Supporting Information for

pH-regulated synthesis of trypsin-templated copper nanoclusters with blue and yellow fluorescent emission

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Calculation of the absolute QY. The absolute QY can be represented simply in the equation below:

$$QY = \frac{\int L_{\text{emission}}}{\int E_{\text{solvent}} - \int E_{\text{sample}}}$$

Here, QY was the absolute quantum yield, L_{emission} was the photoluminescence emission spectrum of the CuNCs sample, collected using the sphere; E_{sample} was the spectrum of the light used to excite the sample, collected using the sphere; E_{solvent} was the spectrum of the light used for excitation with only the solvent in the sphere, collected using the sphere. The solvent in this experiment was ultrapure water.

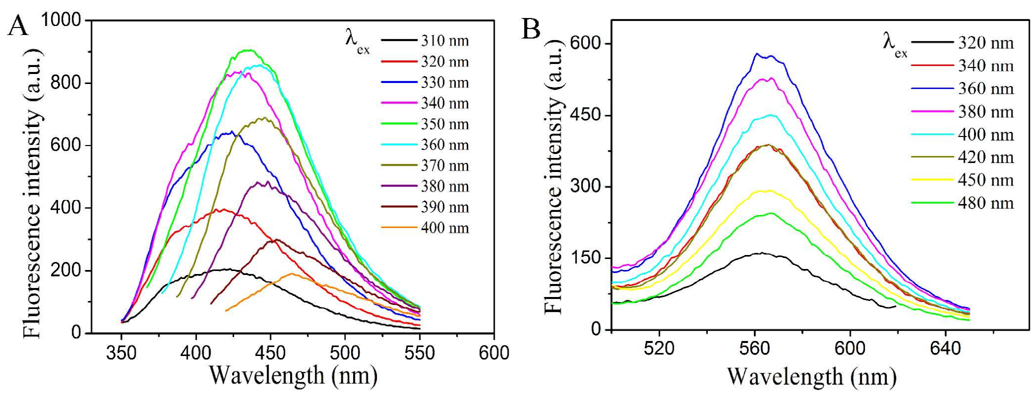

Figure S1. Fluorescence emission spectra (with progressively longer excitation wavelengths) of the blue-emitting (A) and yellow-emitting (B) CuNCs.

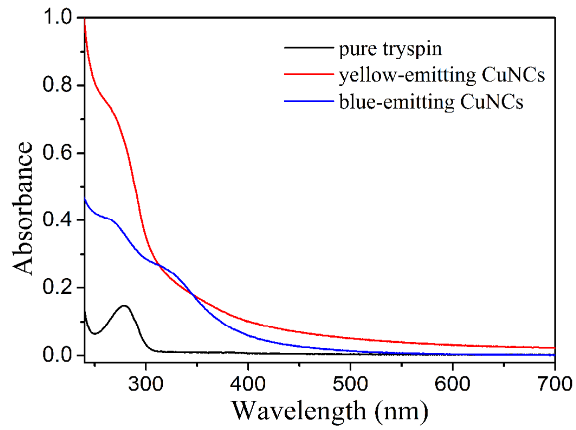

Figure S2. UV-vis absorption spectra of pure trypsin, blue-emitting and yellow-emitting CuNCs.

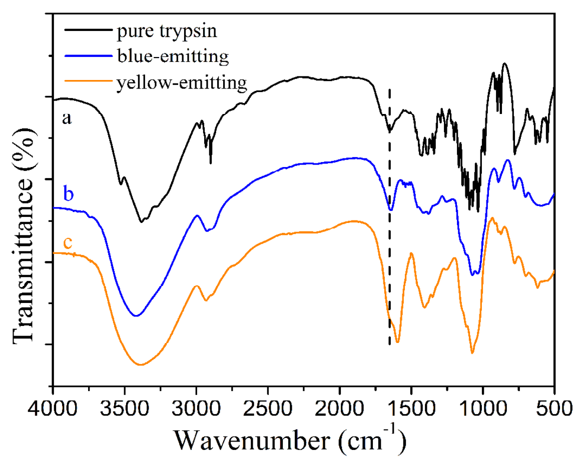

Figure S3. FT-IR spectra of pure trypsin, blue-emitting and yellow-emitting CuNCs.

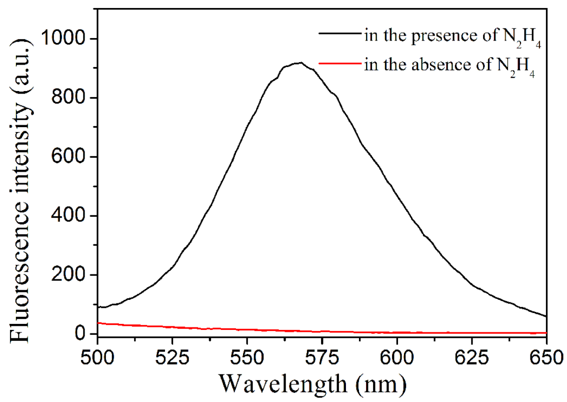

Figure S4. The fluorescence emission spectra of the yellow-emitting CuNCs prepared in the absence and presence of N_2H_4, respectively.

