

Supporting Information

Self-organization of Zinc ion with a photosensitizer *in vivo* for the enhanced antibiofilm and infected wound healing

Yan Chen,^{a,b,c,#} Min Zhang,^{b,c,#} Likai Chen,^b Mengmeng Pan,^{a,c} Mingming Qin,^{a,c}
Yanqiu Guo,^{a,c} Yaobo Zhang,^{a,c} Hao Pan,^{*b} Yunlong Zhou^{*a,b,c}

^a School of Ophthalmology and Optometry, Eye Hospital, School of Biomedical Engineering, Wenzhou Medical University, Wenzhou, Zhejiang Province, 325035, P. R. China.

^b Joint Centre of Translational Medicine, Department of Orthopaedics, the First Affiliated Hospital of Wenzhou Medical University, Wenzhou, Zhejiang Province, 325000, P. R. China.

^c Wenzhou Institute, University of Chinese Academy of Sciences, Wenzhou, Zhejiang Province, 325001, P. R. China.

These authors contributed equally to this work

* Corresponding author.

E-mail addresses: wzmuph@163.com (Hao Pan), zhouyl@ucas.ac.cn (Yunlong Zhou).

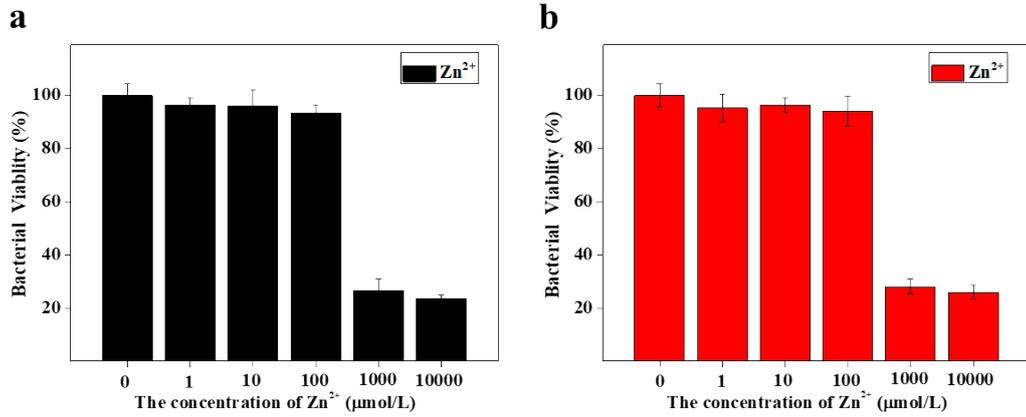


Fig. S1 Bacterial viability of *E. coli* (a) and *S. epidermidis* (b) treated by Zn²⁺

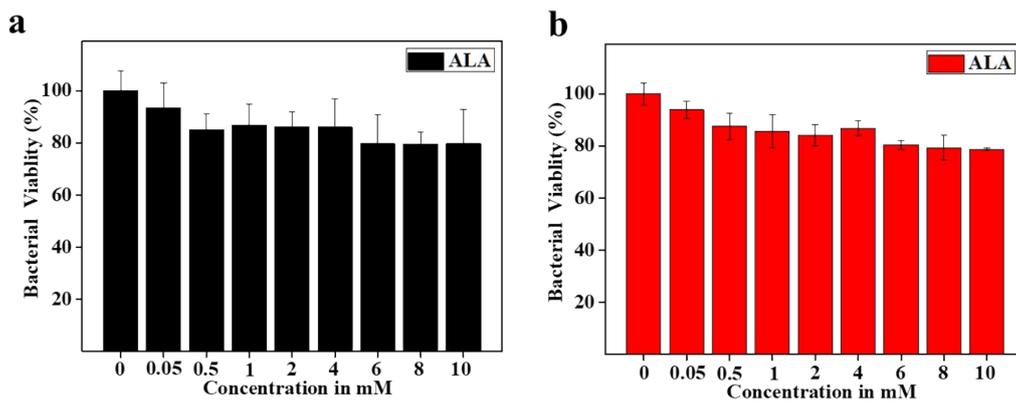


Fig. S2 Bacterial viability of *E. coli* (a) and *S. epidermidis* (b) treated by ALA with different concentrations.

