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EDUCATION

2014–2019	**Harvard University**	**Department of Chemistry and Chemical Biology**	**Ph.D., Chemistry**
2010–2014	**Zhejiang University**	**Chu Kochen Honors College**	**B.S., Physics**

ACADEMIC APPOINTMENTS

2024 – Present	**Peking-Tsinghua Center for Life Sciences | Principal Investigator**
2023 – Present	**Peking University | Assistant Professor**
2020 – Present	**Beijing Changping Laboratory | Principal Investigator**
2019 – 2023	**Biomedical Pioneering Innovation Center, Peking University | Research Associate**

AWARDS & HONORS

2025	**Beijing Science and Technology Award in Natural Science (First Prize)**
2024	**Fok Ying Tung Education Foundation Awards for Outstanding Young Investigators**
2024	**DAMO Academy Young Fellow**
2024	**Xplorer Prize**
2023	**Beijing Outstanding Young Talent Award (ZhongGuanCun Award)**
2023	**China's top 10 scientific advances in 2022**
2023	**China's top 10 advances in life sciences in 2022**
2022	**Nature's "Ten people who helped shape science in 2022" (Nature's 10)**
2022	**National Excellent Young Scientists Fund of China**
2022	***MIT Technology Review* Innovators Under 35 China (TR35 China)**

PROFESSIONAL SERVICE

2024 – Present	***Emerging Microbes & Infections* Associate Editor**
2024 – Present	***China CDC Weekly* Youth Editorial Board**
2023 – Present	**The Coalition for Epidemic Preparedness Innovations (CEPI) Scientific Advisory Committee**
2023 – Present	**WHO Technical Advisory Group on COVID-19 Vaccine Composition**

Selected Publications

1. F. Jian[#], J. Wang[#], A. Yisimayi[#], W. Song[#], Y. Xu[#], X. Chen, X. Niu, S. Yang, Y. Yu, P. Wang, H. Sun, L. Yu, J. Wang, Y. Wang, R. An, W. Wang, M. Ma, T. Xiao, Q. Gu, F. Shao, Y. Wang, Z. Shen, R. Jin & **Y. Cao***, *Evolving antibody response to SARS-CoV-2 antigenic shift from XBB to JN.1.* ***Nature*** *637*: 921-929. (2025). **Citation: *53***

2. A. Yisimayi[#], W. Song[#], J. Wang[#], F. Jian[#], Y. Yu[#], X. Chen[#], Y. Xu[#], S. Yang, X. Niu, T. Xiao, J. Wang, L. Zhao, H. Sun, R. An, N. Zhang, Y. Wang, P. Wang, L. Yu, Z. Lv, Q. Gu, F. Shao, R. Jin, Z. Shen, X. S. Xie, Y. Wang & **Y. Cao***, *Repeated Omicron exposures override ancestral SARS-CoV-2 immune imprinting.* ***Nature*** *625*: 148-156. (2024). **Citation: *185.* (Highlighted by Visan, I., "Immune imprinting", *Nature Immunology*)**

3. **Y. Cao***[#], F. Jian[#], J. Wang[#], Y. Yu[#], W. Song[#], A. Yisimayi, J. Wang, R. An, X.Chen, N. Zhang, Y. Wang, P. Wang, L. Zhao, H. Sun, L. Yu, S. Yang, X. Niu, T. Xiao, Q. Gu, F. Shao, X. Xiao, Y. Xu, R. Jin, Z. Shen, Y. Wang* & X. S. Xie*, *Imprinted SARS-CoV-2 humoral immunity induces convergent Omicron RBD evolution.* ***Nature*** 614: 21-529. (2023). **Citation: *751.* (Related commentary: "How your first brush with COVID warps your immunity", *Nature*)**

