Supporting Information

Copper nanoclusters with aggregation-induced emission: an effective photodynamic antibacterial agent for treating bacterial-infected wound

Zhen Jiang,[a] Yongqi Wei,[a] Yun Wang,[c] Songjie Han,[a] Ze Li,[a] Sihang Liu,[a] Zihao Wang,[a] Zhijun Li,[b] Ting Feng, Haiguang Zhu[a,b] and Xun Yuan*[a]*

[a]*College of Materials Science and Engineering, Qingdao University of Science and Technology (QUST), 53 Zhengzhou Rd., Shibei District, Qingdao 266042, P. R. China. Email address: yuanxun@qust.edu.cn (Xun Yuan), zhuhg@qust.edu.cn (Haiguang Zhu).*

[b]*Gongtao New Materials Groups, 60 Wuling Rd., Boshan District, Zibo, 255200, China.*

[c]*Department of Hematology, Qingdao Women and Children's Hospital, Qingdao 266 011, P. R. China*

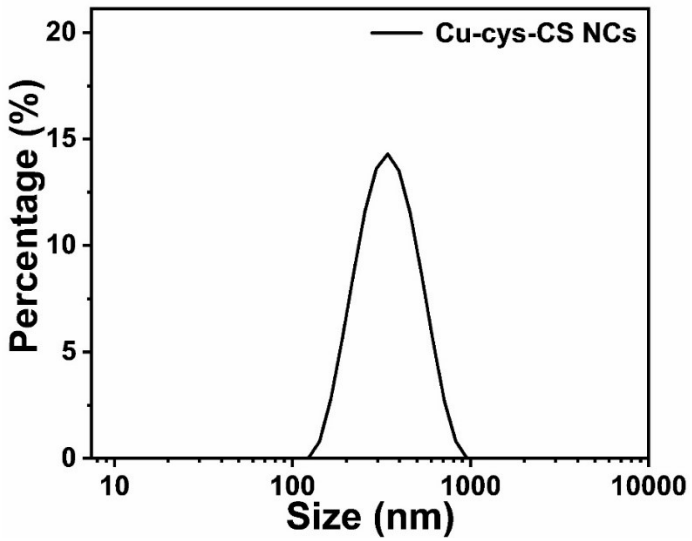

Figure S1. DLS result of Cu-cys-CS NCs in aqueous solution.

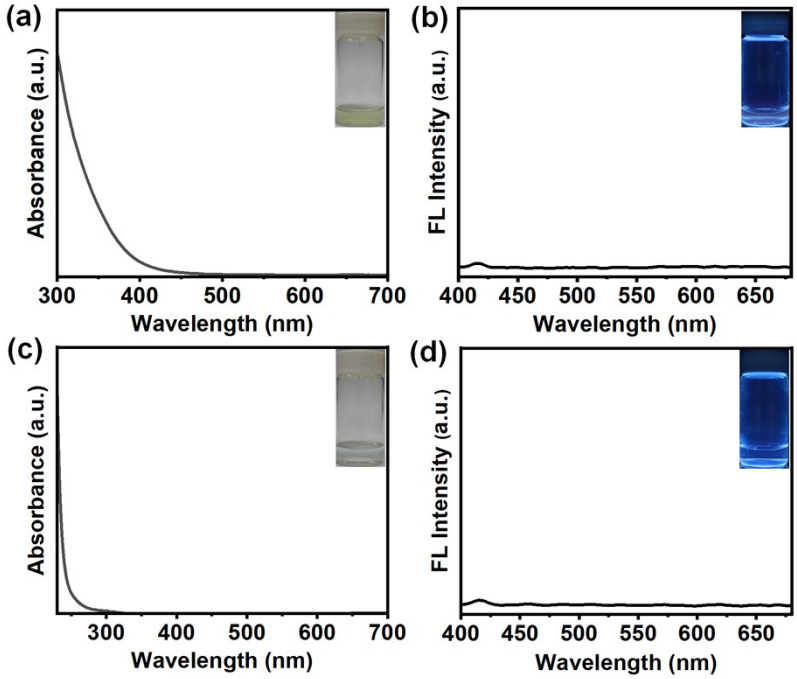

Figure S2. UV−vis absorption (a) photoemission spectra (b) of synthesis solution lacking added CS (the corresponding optical images of the solution under visible light illumination (inset of Figure S2a) and UV illumination (inset of Figure S2b)). UV−vis absorption (c) photoemission spectra (d) of synthesis solution lacking added cys (the corresponding optical images of the solution under visible light illumination (inset of

Figure S2c) and UV illumination (inset of Figure S2d)).