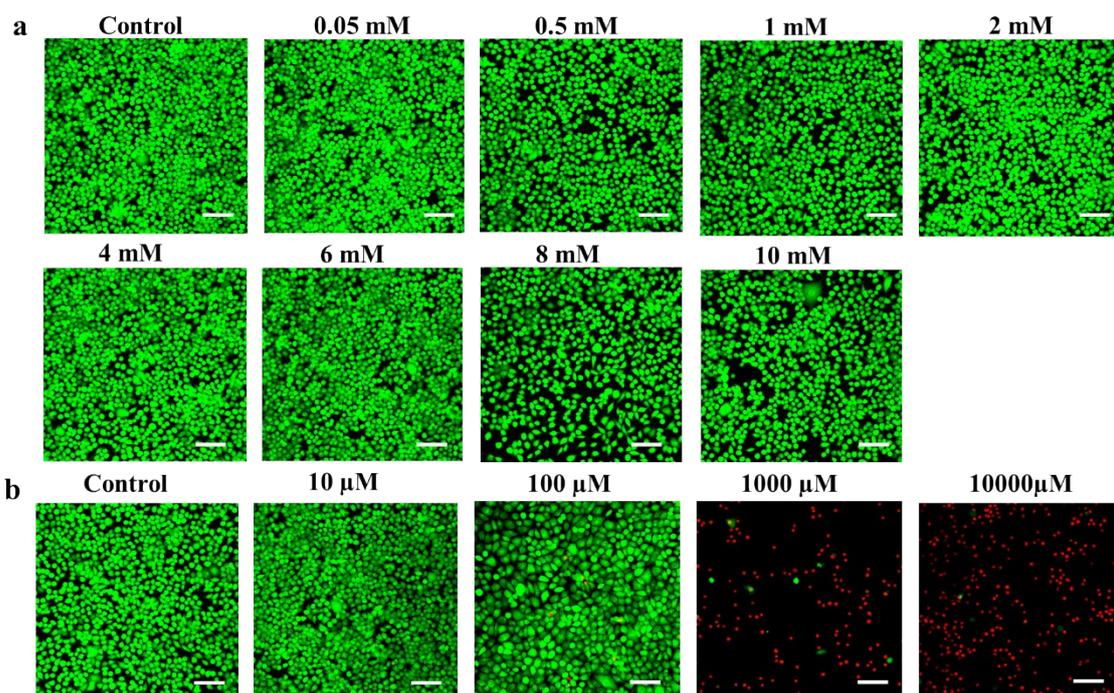


Fig. S3 Fluorescence images of L929 fibroblast cells when treated with ALA (a) and Zn²⁺ (b) with different concentrations (Viable cells are green fluorescent and dead cells are green fluorescent, scale bar=20 μm).

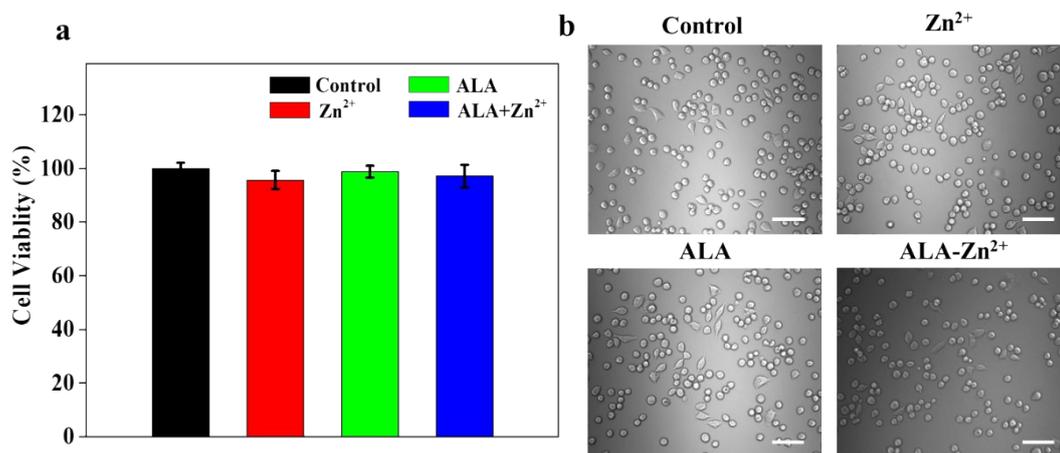


Fig. S4 (a) Cell viability of L929 fibroblast cells treated by ALA, Zn²⁺ and ALA + Zn²⁺. (b) CLSM images of L929 fibroblast cells treated with ALA, Zn²⁺ and ALA + Zn²⁺ under 635 nm laser irradiation (0.1 W/cm² for 1 h), scale bar=100 μm.