4. **Y. Cao***[#], A. Yisimayi[#], F. Jian[#], W. Song[#], T. Xiao[#], L. Wang[#], S. Du[#], J. Wang[#], Q. Li[#], X. Chen[#], Y. Yu[#], P. Wang, Z. Zhang, P. Liu, R. An, X. Hao, Y. Wang, J. Wang, R. Feng, H. Sun, L. Zhao, W. Zhang, D. Zhao, J. Zheng, L. Y, C. Li, N. Zhang, R. Wang, X. Niu, S. Yang, X. Song, Y. Chai, Y. Hu, Y. Shi, L. Zheng, Z. Li, Q. Gu, F. Shao, W. Huang, R. Jin, Z. Shen*, Y. Wang*, X. Wang*, J. Xiao* & X. S. Xie*, *BA.2.12.1, BA.4 and BA.5 escape antibodies elicited by Omicron infection.* ***Nature*** 608: 593-602. (2022). **Citation: *1374.* (Related commentary: "Neutralization susceptibility of Omicron lineages", *Nature Reviews Immunology*)**

5. **Y. Cao***[#], J. Wang[#], F. Jian[#], T. Xiao[#], W. Song[#], A. Yisimayi[#], W. Huang[#], Q. Li, P. Wang, R. An, J. Wang, Y. Wang, X. Niu, S. Yang, H. Liang, H. Sun, T. Li, Y. Yu, Q. Cui, S. Liu, X. Yang, S. Du, Z. Zhang, X. Hao, F. Shao, R. Jin, X. Wang*, J. Xiao*, Y. Wang* & X. S. Xie*, *Omicron escapes the majority of existing SARS-CoV-2 neutralizing antibodies.* ***Nature*** 602: 657-663. (2022). **Citation: *1921.* (Related commentary: "Omicron, the great escape artist", *Nature Reviews Immunology*)**

6. Z. Cui[#], P. Liu[#], N. Wang[#], L. Wang[#], K. Fan[#], Q. Zhu[#], K. Wang[#], R. Chen, R. Feng, Z. Jia, M. Yang, G. Xu, B. Zhu, W. Fu, T. Chu, L. Feng, Y. Wang, X. Pei, P. Yang, X. S. Xie, L. Cao*, **Y. Cao***, X. Wang*, *Structural and functional characterizations of infectivity and immune evasion of SARS-CoV-2 Omicron.* ***Cell*** 185(5): 860-871. (2022). **Citation: *407***

7. **Y. Cao**[#], B. Su[#], X. Guo[#], W. Sun[#], Y. Deng[#], L. Bao[#], Q. Zhu, X. Zhang, Y. Zheng, C. Geng, X. Chai, R. He, X. Li, Q. Lv, H. Zhu, W. Deng, Y. Xu, Y. Wang, L. Qiao, Y. Tan, L. Song, G. Wang, X. Du, N. Gao, J. Liu, J. Xiao, X. Su, Z. Du, Y. Feng, C. Qin*, C. Qin*, R. Jin*, X. S. Xie*, *Potent Neutralizing Antibodies against SARS-CoV-2 Identified by High-Throughput Single-Cell Sequencing of Convalescent Patients' B Cells*. ***Cell*** 182: 73-84.e16 (2020). ***Citation: 1285*** **(Top 10 most cited articles from *Cell* in 2020; Related commentary: "Need for Speed: From Human SARS-CoV-2 Samples to Protective and Efficacious Antibodies in Weeks", *Cell*)**

All Publications

1. F. Jian[#], A. Z. Wec[#], L. Feng[#], Y. Yu, L. Wang, P. Wang, L. Yu, J. Wang, J. Hou, D. M. Berrueta, D. Lee, T. Speidel, L. Ma, T. Kim, A. Yisimayi, W. Song, J. Wang, L. Liu, S. Yang, X. Niu, T. Xiao, R. An, Y. Wang, F. Shao, Y. Wang, S. Pecetta, X. Wang*, L. M. Walker*, **Y. Cao***. *Viral evolution prediction identifies broadly neutralizing antibodies to existing and prospective SARS-CoV-2 variants.* ***Nature Microbiology*** (2025). https://doi.org/10.1038/s41564-025-02030-7

2. C. Guo[#], Y. Yu[#], J. Liu, F. Jian, S. Yang, W. Song, L. Yu, F. Shao, **Y. Cao***. *Antigenic and virological characteristics of SARS-CoV-2 variants BA.3.2, XFG, and NB.1.8.1.* ***The Lancet Infectious Diseases*** 25(7):e374-e377 (2025).

