

The dual function of impurity on protein crystallization

Jie Liu, Chen-Yan Zhang*, Yue Liu, Xiang-Long Wu, Tuo-Di Zhang, Feng-Zhu Zhao,
Liang-Liang Chen, Xiao-Qian Jin, Jin-Liang He, Da-Chuan Yin*

*Institute for Special Environmental Biophysics, Key Laboratory for Space Bioscience
and Biotechnology, School of Life Sciences, Northwestern Polytechnical University,
Xi'an 710072, Shaanxi, PR China*

The authors declare no conflict of interest.

* To whom correspondence may be addressed.

Chen-Yan Zhang, zhangchenyan@nwpu.edu.cn, Tel: 86-29-88460543, Fax: 86-29-
88460543; Da-Chuan Yin, yindc@nwpu.edu.cn, Tel: 86-29-88460254, Fax: 86-29-
88460254.

Supporting Information

SI Figures		
SI 1	Figure S1. The SDS-PAGE results of crystals and crystallization solution supernatant.	P1
SI 2	Figure S2. Images of concanavalin crystallization droplets.	P2
SI 3	Figure S3. Comparison of lysozyme and catalase hits using different impurities.	P3
SI 4	Figure S4. Comparison of crystallization reproducibility of lysozyme and catalase with additional of impurities with and without sound.	P4
SI 5	Figure S5. Comparison of lysozyme and catalase hits with additional of impurities with and without sound.	P5
SI 6	Figure S6. Comparison of the crystallization success rate of lysozyme under different sound intensities.	P6

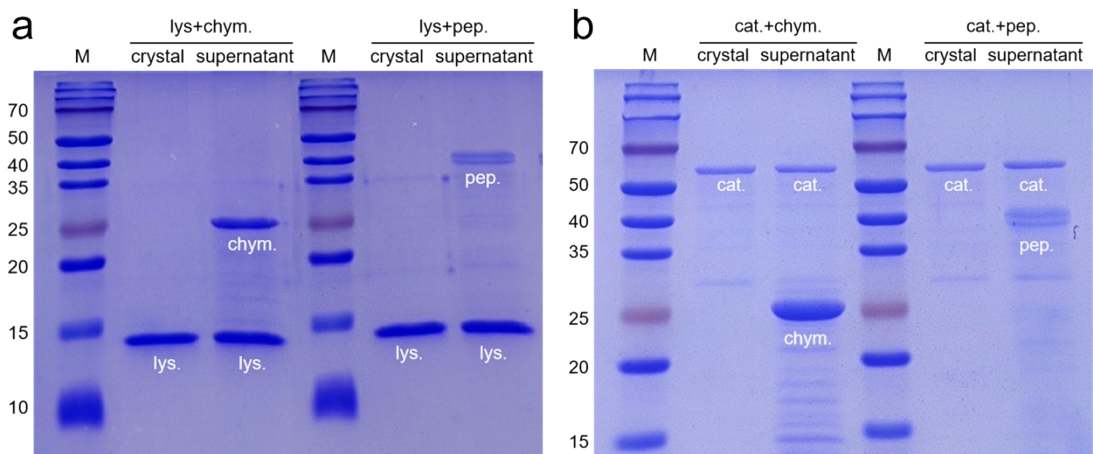


Figure S1. The SDS-PAGE results of crystals and crystallization solution supernatant. (a) 20 mg/ml lysozyme crystallization solution with 10 mg/ml impurities (α -chymotrypsinogen A and pepsin) (b) 8 mg/ml catalase crystallization solution with 4 mg/ml impurities (α -chymotrypsinogen A and pepsin).

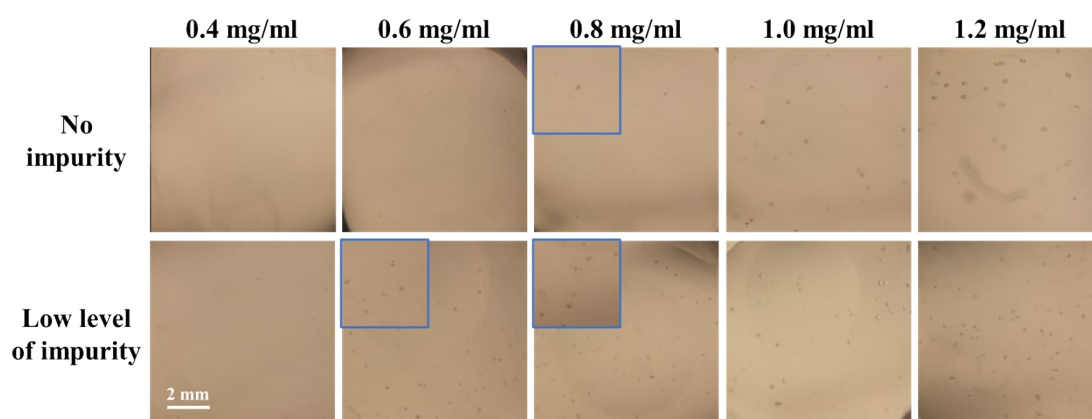


Figure S2. Images of concanavalin crystallization droplets. The concentration of concanavalin was 0.2 mg/ml ~ 1.2 mg/ml. α -chymotrypsinogen A was used as an impurity.