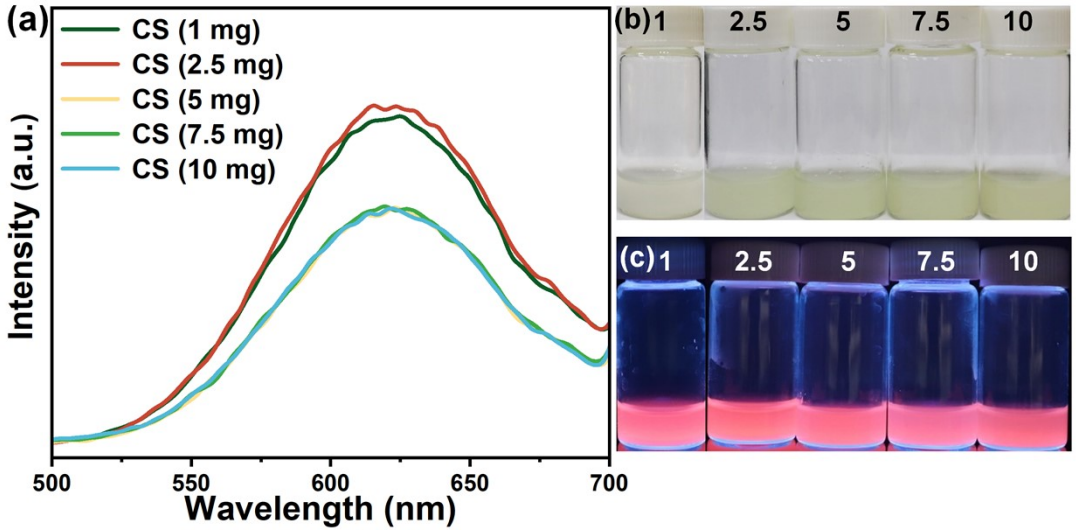

Figure S3. (a) The photoemission spectra of the synthesis solution adding different amounts of CS. The optical images of the different solutions under visible light illumination (b) and UV illumination (c).

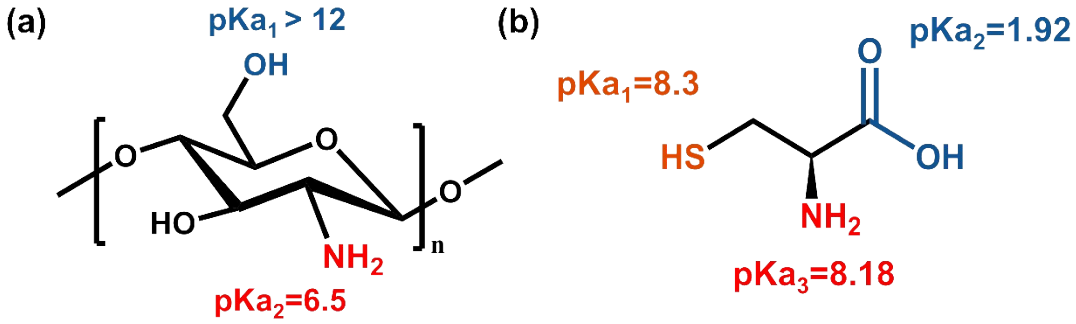

Figure S4. (a) The molecular structure and detailed pKa values of CS (a) and cys (b).