3. X. Tan[#,*], Y. Chai[#,*], R. Li[#], B. Zhang[#], H. Li[#], J. Zhang, T. Zhu, W. Wu, L. An, S. Hu, B. Yang, L. Wang, Z. Cao, H.

Zhang, P. Wang, L. Yu, S. Yin, X. Li, F. Shao, J. Huang, J. Li, F. Yang, C. Zhao, J. Guo, L. Zeng, D. Liang, Z. Zou, H. Zheng*, X. Fan*, L. Xie*, **Y. Cao***, H. Yang*. *1 μL, 40min: Multimodal COVID-19 antibody protection evaluation with tip optofluidic immunoassay*. ***hLife*** 3(7): 338-356 (2025).

4. F. Jian, **Y. Cao***. *Deciphering SARS-CoV-2 evolution under antibody immune pressure.* ***Trends in Immunology*** 46(4): 263-265 (2025).

5. J. Liu#, Y. Yu#, S. Yang, F. Jian, W. Song, L. Yu, F. Shao, **Y. Cao***. *Virological and antigenic characteristics of SARS-CoV-2 variants LF.7.2.1, NP.1, and LP.8.1*. ***The Lancet Infectious Diseases*** 25(3): E128-E130 (2025).

6. J. Liu#, Y. Yu#, F. Jian, S. Yang, W. Song, P. Wang, L. Yu, F. Shao, **Y. Cao***. *Enhanced immune evasion of SARS-CoV-2 variants KP.3.1.1 and XEC through N-terminal domain mutations*. ***The Lancet Infectious Diseases*** 25(1): E6-E7 (2025).

7. F. Jian#, J. Wang#, A. Yisimayi#, W. Song#, Y. Xu#, X. Chen, X. Niu, S. Yang, Y. Yu, P. Wang, H. Sun, L. Yu, J. Wang, Y. Wang, R. An, W. Wang, M. Ma, T. Xiao, Q. Gu, F. Shao, Y. Wang, Z. Shen, R. Jin & **Y. Cao***, *Evolving antibody response to SARS-CoV-2 antigenic shift from XBB to JN.1.* ***Nature*** *637*: 921-929. (2025).

8. L. Feng#, Z. Sun#, Y. Zhang#, F. Jian, S. Yang, K. Xia, L. Yu, J. Wang, F. Shao, X. Wang*, **Y. Cao***. *Structural and molecular basis of the epistasis effect in enhanced affinity between SARS-CoV-2 KP.3 and ACE2*. ***Cell Discovery*** 10: 123 (2024).

9. A. Yisimayi, W. Song, J. Wang, F. Jian, Y. Yu, X. Chen, Y. Xu, R. An, Y. Wang, J. Wang, H. Sun, P. Wang, L. Yu, F. Shao, R. Jin, Z. Shen, Y. Wang, **Y. Cao***. *Prolonged Omicron-Specific B Cell Maturation Alleviates Immune Imprinting Induced by SARS-CoV-2 Inactivated Vaccine*. ***Emerging Microbes & Infections*** 13(1): 2412623 (2024).

10. X. Niu#, Z. Li#, J. Wang#, F. Jian, Y. Yu, W. Song, A. Yisimayi, S. Du, Z. Zhang, Q. Wang, J. Wang, R. An, Y. Wang, P. Wang, H. Sun, L. Yu, S. Yang, T. Xiao, Q. Gu, F. Shao, Y. Wang, J. Xiao, **Y. Cao***. *Omicron-specific ultra-potent SARS-CoV-2 neutralizing antibodies targeting the N1/N2 loop of Spike N-terminal domain*. ***Emerging Microbes & Infections*** 13(1): 2412990 (2024).

11. F. Jian, **Y. Cao***. *The delivery device of SARS-CoV-2 mucosal vaccine matters*. ***Nature Immunology*** 25: 1781–1783 (2024).