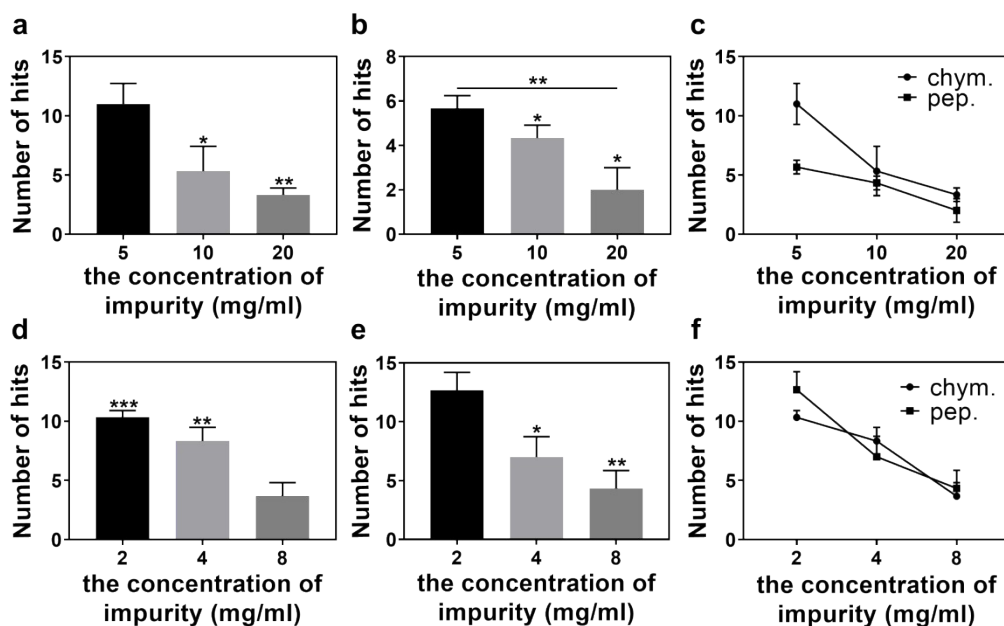


Figure S3. Comparison of lysozyme and catalase hits using different impurities. (a) 20 mg/ml lysozyme with α -chymotrypsinogen A as impurity (5 mg/ml, 10 mg/ml, and 20 mg/ml); (b) 20 mg/ml lysozyme with pepsin as impurity (5 mg/ml, 10 mg/ml, and 20 mg/ml); (c) comparison of effect of impurities on lysozyme hits; (d) 8 mg/ml catalase with α -chymotrypsinogen A as impurity (2 mg/ml, 4 mg/ml, and 8 mg/ml); (e) 8 mg/ml catalase with pepsin as impurity (2 mg/ml, 4 mg/ml, and 8 mg/ml); (f) comparison of effect of impurities on catalase hits. $p < 0.05$ indicated by *, $p < 0.01$ indicated by **, and $p < 0.001$ indicated by ***.

