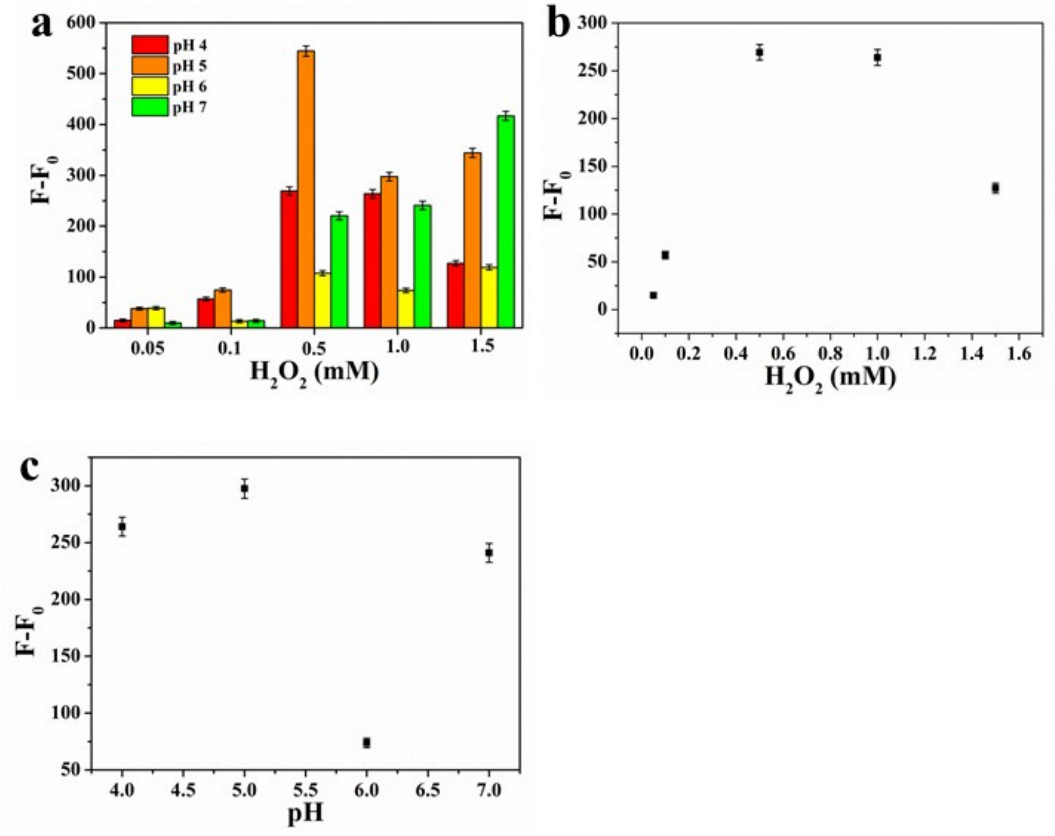

Figure S6. (a) Fluorescence intensity change of mixture of Cu^{2+} and TA treated with

different concentrations of H_2O_2 and different pH values for 4 h. F indicated the fluorescence intensity of solution containing mixture of Cu^{2+} and TA and different concentrations of H_2O_2 at different pH values for 4 h, F_0 indicated the fluorescence intensity of distilled water containing mixture of Cu^{2+} and TA. (b) Relationship between the fluorescence intensity change and H_2O_2 concentration in solutions containing mixture of Cu^{2+} and TA at pH~4 for 4 h. F indicated the fluorescence intensity of solution containing mixture of Cu^{2+} and TA and different concentrations of H_2O_2 at pH~4 for 4 h, F_0 indicated the fluorescence intensity of distilled water containing mixture of Cu^{2+} and TA. (c) Relationship between the fluorescence intensity change and pH values in solution containing mixture of Cu^{2+} and TA and 1 mM H_2O_2 for 4 h. F indicated the fluorescence intensity of solution containing mixture of Cu^{2+} and TA and 1 mM H_2O_2 at different pH values for 4 h, F_0 indicated the fluorescence intensity of distilled water containing mixture of Cu^{2+} and TA.