12. C. Yue, S. Liu, B. Meng*, K. Fan, S. Yang, P. Liu, Q. Zhu, X. Mao, Y. Yu, F. Shao, P. Wang, Y. Wang*, R. K. Gupta*, **Y. Cao***, X. Wang*, *Deletion of V483 in the spike confers evolutionary advantage on SARS-CoV-2 for human adaptation and host-range expansion after a prolonged pandemic.* ***Cell Research*** 34: 739–742 (2024).

13. P. Liu#, C. Yue#, B. Meng#, T. Xiao#, S. Yang#, S. Liu#, F. Jian, Q. Zhu, Y. Yu, Y. Ren, P. Wang, Y. Li, J. Wang, X. Mao, F. Shao, Y. Wang*, R. K. Gupta*, **Y. Cao***, X. Wang*, *Spike N354 glycosylation augments SARS-CoV-2 fitness for human adaptation through structural plasticity.* ***National Science Review*** 11(7): nwae206 (2024).

14. W. Ma#, H. Fu#, F. Jian, **Y. Cao***, M. Li*, *Distinct SARS-CoV-2 populational immune backgrounds tolerate divergent RBD evolutionary preferences.* ***National Science Review*** 11(7): nwae196 (2024).

15. S. Yang#, Y. Yu#, F. Jian, A. Yisimayi, W. Song, J. Liu, P. Wang, Y. Xu, J. Wang, X. Niu, L. Yu, Y. Wang, F. Shao, R. Jin, Y. Wang, **Y. Cao***, *Antigenicity assessment of SARS-CoV-2 saltation variant BA.2.87.1.* ***Emerging Microbes & Infections*** 23(11): e457-e459 (2024).

16. S. Yang#, Y. Yu#, Y. Xu, F. Jian, W. Song, A. Yisimayi, P. Wang, J. Wang, J. Liu, L. Yu, X. Niu, J. Wang, Y. Wang, F. Shao, R. Jin, Y. Wang, **Y. Cao***, *Fast evolution of SARS-CoV-2 BA.2.86 to JN.1 under heavy immune pressure.* ***The Lancet Infectious Diseases*** 24(2): e70-e72 (2024).

17. H. Marcotte#, **Y. Cao**#, F. Zuo#, L. Simonelli#, J. C. Sammartino, M. Pedotti, R. Sun, I. Cassaniti, M. Hagbom, A. P., J. Yang, L. Du, E. Percivalle, F. Bertoglio, M. Schubert, H. Abolhassani, N. Sherina, C. Guerra, S. Borte, N. Rezaei, M. Kumagai-Braesch, Y. Xue, C. Su, Q. Yan, P. He, C. Grönwall, L. Klareskog, L. Calzolai, A. Cavalli, Q. Wang, D. F

Robbiani, M. Hust, Z. Shi, L. Feng, L. Svensson, L. Chen, L. Bao, F. Baldanti, J. Xiao, C. Qin, L. Hammarström, X. Yang, L. Varani, X. S. Xie, Q. Pan-Hammarström*, *Conversion of monoclonal IgG to dimeric and secretory IgA restores neutralizing ability and prevents infection of Omicron lineages.* ***Proceedings of the National Academy of Sciences*** 121(3): e2315354120 (2024).

18. F. Zuo, Y. Cao, R. Sun, A. Yisimayi, L. Du, F. Bertoglio, M. Schubert, C. Guerra, A. Cavalli, M. Hust, D. F Robbiani, H. Abolhassani, X. S. Xie, L. Hammarström, H. Marcotte, Q. Pan-Hammarström*, *Neutralisation activity of mucosal IgA against XBB sublineages and BA. 2.86.* ***The Lancet Infectious Diseases*** 24(1): e7-e9 (2024).

19. A. Yisimayi[#], W. Song[#], J. Wang[#], F. Jian[#], Y. Yu[#], X. Chen[#], Y. Xu[#], S. Yang, X. Niu, T. Xiao, J. Wang, L. Zhao, H. Sun, R. An, N. Zhang, Y. Wang, P. Wang, L. Yu, Z. Lv, Q. Gu, F. Shao, R. Jin, Z. Shen, X. S. Xie, Y. Wang & **Y. Cao***, *Repeated Omicron exposures override ancestral SARS-CoV-2 immune imprinting.* ***Nature*** *625*: 148-156. (2024).