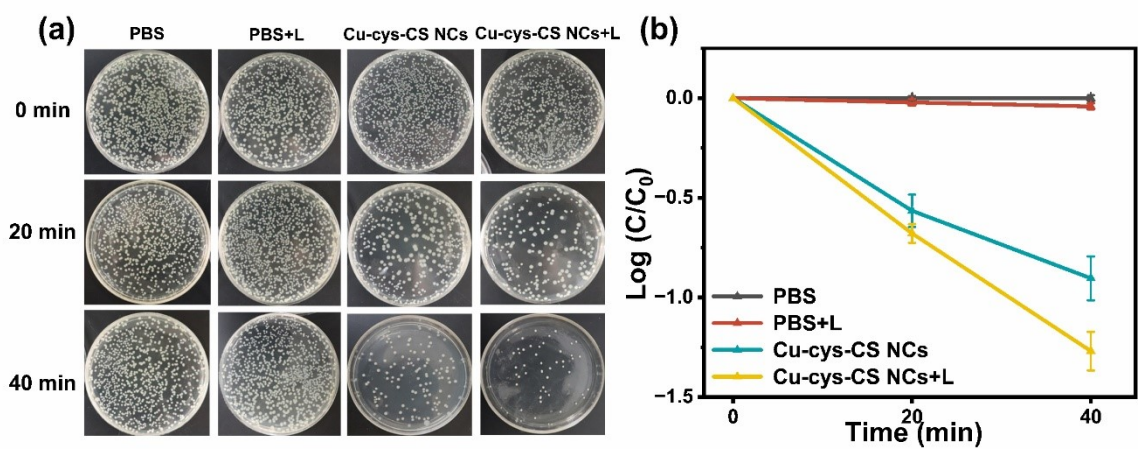

Figure S5. Bacterial colony growth (a) and quantitative analysis in bacterial viability (b) of *C. albicans* treated with Cu-cys-CS NCs under the condition of visible-light illumination for 40 minutes, and those reference groups treated with Cu-cys-CS NCs under dark condition and without antibacterial agents under the dark condition or visible-light illumination.

