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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 Research Scientist
2019 – 2023	Biomedical Pioneering Innovation Center, Peking University Research Associate

AWARDS & HONORS

2026	State Natural Science Award (Second Prize)
2026	<i>Viruses</i> Early Career Investigator Award
2025	2025 HE Science Foundation Research Fellow
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	<i>MIT Technology Review</i> Innovators Under 35 China (TR35 China)

PROFESSIONAL SERVICE

2026 – Present	<i>Viruses</i> Editorial Board Member
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2026 – Present	Coronavirus Collaborative Open Research Consortium (CORC) theme leader
2024 – Present	<i>Emerging Microbes & Infections</i> Associate Editor
2024 – Present	<i>China CDC Weekly</i> Youth Editorial Board
2023 – Present	The Coalition for Epidemic Preparedness Innovations (CEPI) Scientific Advisory Committee
2023 – Present	Advisor for 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: 161**
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: 289. (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: 950. (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: 1548. (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: 2218. (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: 461**
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: 1339 (Related commentary: “Need for Speed: From Human SARS-CoV-2 Samples to Protective and Efficacious Antibodies in Weeks”, *Cell*)**

All Publications

1. S. Yang[#], X. Luo[#], J. Luo, F. Jian*, **Y. Cao***. *A deep mutational scanning-informed protein language model predicts*

2. Q. Wang[#], H. Li[#], F. Jian, A. Han, Y. Liu, J. Liu, Y. Yu, J. Wang, L. Yu, Y. Wang, H. Sun, M. Ma, F. Shao, L. Zhu*, W. Liu*, **Y. Cao***. Human monoclonal antibodies that target the SFTSV glycoprotein Gn head from four neutralizing epitope groups. *Cell Reports* 45(4):117248 (2026).
3. H. Batra[#], S. Luo*, K. O. Saunders[#], J. S. Higgins[#], F. Jian, J. Zhang, M. G. Kibria, G. M. Jonaid, Q. J. Zhou, A. Eaton, K. Cronin, M. L. Mallory, M. Mattocks, R. J. Edwards, R. Parks, E. M. Lee, A. Y. Ye, A. C. Williams, G. Jung, K. Mansouri, S. M. Alam, D. C. Montefiori, M. Tian, R. S. Baric*, **Y. Cao***, B. F. Haynes*, B. Chen*, F. W. Alt*. Recurrent SARS-CoV-2 Omicron broadly neutralizing humanized antibodies in different single human VH1-2-rearranging mouse models. *Proceedings of the National Academy of Sciences* 123(13): e2537053123 (2026).
4. H. Zhai[#], W. Yu[#], J. Wang[#], J. Deng[#], S. Lei, T. Zhou, Y. Li, K. Xu, M. Ma, R. Feng, Y. Hu, L. Ren*, **Y. Cao***, E. Liu*, X. Wang*. Antibody cocktails based on the occupationally acquired immunity of pediatricians neutralize and confer protection against RSV and hMPV. *Science Translational Medicine* 18(837): ead4170 (2026).
5. Q. Wang, **Y. Cao***. Promising antibody therapeutics for SFTSV infection. *Vita* <https://doi.org/10.15302/vita.2026.01.0001> (2026).
6. Z. Wang^{#,*}, Z. Zhou[#], J. Wang, L. Yang, Z. Zhang, W. Xu, Z. Liu, Y. Ge, L. Yang, X. Wang, P. Yang, Q. Wang, **Y. Cao***, Y. Guo*, H. Tian*. Characterization of the heterogeneity in SARS-CoV-2 fitness dynamics via graph representation learning. *PLoS Computational Biology* 22(1): e1013582 (2026).
7. Y. Zhou[#], X. Meng[#], J. Li[#], G. Zeng, J. Wang, **Y. Cao***, C. Hu*, R. Jin*. Safety, tolerability, and pharmacokinetics of anti-SARS-CoV-2 monoclonal antibody SA55 injection in healthy participants. *Antimicrobial Agents and Chemotherapy* 69(8): e0056825 (2025).
8. 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* 10: 2003-2017 (2025).
9. 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).
10. 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*. Tip optofluidic immunoassay: Evaluating COVID-19 antibody protection with 1 µL fingertip blood. *hLife* 3(7): 338-356 (2025).
11. F. Jian, **Y. Cao***. Deciphering SARS-CoV-2 evolution under antibody immune pressure. *Trends in Immunology* 46(4): 263-265 (2025).
12. 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).
13. 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).
14. 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).
15. C. Hu[#], Y. Zhou[#], X. Meng, J. Li, J. Chen, Z. Ying, X. S. Xie, Y. Hu, **Y. Cao***[‡], R. Jin^{*,‡} Safety and Intranasal Retention of a Broad-Spectrum Anti-SARS-CoV-2 Monoclonal Antibody SA55 Nasal Spray in Healthy Volunteers: A