20. F. Jian[#], L. Feng[#], S. Yang[#], Y. Yu[#], L. Wang, W. Song, A. Yisimayi, X. Chen, Y. Xu, P. Wang, L. Yu, J. Wang, L. Liu, X. Niu, J. Wang, T. Xiao, R. An, Y. Wang, Q. Gu, F. Shao, R. Jin, Z. Shen, Y. Wang, X. Wang*, **Y. Cao***, *Convergent evolution of SARS-CoV-2 XBB lineages on receptor-binding domain 455–456 synergistically enhances antibody evasion and ACE2 binding.* ***PLoS Pathogens*** 19(12): e1011868 (2023).

21. **Y. Cao**[#], Y. Bai[#], T. Yuan[#], L. Song, Y. Fan, L. Ren, W. Song, J. Peng, R. An, Q. Gu, Y. Zheng, X. S. Xie*, *Single-cell bisulfite-free 5mC and 5hmC sequencing with high sensitivity and scalability.* ***Proceedings of the National Academy of Sciences*** 120(49): e2310367120 (2023).

22. S. Yang[#], Y. Yu[#], F. Jian, W. Song, A. Yisimayi, X. Chen, Y. Xu, P. Wang, J. Wang, L. Yu, X. Niu, J. Wang, T. Xiao, R. An, Y. Wang, Q. Gu, F. Shao, R. Jin, Z. Shen, Y. Wang, **Y. Cao***, *Antigenicity and infectivity characterization of SARS-CoV-2 BA.2.86.* ***The Lancet Infectious Diseases*** 23(11): e457-e459 (2023).

23. W. Ma, H. Fu, F. Jian, **Y. Cao***, M. Li*, *Immune evasion and ACE2 binding affinity contribute to SARS-CoV-2 evolution.* ***Nature Ecology & Evolution*** 7: 1457-1466 (2023).

24. R. Song, G. Zeng, J. Yu, X. Meng, X. Chen, J. Li, X. Xie, X. Lian, Z. Zhang, **Y. Cao***, W. Yin*, R. Jin*, *Post-exposure prophylaxis with SA58 (anti-SARS-COV-2 monoclonal antibody) nasal spray for the prevention of symptomatic COVID-19 in healthy adult workers: a randomized, single blind, placebo-controlled clinical study.* ***Emerging Microbes & Infections*** 12: e2212806 (2023).

25. X. Chen, Y. Xu, Y. Xie, W. Song, Y. Hu, A. Yisimayi, S. Yang, F. Shao, L. Geng, Y. Wang, H. Gao, Y. Shi, S. Zhang, R. Jin, Z. Shen*, **Y. Cao***, *Protective effect of plasma neutralization from prior SARS-CoV-2 Omicron infection against BA.5 subvariant symptomatic reinfection.* ***The Lancet Regional Health*** 33:100758 (2023).

26. C. Yue, W. Song, L. Wang, F. Jian, X. Chen, F. Gao, Z. Shen, Y. Wang, X. Wang*, **Y. Cao***, *ACE2 binding and antibody evasion in enhanced transmissibility of XBB.1.5.* ***The Lancet Infectious Diseases*** 23(3):278-280 (2023).

27. **Y. Cao***[#], F. Jian[#], J. Wang[#], Y. Yu[#], W. Song[#], A. Yisimayi, J. Wang, R. An, X.Chen, N. Zhang, Y. Wang, P. Wang, L. Zhao, H. Sun, L. Yu, S. Yang, X. Niu, T. Xiao, Q. Gu, F. Shao, X. Xiao, Y. Xu, R. Jin, Z. Shen, Y. Wang* & X. S. Xie*, *Imprinted SARS-CoV-2 humoral immunity induces convergent Omicron RBD evolution.* ***Nature*** 614: 21-529. (2023).