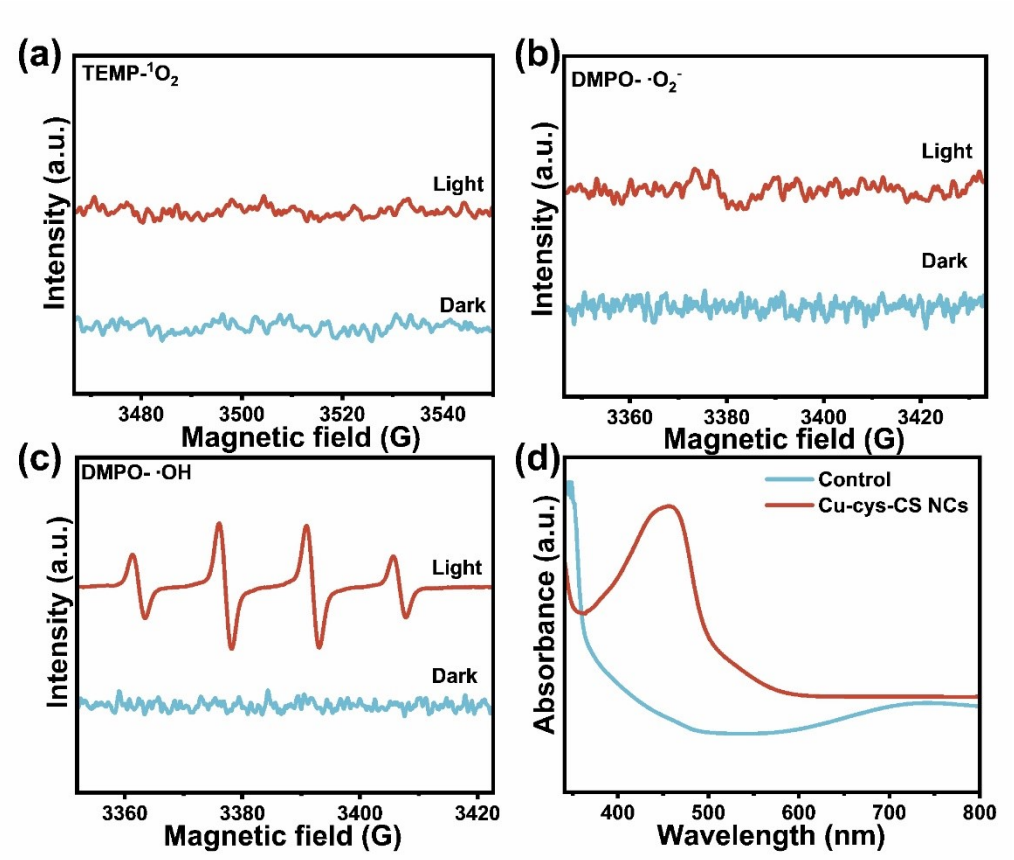

Figure S6. Electronic paramagnetic resonance (EPR) spectra of (a) $^1O_2$, (b) $\cdot O_2^-$, (c) ·OH of the Cu-cys-CS NCs under light illumination. (d) The absorbance of the generated Cu(I)-DMP complex over Cu-cys-CS NCs, using PBS as a reference.

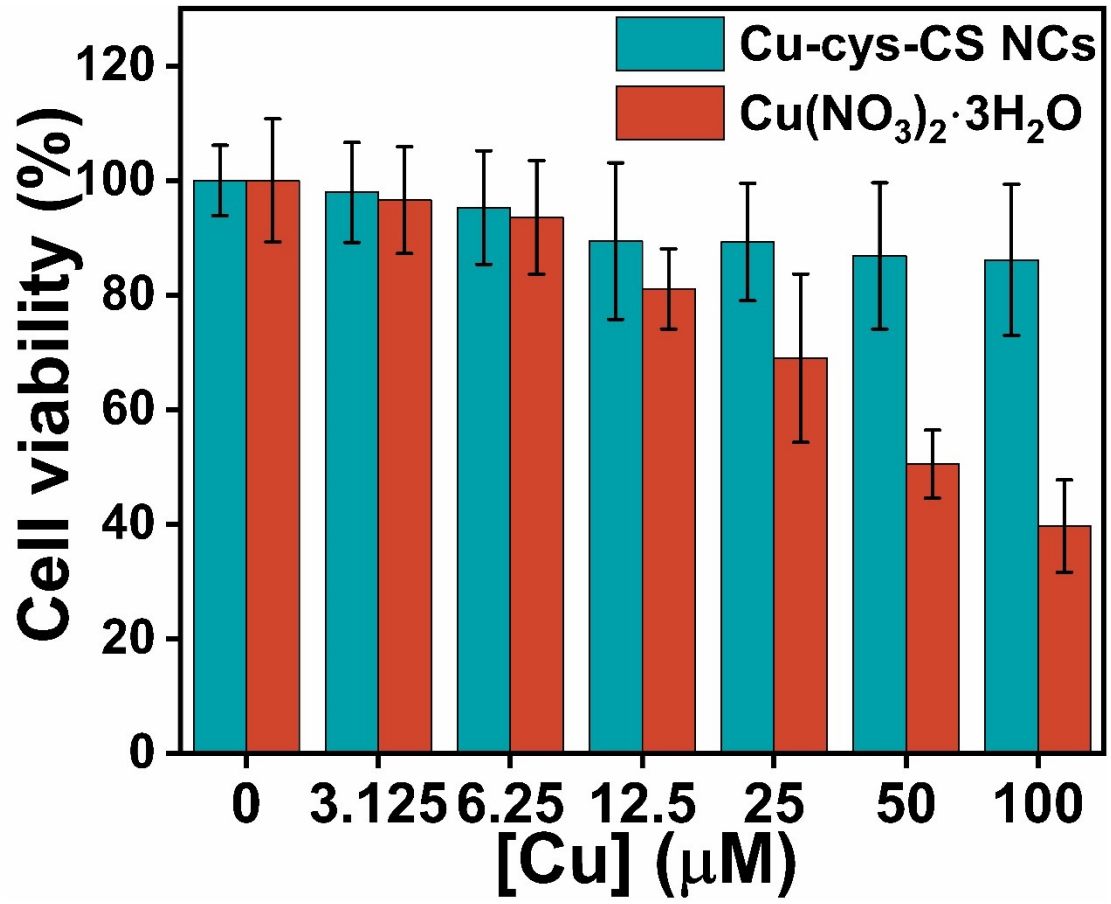

Figure S7. Cell viability of L929 cells after treatment with Cu-cys-CS NCs and $Cu(NO_3)_2 \cdot 3H_2O$ of different concentrations by MTT method.