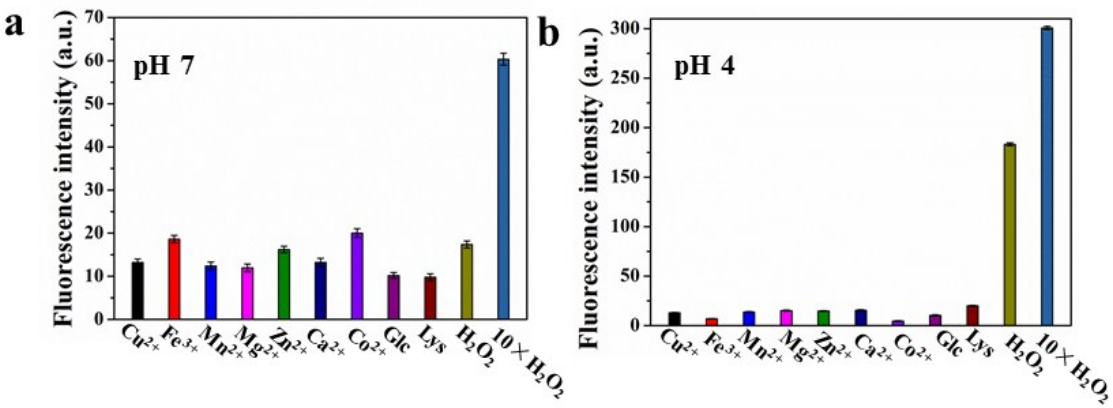

Figure S7. Fluorescence intensity of CuBDC-2 incubated with physiologically important metal ions and bio-molecules including Fe^{3+}, Cu^{2+}, Mn^{2+}, Zn^{2+}, Ca^{2+}, Mg^{2+}, Co^{2+}, glucose and L-lysine at pH~4 or pH~7.

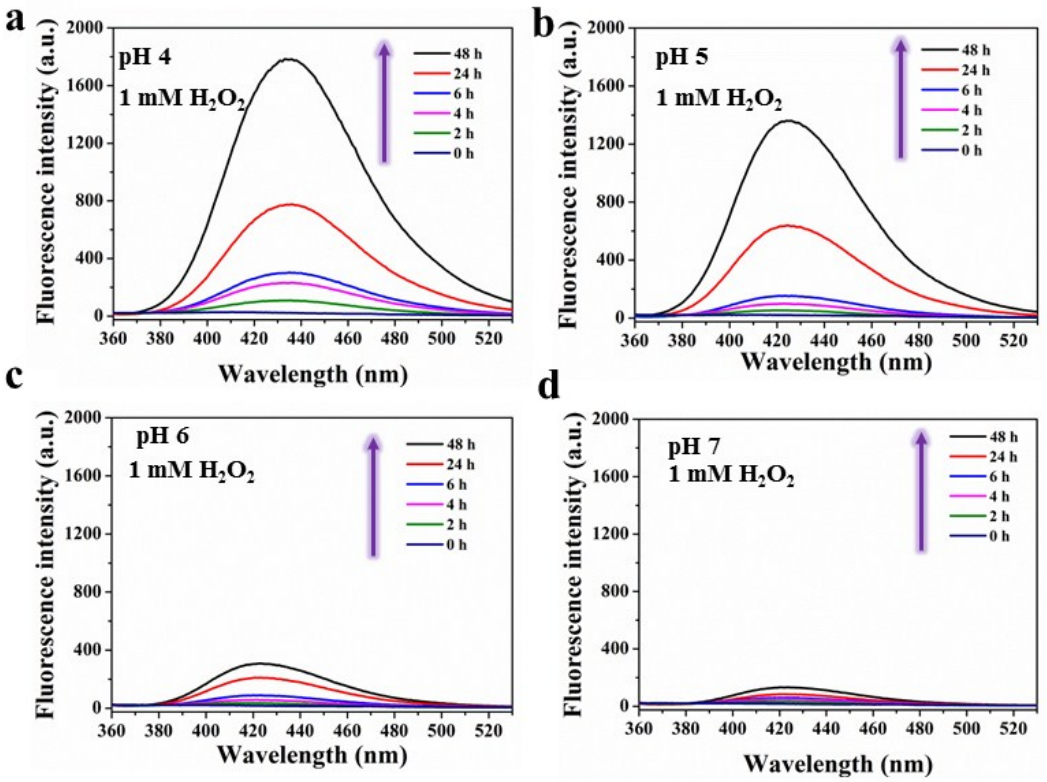

Figure S8. Fluorescence spectra of CuBDC-2 treated with 1mM H_2O_2 at pH~4 (a), pH~5 (b), pH~6 (c) or at pH~7 (d) over 48 h.

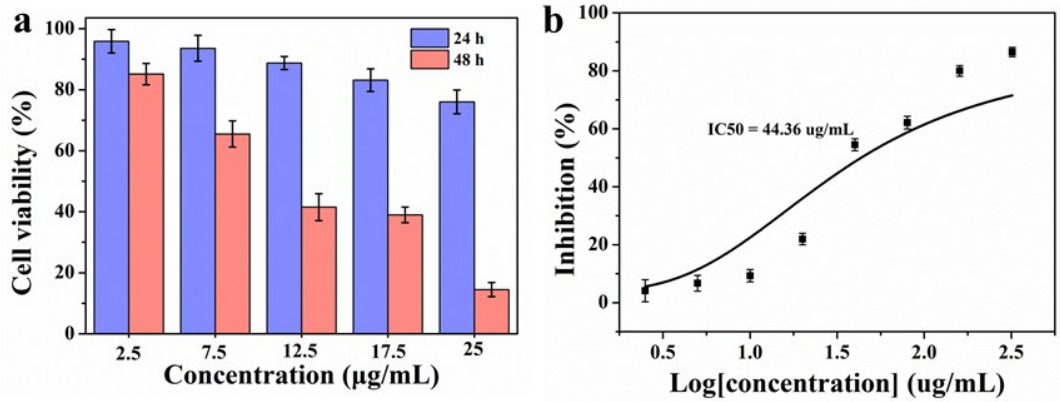

Figure S9. (a) Cell viability of HeLa cells treated with CuBDC-2 at 2.5, 7.5, 12.5, 17.5, 25 μg/mL for 24 h or 48 h. (b) Growth inhibition of HeLa cells by different concentrations of CuBDC-2. IC50 was determined by sigmoidal curve fitting.