28. **Y. Cao***[#], F. Jian[#], Z. Zhang[#], A. Yisimayi[#], X. Hao[#], L. Bao[#], F. Yuan, Y. Yu, S. Du. J. Wang, T. Xiao, W. Song, Y. Zhang, P. Liu, R. An, P. Wang, Y. Wang, S. Yang, X. Niu, Y. Zhang, Q. Gu, F. Shao, Y. Hu, W. Yin, A. Zheng, Y. Wang, C. Qin*, R. Jin*, X. Xiao* & X. S. Xie*, *Rational identification of potent and broad sarbecovirus-neutralizing antibody cocktails from SARS convalescents.* ***Cell Reports*** 41(12): 111845 (2022).

29. **Y. Cao***[#], W. Song[#], L. Wang[#], P. Liu[#], C. Yue[#], F. Jian[#], Y. Yu, A. Yisimayi, P. Wang, Y. Wang, Q. Zhu, J. Deng, W. Fu, L. Yu, N. Zhang, J. Wang, T. Xiao, R. An, J. Wang, L. Liu, S. Yang, X. Niu, Q. Gu, F. Shao, X. Xiao, B. Meng, R. K. Gupta, R. Jin, Y. Wang, X. S. Xie* & X. Wang*, *Characterization of the enhanced infectivity and antibody evasion of Omicron BA.2.75.* ***Cell Host & Microbe*** 30(11): 1527-1539. (2022).

30. F. Jian[#], Y. Yu[#], W. Song, A. Yisimayi, L. Yu, Y. Gao, N. Zhang, Y. Wang, F. Shao, X. Xiao, Y. Xu, R. Jin, Y. Wang, X. S. Xie* & **Y. Cao***, *Further humoral immunity evasion of emerging SARS-CoV-2 BA.4 and BA.5 subvariants.* ***The Lancet Infectious Diseases*** 22(11): 1535-1537. (2022).

31. **Y. Cao***[#], A. Yisimayi[#], F. Jian[#], W. Song[#], T. Xiao[#], L. Wang[#], S. Du[#], J. Wang[#], Q. Li[#], X. Chen[#], Y. Yu[#], P. Wang, Z. Zhang, P. Liu, R. An, X. Hao, Y. Wang, J. Wang, R. Feng, H. Sun, L. Zhao, W. Zhang, D. Zhao, J. Zheng, L. Y, C. Li, N. Zhang, R. Wang, X. Niu, S. Yang, X. Song, Y. Chai, Y. Hu, Y. Shi, L. Zheng, Z. Li, Q. Gu, F. Shao, W. Huang, R. Jin, Z. Shen*, Y. Wang*, X. Wang*, J. Xiao* & X. S. Xie*, *BA.2.12.1, BA.4 and BA.5 escape antibodies elicited by Omicron infection.* ***Nature*** 608: 593-602. (2022).

32. H. Zheng[#], **Y. Cao*[#]**, X. Chen[#], F. Wang, Y. Hu, W. Song, Y. Chai, Q. Gu, Y. Shi, Y. Feng, S. Liu, Y. Xie, X. S. Xie, W. Jiang, Z. Shen*, *Disease profile and plasma neutralizing activity of post-vaccination Omicron BA.1 infection in Tianjin, China: a retrospective study.* ***Cell Research*** 32: 781-784. (2022).

33. L. Qu[#], Z. Yi[#], Y. Shen[#], L. Lin, F. Chen, Y. Xu, Z. Wu, H. Tang, X. Zhang, F. Tian, C. Wang, X. Xiao, X. Dong, L. Guo, S. Lu, C. Yang, C. Tang, Y. Yang, W. Yu, J. Wang, Y. Zhou, Q. Huang, A. Yisimayi, S. Liu, W. Huang, **Y. Cao**, Y. Wang, Z. Zhou, X. Peng, J. Wang, X. S. Xie, W. Wei*, *Circular RNA vaccines against SARS-CoV-2 and emerging variants.* ***Cell*** 185(10): 1728-1744. (2022).