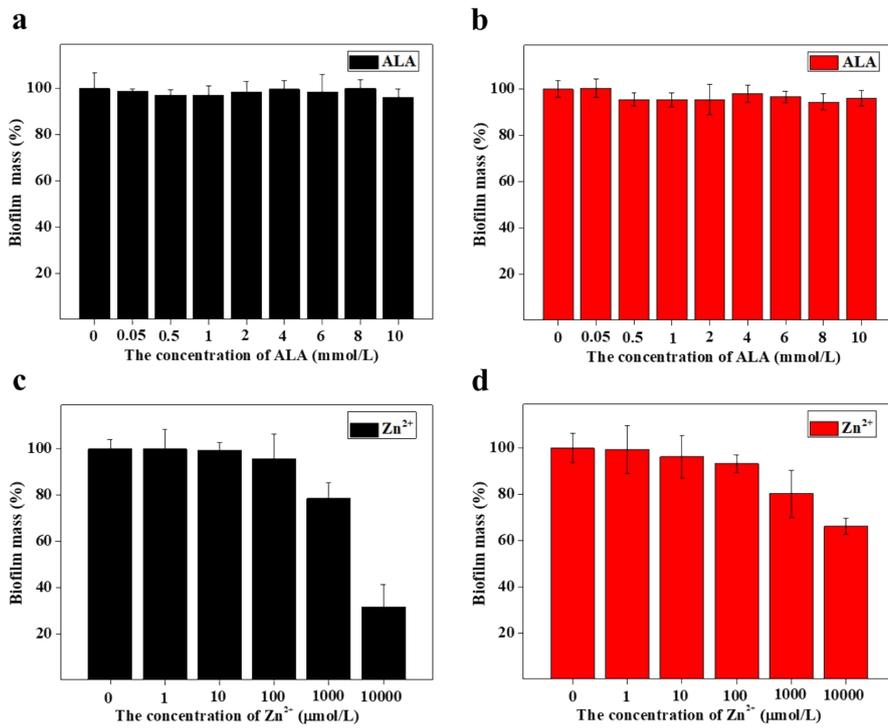


Fig. S5 Biomass of the remaining *S. epidermidis* biofilms treated by ALA (a) and Zn²⁺ (c) by recording the optical density at 550 nm after crystal violet treatment. Quantitative analysis of biofilm inhibitory potency of ALA (b) and Zn²⁺ (d) against *S. epidermidis* by recording the OD 550 of crystal violet-treated biofilms.

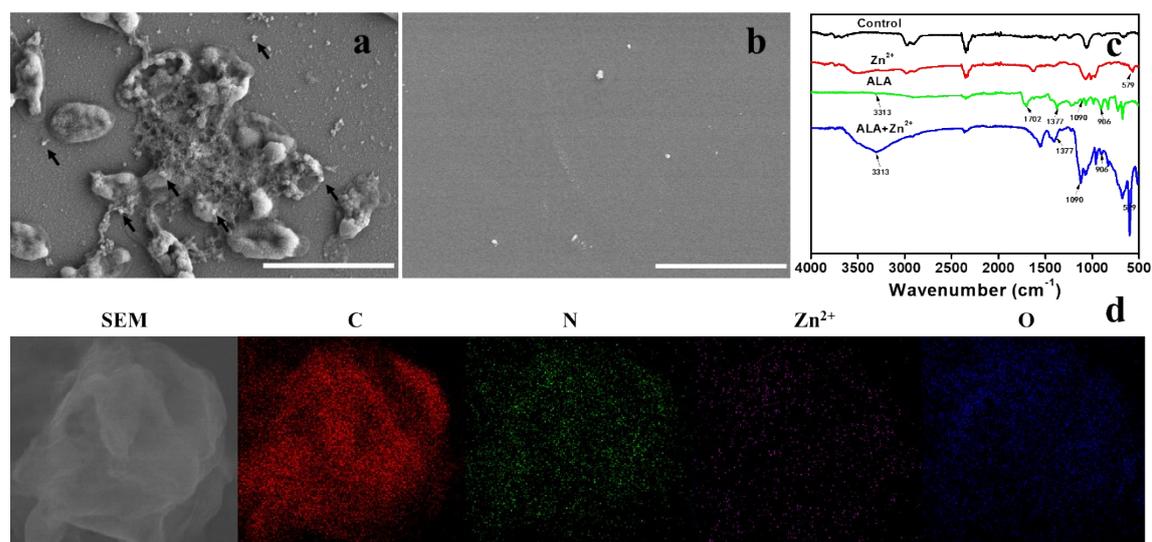


Fig. S6 (a) The SEM images of *E. coli* after being treated by ALA (2 mmol/L) + Zn²⁺ (100 μmol/L) (scale bar = 2 μm). The black arrow indicates the Zn porphyrins produced by the self-combination of ALA and Zn²⁺ in bacteria. (b) The SEM images of Zn porphyrins produced by the self-combination of ALA and Zn²⁺ (scale bar = 2 μm). (c) The Fourier transform infrared (FT-IR) spectra of *S. epidermidis* treated by Zn²⁺ (100 μmol/L), ALA (2 mmol/L) and ALA (2 mmol/L) + Zn²⁺ (100 μmol/L). (d) The EDS analysis of Zn porphyrins produced by self-combination of ALA and Zn²⁺.