Electronic Supplementary Information for:

Aqueous synthesis of highly fluorescent and stable Cu-In-S/ZnS core/shell nanocrystals for cell imaging

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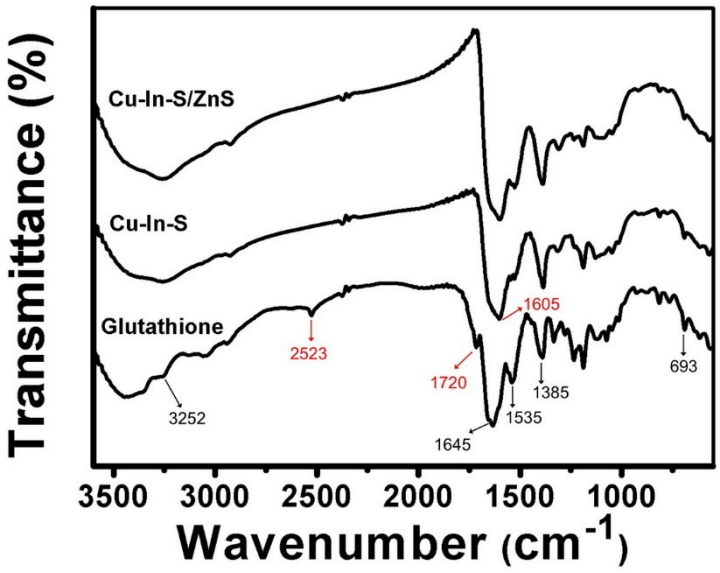

Fig. S1 FT-IR spectra of glutathione, Cu-In-S NCs, and Cu-In-S/ZnS NCs. The N-H stretching vibration and wagging vibration peaks appeared at 3252 and 693 cm^{-1}, respectively. The peaks at 1645, 1535, and 1385 cm^{-1} can be attributed to amide I, amide II, and amide III bands. For Cu-In-S NCs and Cu-In-S/ZnS NCs, the characteristic peak of free thiol groups at 2523 cm^{-1} disappeared,[1,2] which confirmed that thiol groups in glutathione have covalently bound with the metal atoms on the surface of NCs. Moreover, the C=O stretching vibration of -COOH shifted from 1720 to 1605 cm^{-1}, which can be ascribed to the deprotonation of -COOH.[3]

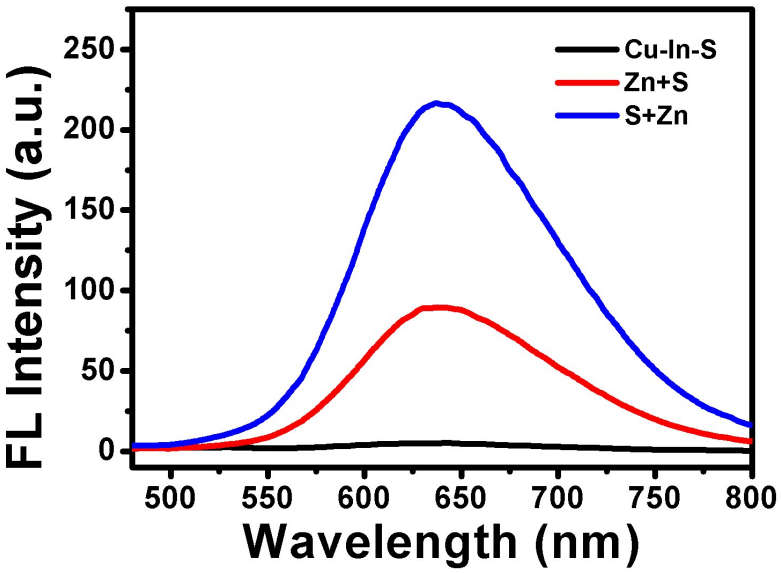

Fig. S2 Comparison of FL intensity of the products with different adding sequence of first Zn and then S precursors (red line), and first S and then Zn precursors (blue line).