34. K. K. To, X. Li, D. C. Lung, J. D. Ip, W. Chan, A. W. Chu, C. C. Yip, J. H. Chen, R. W. Poon, H. Tsoi, R. W. Lai, W. To, L. Ren, M. Li, **Y. Cao**, X. S. Xie, D. Jin, K. Yuen*, *False Coronavirus Disease 2019 Cases due to Contamination by Inactivated Virus Vaccine.* ***Clinical Infectious Diseases*** 74: 1485-1488. (2022).

35. **Y. Cao***[#], X. Hao[#], X. Wang[#], Q. Wu[#], R. Song, D. Zhao, W. Song, Y. Wang, A. Yisimayi, W. Wang, W. Zhang, J. Du, H. Yu*, X. S. Xie*, R. Jin*, *Humoral immunogenicity and reactogenicity of CoronaVac or ZF2001 booster after two doses of inactivated vaccine.* ***Cell Research*** 32: 107-109. (2022).

36. **Y. Cao***[#], J. Wang[#], F. Jian[#], T. Xiao[#], W. Song[#], A. Yisimayi[#], W. Huang[#], Q. Li, P. Wang, R. An, J. Wang, Y. Wang, X. Niu, S. Yang, H. Liang, H. Sun, T. Li, Y. Yu, Q. Cui, S. Liu, X. Yang, S. Du, Z. Zhang, X. Hao, F. Shao, R. Jin, X. Wang*, J. Xiao*, Y. Wang* & X. S. Xie*, *Omicron escapes the majority of existing SARS-CoV-2 neutralizing antibodies.* ***Nature*** 602: 657-663. (2022).

37. Z. Cui[#], P. Liu[#], N. Wang[#], L. Wang[#], K. Fan[#], Q. Zhu[#], K. Wang[#], R. Chen, R. Feng, Z. Jia, M. Yang, G. Xu, B. Zhu, W. Fu, T. Chu, L. Feng, Y. Wang, X. Pei, P. Yang, X. S. Xie, L. Cao*, **Y. Cao***, X. Wang*, *Structural and functional characterizations of infectivity and immune evasion of SARS-CoV-2 Omicron.* ***Cell*** 185(5): 860-871. (2022).

38. S. Du[#], P. Liu[#], Z. Zhang[#], T. Xiao, A. Yisimayi, W. Huang, Y. Wang, **Y. Cao***, X. S. Xie*, J. Xiao*, *Structures of SARS-CoV-2 B.1.351 neutralizing antibodies provide insights into cocktail design against concerning variants.* ***Cell Research*** 31: 1130-1133. (2021).

39. **Y. Cao***[#]**,** A. Yisimayi[#], Y. Bai[#], W. Huang[#], X. Li[#], S. Du[#], T. Yuan[#], R. An, J. Wang, T. Xiao, W. Ma, L. Song, Y. Li, X. Li, W. Song, J. Wu, S. Liu, X. Li, Y. Zhang, B. Su, X. Guo, Z. Zhang, Y. Wei, C. Gao, Y. Dou, X. Xu, N. Zhang, Y. Zhang, R. Shi, R. Jin, Y. Ma, B. Lu, Y. Feng*, C. Qin*, Y. Wang*, J. Xiao*, X. S. Xie*, *Humoral immune response to circulating SARS-CoV-2 variants by inactivated and RBD-subunit vaccines.* ***Cell Research*** 31: 732–741. (2021).

40. S. Du[#], **Y. Cao**[#], Q. Zhu[#], P. Yu[#], F. Qi[#], G. Wang, X. Du, L. Bao, W. Deng, H. Zhu, J. Liu, J. Nie, Y. Zheng, H. Liang, R. Liu, S. Gong, H. Xu, A. Yisimayi, Q. Lv, B. Wang, R. He, Y. Han, W. Zhao, Y. Bai, Y. Qu, X. Gao, C. Ji, Q. Wang, N. Gao, W. Huang, Y. Wang, X. S. Xie*, X. Su*, J. Xiao*, C. Qin*, *Structurally Resolved SARS-CoV-2 Antibody Shows High Efficacy in Severely Infected Hamsters and Provides a Potent Cocktail Pairing Strategy*. ***Cell*** 183, 1013-1023.e13 (2020).