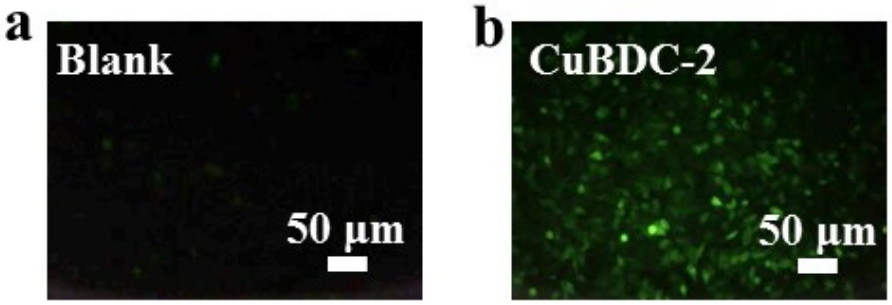

Figure S10. Fluorescence images of HeLa cells after co-incubation with CuBDC-2 for 4 h and then stained with ROS fluorescence probe DCFH-DA.

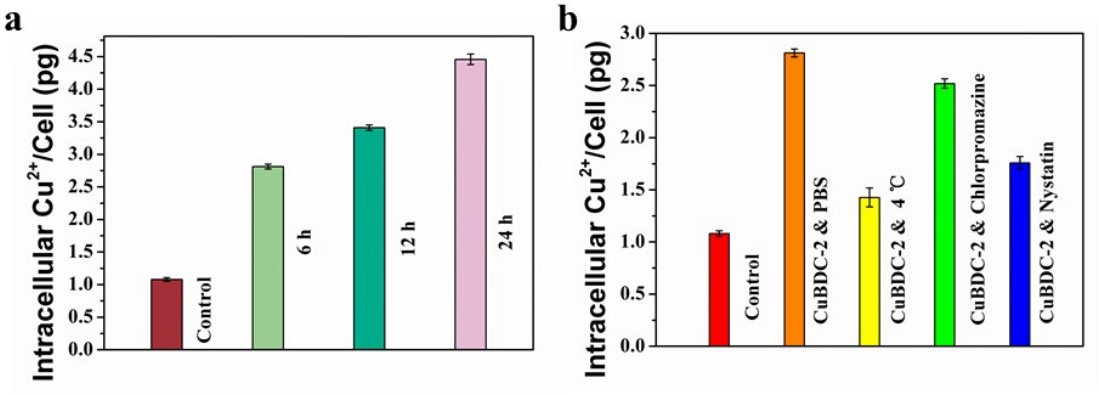

Figure S11. (a) Cell internalization of Cu^{2+} after incubated with CuBDC-2 for 6 h, 12 h or 24 h. (b) Cell internalization of Cu^{2+} after pretreated with different endocytosis inhibitors and then incubated with CuBDC-2 for 6 h.

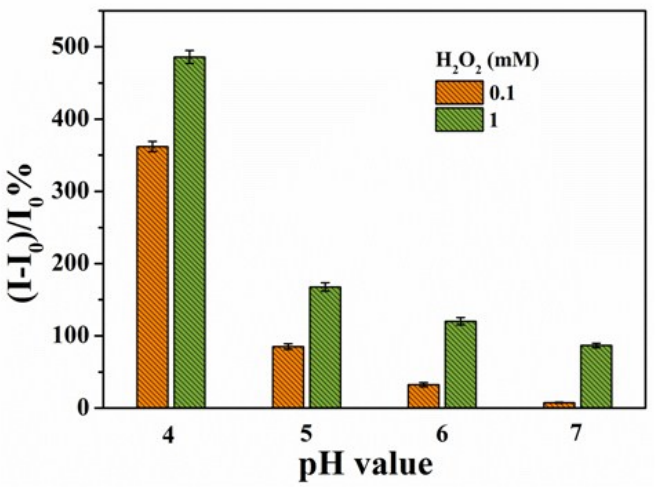

Figure S12. Fluorescence intensity of HeLa cells incubated with CuBDC-2 for 24 h and then treated with buffer solution at different pH values (pH~4, pH~5, pH~6 or pH~7), containing H_2O_2 (0.1 mM or 1mM) and nigericin. I indicated the fluorescence intensity of cells incubated with CuBDC-2 and treated with specific pH value and H_2O_2 concentration, I_0 indicated the fluorescence intensity of cells only incubated with CuBDC-2.