Supporting information

Transferrin-directed preparation of red-emitting copper nanoclusters for targeted imaging of transferrin receptor over-expressed cancer cells

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Fig. S1 Optimization of the concentration of Trf and ascorbic acid. (A) The FL intensity of the Trf-Cu NCs under the different concentration of Trf (15, 30, 40, 50 and 60 mg mL^{-1}). The concentration of Cu^{2+} was 10 mM, and the final concentration of ascorbic acid was 23.0 mM. The reaction temperature and time were 25 ^{o}C and 3.5 h, respectively. (B) The FL intensity of the Trf-Cu NCs under the different final concentration of ascorbic acid (4.6, 11.5, 23.0, 34.5, 46.0 and 57.5 mM). The concentration of Trf and Cu^{2+} were fixed at 40 mg mL^{-1} and 10 mM, respectively. And the reaction temperature and time were 25 ^{o}C and 3.5 h.

Fig. S2 Optimization of the reaction time and temperature. (A) The FL intensity of the Trf-Cu NCs under different reaction time (1, 1.5, 2, 2.5, 3, 3.5, 4 and 5 h). The concentration of Trf and Cu^{2+} were fixed at 40 mg mL^{-1} and 10 mM, respectively. The reaction temperature was 25 ^{o}C. And the final concentration of ascorbic acid was 23.0 mM. (B) The FL intensity of the Trf-Cu NCs under different reaction temperatures (15, 25 and 37 ^{o}C). The concentration of Trf and Cu^{2+} were fixed at 40 mg mL^{-1} and 10 mM, respectively. The reaction time was 3.5 h. The final concentration of ascorbic acid was 23.0 mM.

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3 Fig. S3 Fluorescence intensity of the Trf-Cu NCs at different time intervals at 15 ^{o}C
4 (A) and 37 ^{o}C (B). The concentration of Trf and Cu^{2+} were fixed at 40 mg mL^{-1} and
5 10 mM, respectively. And the final concentration of ascorbic acid was 23.0 mM.

Fig. S4 The emission wavelength (■) and the corresponding FL intensity (●) of the Trf-Cu NCs with three different Cu precursors (1: $CuSO_4$, 2: $CuCl_2$, 3: $Cu(NO_3)_2$).

Fig. S5 XPS spectrum of the Trf-Cu NCs.