41. **Y. Cao**[#], B. Su[#], X. Guo[#], W. Sun[#], Y. Deng[#], L. Bao[#], Q. Zhu, X. Zhang, Y. Zheng, C. Geng, X. Chai, R. He, X. Li, Q. Lv, H. Zhu, W. Deng, Y. Xu, Y. Wang, L. Qiao, Y. Tan, L. Song, G. Wang, X. Du, N. Gao, J. Liu, J. Xiao, X. Su, Z. Du, Y. Feng, C. Qin*, C. Qin*, R. Jin*, X. S. Xie*, *Potent Neutralizing Antibodies against SARS-CoV-2 Identified by*

High-Throughput Single-Cell Sequencing of Convalescent Patients' B Cells. ***Cell*** 182: 73-84.e16 (2020).

42. C. Chen, J. Li, L. Di, Q. Jing, P. Du, C. Song, J. Li, Q. Li, **Y. Cao**, X. S. Xie, A. R. Wu*, H. Zeng*, Y. Huang*, J. Wang*, *MINERVA: A Facile Strategy for SARS-CoV-2 Whole-Genome Deep Sequencing of Clinical Samples.* ***Molecular Cell*** 80: 1123-1134.e4 (2020).

43. H. P. Babcock#, J. R. Moffitt#, **Y. Cao**, X. Zhuang*, *Fast compressed sensing analysis for super-resolution imaging using L1-homotopy*. ***Optics Express*** 21: 28583-28596 (2013).

INVITED PRESENTATIONS

- **Chinese Society for Immunology (CSI) Immunology Frontiers Forum: Molecular Immunology (2025)**
- **PKU Life Sciences 100th Anniversary Immunity Symposium (2025)**
- **The 3rd International Conference on Single-cell and Spatial Omics (2025)**
- **Vaccine Innovation Forum (VIF) World 2025**
- **Cold Spring Harbor Asia conference on Preparing for the Next Pandemic: Evolution, Pathogenesis and Virology of Coronaviruses (2024)**
- **Immunology and Microbiology Symposium of Sun Yat-sen University (IMSYSU 2024)**
- **2024 Annual Meeting of Chinese Society for Immunology/16th CSI Congress of Immunology (2024)**
- **Annual Scientific Meeting 2024 of Hong Kong Chinese Medical Association (2024)**
- **Nanshan Respiratory Health Forum (2024)**
- **15th HOPE Meeting with Nobel Laureates (2024)**
- **CAMS Oxford Institute (COI) seminar series at University of Oxford (2024)**
- **5th CSI/JSI/KAI Joint Symposium on Immunology（2024）**
- **Emerging Microbes & Infections (EMI) Symposium 2023**
- **70 years of DNA Double Helix: Celebration of Breakthroughs in Life Science on the Occasion of Changping Laboratory's 3rd Anniversary (2023)**
- **The 5th International Forum on Single Cell Omics (2023)**
- **The Variants and Vaccines Working Group of the Massachusetts Consortium on Pathogen Readiness (MassCPR) monthly seminar (2023)**
- **VRD Seminar Series for Pfizer (2023)**
- **The 2nd International Frontier Research and Innovation Forum on Coronavirus (RIFC 2023)**
- **HKMA CME Hybrid Symposium on COVID-19 (2023)**
- **The 20th Chinese Biophysics Congress (2023)**
- **Immunology Forum for Moderna (2023)**
- **Program in Cellular and Molecular Medicine (PCMM) 2023 Seminar Series (2023)**
- **The 4th International Forum on Single Cell Omics (2022)**
- **WHO Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE) (2022)**

PATENTS

- **Methylation detection and analysis of mammalian DNA** **ZL201980099399.4**
- **An antibody against SARS-CoV-2 variants and its applications.** **ZL2021109075520**
- **Library preparation for cfDNA methylation sequencing and application.** **ZL202210365172.3**
- **A monoclonal antibody against SARS-CoV-2 and its applications.** **ZL202010177710.7**
- **Methods of Amplifying DNA to Maintain Methylation Status.** **WO/US2020/0063213**