16. F. Zuo, **Y. Cao**, R. Sun, Q. Wang, L. Simonelli, L. Du, F. Bertoglio, M. Schubert, C. Guerra, A. Cavalli, M. Hust, D. F. Robbiani, L. Varani, H. Abolhassani, X. S. Xie, L. Hammarström, H. Marcotte[#], Q. Pan-Hammarström^{#,*}. *Ultrapotent IgA dimeric antibodies neutralize emerging Omicron variants*. **Journal of Virology** 99:e01740-24 (2025).
17. W. Ma, K. Zhang, **Y. Cao**, M. Li*. *SARS-CoV-2 keeps evolving, so must our research efforts*. **National Science Review** 12(6): nwaf138 (2025).
18. 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).
19. 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).
20. 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).
21. F. Jian, **Y. Cao***. *The delivery device of SARS-CoV-2 mucosal vaccine matters*. **Nature Immunology** 25: 1781–1783 (2024).
22. 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).
23. 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).
24. 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).
25. 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).
26. 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).
27. Z. Jia[#], K. Wang[#], M. Xie[#], J. Wu[#], Y. Hu[#], Y. Zhou^{#,*}, A. Yisimayi, W. Fu, L. Wang, P. Liu, K. Fan, R. Chen, L. Wang, J. Li, Y. Wang, X. Ge, Q. Zhang, J. Wu, N. Wang, W. Wu, Y. Gao, J. Miao, Y. Jiang, L. Qin, L. Zhu, W. Huang, Y. Zhang, H. Zhang, B. Li, Q. Gao, X. S. Xie*, Y. Wang*, **Y. Cao***, Q. Wang*, X. Wang*, *A third dose of inactivated vaccine augments the potency, breadth, and duration of anamnestic responses against SARS-CoV-2*. **Protein & Cell** 15(12):930-937 (2024).
28. 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. Calzolari, 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**

29. 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).
30. 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).
31. . Wang, Y. Li, J. Jin, X. Chai, Z. Ma, J. Duan, G. Zhang, T. Huang, X. Zhang, T. Zhang, H. Wu, **Y. Cao**, B. Su*. *Severe acute respiratory syndrome coronavirus 2-specific T-cell responses are induced in people living with human immunodeficiency virus after booster vaccination*. **Chinese Medical Journal** 137(22):2734-2744 (2024).
32. C. Guo[#], Xin Chai[#], M. Baerlike, Y. Liu, Y. Wang, F. Shao, Q. Huang, W. Zhang, Sh. Cen, Y. Dong, **Y. Cao**, J. Yan, X. Zhou, Z. Hua*, B. Hou*. *Comparison of antigen-specific B cell responses reveals disparity in immunogenicity and memory B cell formation across COVID-19 vaccine platforms*. **hLife** 2(12):625-640 (2024).
33. J. Liu*, G. Wong, H. Li, Y. Yang, Y. Cao, Y. Li, Y. Wu, Z. Zhang, C. Jin, X. Wang, Y. Chen, B. Su, Z. Wang, Q. Wang, **Y. Cao**, G. Chen, Z. Qian, J. Zhao, G. Wu. *Biosafety and immunology: An interdisciplinary field for health priority*. **Biosafety and Health** 6(5):310-318 (2024).
34. 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).
35. **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).
36. 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).
37. 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).
38. 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).
39. 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).
40. 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).
41. F. Zuo, R. Sun, H. Abolhassani, L. Du, Y. Wang, S. Vlachiotis, F. Bertoglio, M. Schubert, N. Rezaei, Z. Chavoshzadeh, C. Guerra, A. Cavalli, J. Andréll, M. Kumagai-Braesch, Y. Xue, **Y. Cao**, M. Hust, D. F. Robbiani, X. S. Xie, L. Hammarström, H. Marcotte, Q. Pan-Hammarström*. *Heterologous inactivated virus/mRNA vaccination response to BF.7, BQ.1.1, and XBB.1*. **The Lancet Regional Health - Western Pacific** 33: 100762 (2023).
42. S. Si, C. Jin, J. Li, **Y. Cao**, B. Kan, F. Xue, X. S. Xie, L. Fang, G. Zeng, S. Zhang*, Y. Hu*, X. Dong*. *Safety and*

Effectiveness of SA58 Nasal Spray Against COVID-19 Infection in Medical Personnel: An Open-Label, Blank-Controlled Study—Hohhot City, Inner Mongolia Autonomous Region, China, 2022. China CDC Weekly 5(10): 218-222 (2023).

43. **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).
44. **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).
45. **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).
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INVITED PRESENTATIONS

- Single-Cell Genomics GRC (2026)
- Vaccine Innovation Forum (VIF) World 2026
- 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

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| ➤ Method for preparing antigen-binding units | ZL202110521323.5 |
| ➤ 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 |