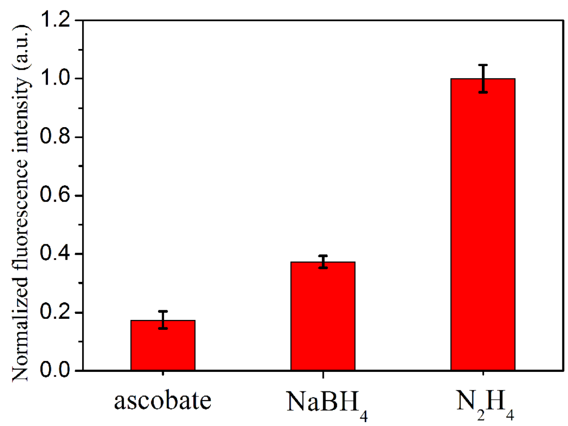

Figure S5. Normalized fluorescence intensity of products prepared by using various reducing agent.

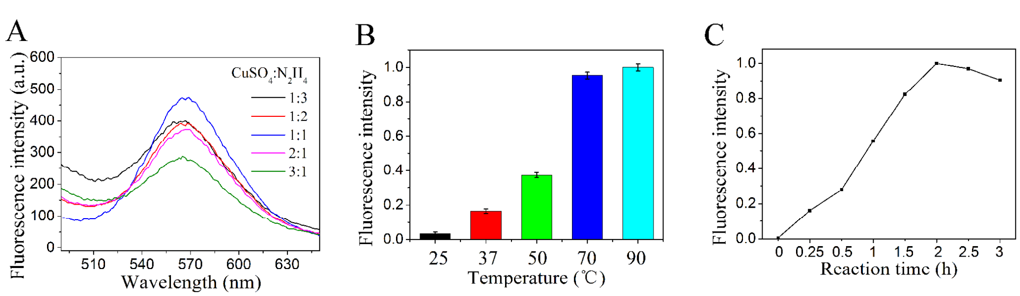

Figure S6. (A) Fluorescence emission spectra of the yellow-emitting CuNCs prepared with different molar ratios of $CuSO_4/N_2H_4$. (B) Fluorescence intensity of the yellow-emitting CuNCs prepared under different reaction temperature. (C) Fluorescence intensity of the yellow-emitting CuNCs as a function of reaction time.

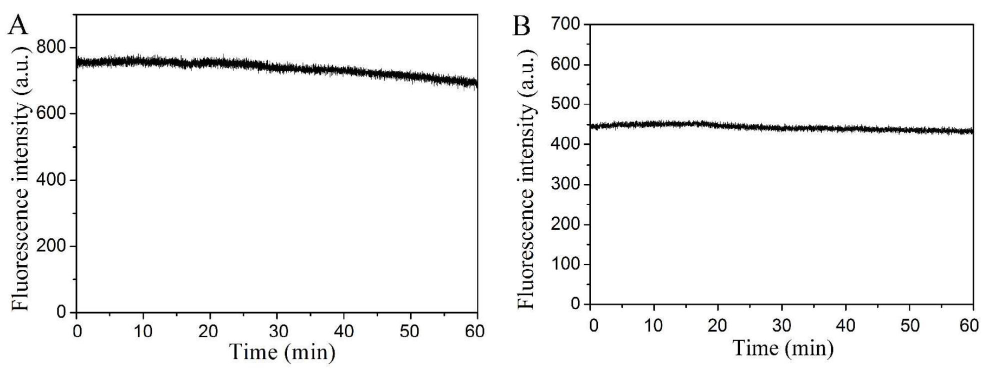

Figure S7. Fluorescence intensity variation of the yellow- (A) and blue-emitting (B) CuNCs in pH 4.0 PBS buffer solution as a function of time under 360 nm light illumination.

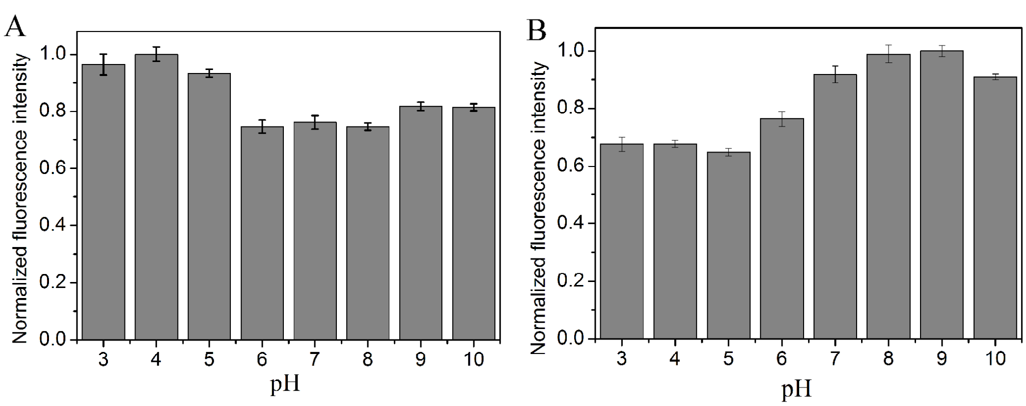

Figure S8. Fluorescence intensities of the yellow- (A) and blue- (B) emitting CuNCs at different pH values.