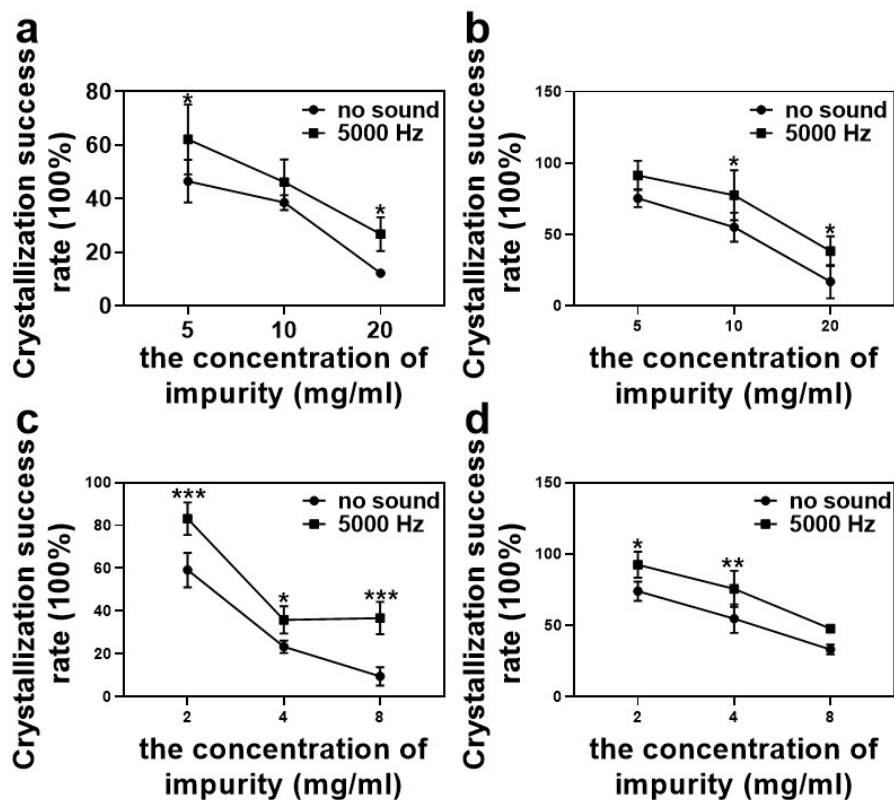


Figure S4. Comparison of crystallization reproducibility of lysozyme and catalase with additional of impurities with and without sound. (a) 20 mg/ml lysozyme, α -chymotrypsinogen A was impurity (its concentration was 5 mg/ml, 10 mg/ml and 20 mg/ml); (b) 20 mg/ml lysozyme, pepsin was impurity (its concentration was 5 mg/ml, 10 mg/ml and 20 mg/ml); (c) 8 mg/ml catalase, α -chymotrypsinogen A was impurity (its concentration was 2 mg/ml, 4 mg/ml and 8 mg/ml); (d) 8 mg/ml catalase, pepsin was impurity (its concentration was 2 mg/ml, 4 mg/ml and 8 mg/ml). $p < 0.05$ indicated by *, $p < 0.01$ indicated by **, and $p < 0.001$ indicated by ***.

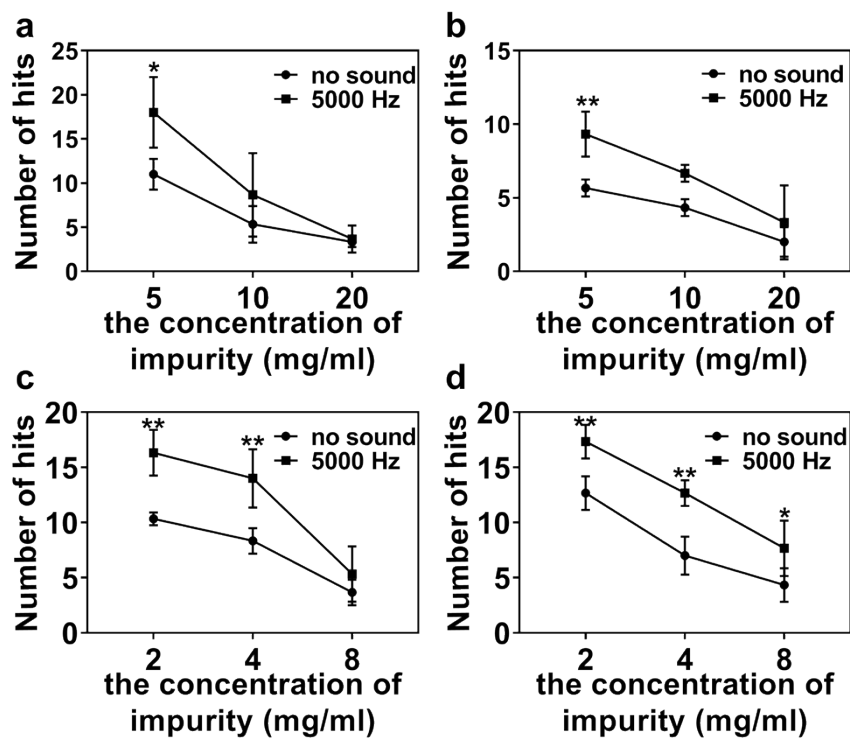


Figure S5. Comparison of lysozyme and catalase hits with additional of impurities with and without sound. (a) 20 mg/ml lysozyme, α -chymotrypsinogen A was impurity (its concentration was 5 mg/ml, 10 mg/ml and 20 mg/ml); (b) 20 mg/ml lysozyme, pepsin was impurity (its concentration was 5 mg/ml, 10 mg/ml and 20 mg/ml); (c) 8 mg/ml catalase, α -chymotrypsinogen A was impurity (its concentration was 2 mg/ml, 4 mg/ml and 8 mg/ml); (d) 8 mg/ml catalase, pepsin was impurity (its concentration was 2 mg/ml, 4 mg/ml and 8 mg/ml). $p < 0.05$ indicated by *, $p < 0.01$ indicated by **.

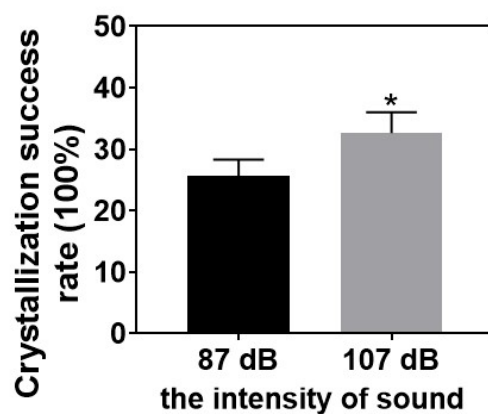


Figure S6. Comparison of the crystallization success rate of lysozyme under different sound intensities. Lysozyme concentration was 20 mg/ml, 20 mg/ml α -chymotrypsinogen A was used as impurities, 80 mg/ml NaCl was crystallization reagent. 5000 Hz audible sound was applied during all the crystallization processes, and the intensity was 87 dB and 107 dB, respectively. $p < 0.05$ indicated by *.