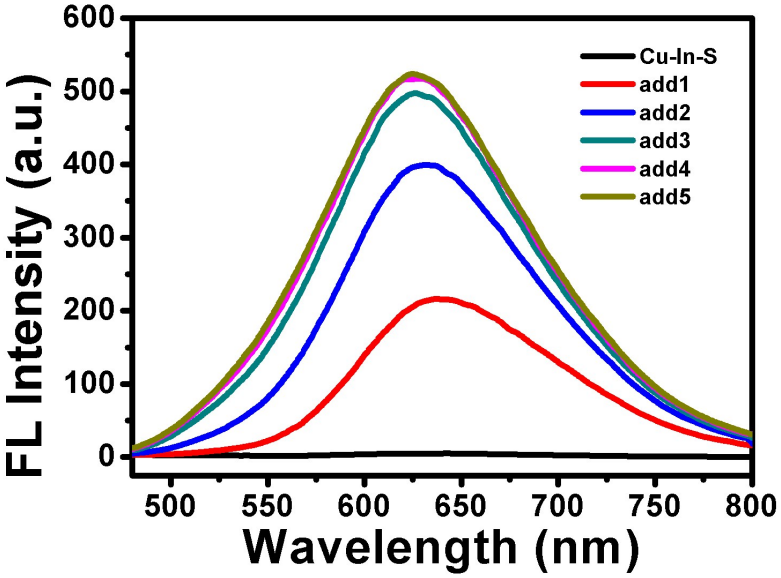

Fig. S3 FL emission spectra of Cu-In-S/ZnS NCs with different addition times of S and Zn precursors.

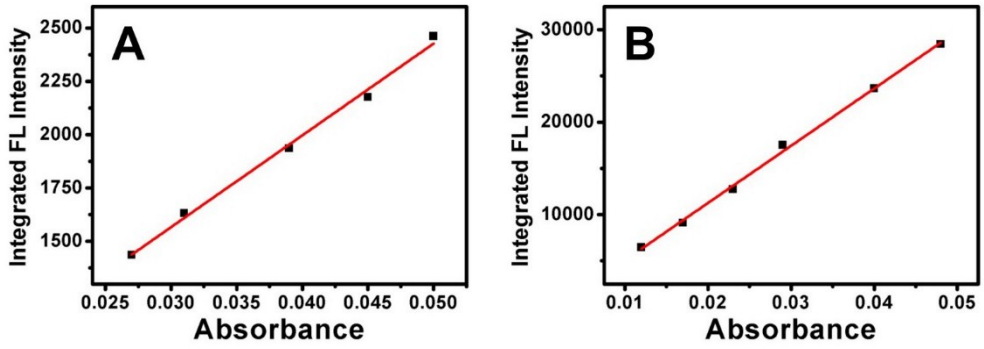

Fig. S4 Integrated FL intensity *vs.* optical density (absorbance) of Cu-In-S/ZnS NCs in water (A) and R6G in ethanol (B).

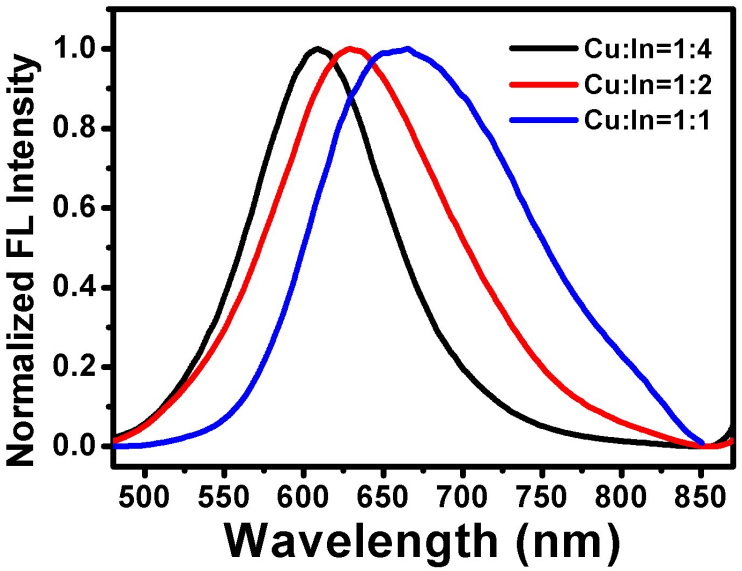

Fig. S5 FL emission spectra of Cu-In-S/ZnS NCs with different Cu/In raw ratios.