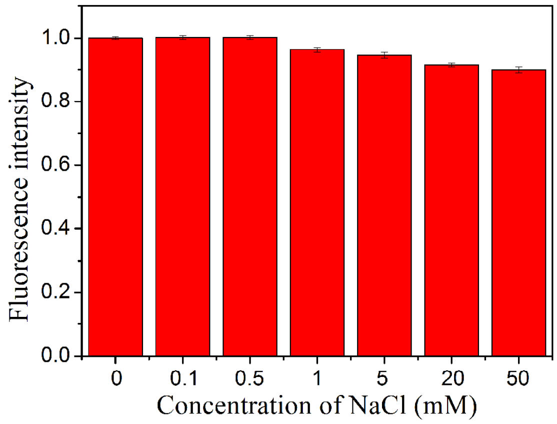

Figure S9. Fluorescence intensities of the yellow-emitting CuNCs in 10.0 mM pH 4.0 PBS after adding various concentrations of NaCl solutions.

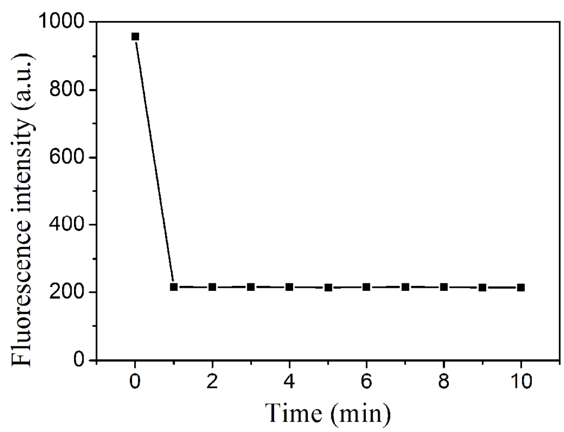

Figure S10. Time-dependent fluorescence intensity of the yellow-emitting CuNCs with the addition of Hg^{2+} at room temperature ($[Hg^{2+}]$ = 100 μM).

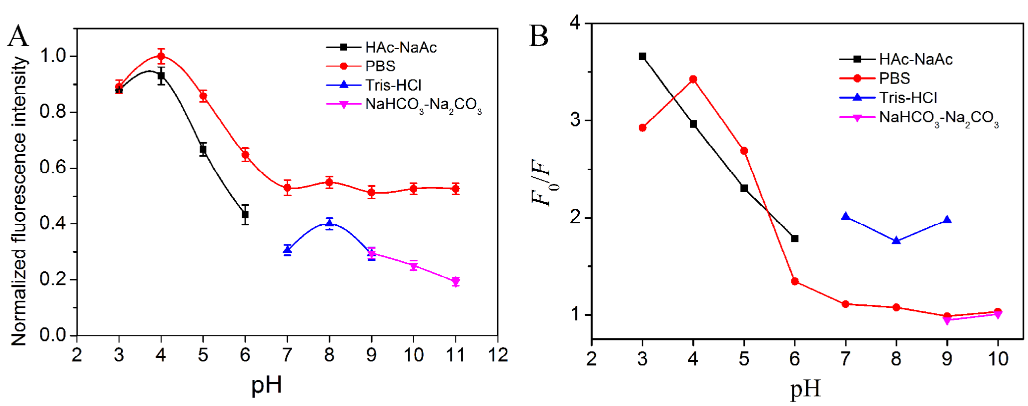

Figure S11. (A) The pH responses of the yellow-emitting CuNCs in various buffer solution. (B) Effect of pH on the fluorescence quenching efficiency of the yellow-emitting CuNCs. F_0 and F were the fluorescence intensities of the yellow-emitting CuNCs in the absence and presence of 80 μM Hg^{2+}, respectively.

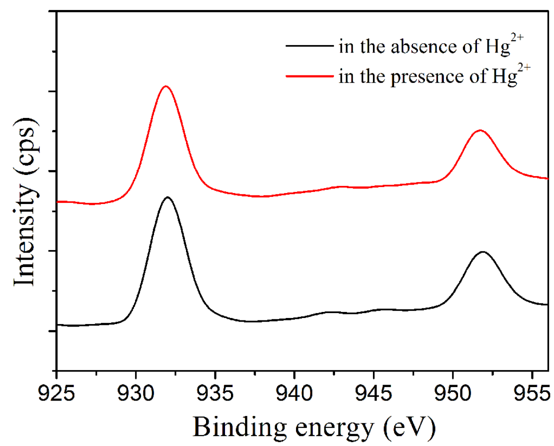

Figure S12. High resolution XPS spectra of Cu 2p of the CuNCs in the absence and presence of 100 μM Hg^{2+}, respectively.