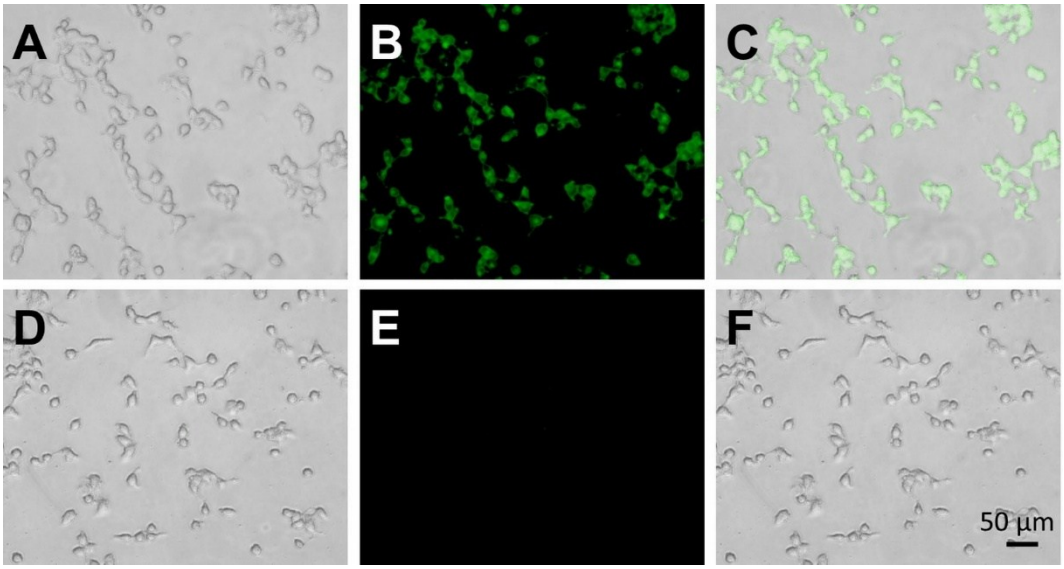

Fig. S6 Bright-field images, FL images, and the merged images of CAL-27 cells after the incubation with FITC-WGA (A, B, and C) and FITC (D, E, and F). CAL-27 cells showed strong green FL after treated with FITC-WGA, and almost no green FL with FITC, indicating abundant WGA receptors on the membrane of CAL-27 cells.

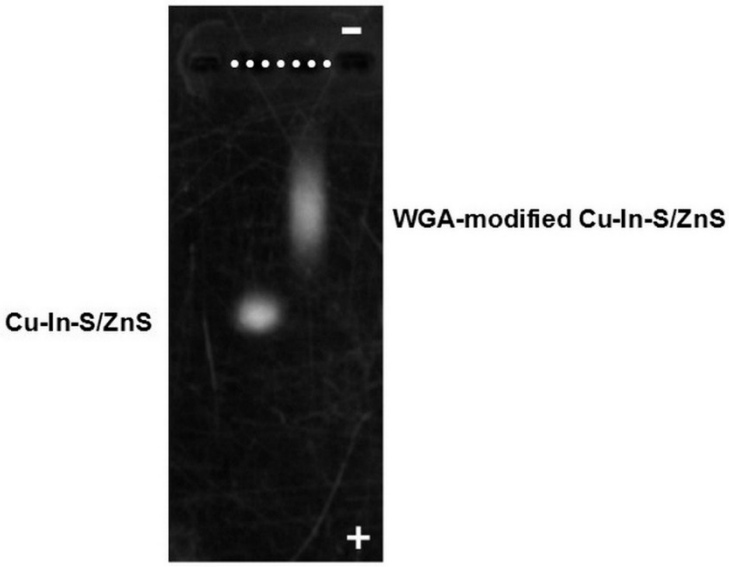

Fig. S7 Agarose gel electrophoresis result of WGA-modified Cu-In-S/ZnS NCs and Cu-In-S/ZnS NCs at the mode of FL field. The dashed line indicates the location of the loading wells.

References

(1) S. L. Cumberland, M. G. Berrettini, A. Javier and G. F. Strouse, *Chem. Mater.*, 2003, **15**, 1047-1056.

(2) L. Wu, B. G. Quan, Y. L. Liu, R. Song and Z. Y. Tang, *ACS Nano*, 2011, **5**, 2224-2230.

(3) E. M. Kim, S. T. Lim, M. H. Sohn and H. J. Jeong, *J. Nanopart. Res.*, 2017, **19**, 251.