

Yunlong Cao

Biomedical Pioneering Innovation Center, Peking University
No.5 Yiheyuan Road, Peking University, Integrated Science Institute, Beijing, China
yunlongcao@pku.edu.cn; +86 80726688-8753

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

RESEARCH EXPERIENCE

2023 – Present	Peking University Assistant Professor
2021 – Present	Beijing Changping Laboratory Investigator
2019 – 2023	Biomedical Pioneering Innovation Center, Peking University Research Associate

AWARDS & HONORS

2023	The Coalition for Epidemic Preparedness Innovations (CEPI) Scientific Advisory Committee
2023	WHO Technical Advisory Group on COVID-19 Vaccine Composition
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	MIT Technology Review Innovators Under 35 China (TR35 China)

Selected Publications

- NO.1** 2023 Nature
Ayijiang Yisimayi[#], Weiliang Song, Jing Wang, Fanchong Jian, Yuanling Yu, Xiaosu Chen, Yanli Xu, Sijie Yang, Xiao Niu, Tianhe Xiao, Jing Wang, Lijuan Zhao, Haiyan Sun, Ran An, Na Zhang, Yao Wang, Peng Wang, Lingling Yu, Qingqing Gu, Fei Shao, Ronghua Jin, Zhongyang Shen, Xiaoliang Sunney Xie, Youchun Wang, **Yunlong Cao**^{*}. *Repeated Omicron exposures override ancestral SARS-CoV-2 immune imprinting*. **Nature**, <https://doi.org/10.1038/s41586-023-06753-7> (2023).
- NO.2** 2023 Nature
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: 271. (Related commentary: "How your first brush with COVID warps your immunity", *Nature*)
- NO.3** 2022 Nature
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: 824. (Related commentary: “Neutralization susceptibility of Omicron lineages”, *Nature Reviews Immunology*)**

NO.4 2022 Nature

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: 1272. (Related commentary: “Omicron, the great escape artist”, *Nature Reviews Immunology*)**

NO.5 2022 Cell

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: 265**

NO.6 2020 Cell

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: 1104 (Top 10 most cited articles from Cell in 2020; China's top 100 most influential academic papers; Related commentary: “Need for Speed: From Human SARS-CoV-2 Samples to Protective and Efficacious Antibodies in Weeks”, *Cell*)**

Other Publications

NO.1 2023 The Lancet Infectious Diseases

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*, [https://doi.org/10.1016/S1473-3099\(23\)00573-X](https://doi.org/10.1016/S1473-3099(23)00573-X) (2023).

NO.2 2023 Nature Ecology & Evolution

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).

NO.3 2023 The Lancet Regional Health

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).

NO.4 2023 The Lancet Infectious Diseases

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).

NO.5 2023 The Lancet Infectious Diseases

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).

NO.6 2022 Cell Reports

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).

NO.7 2022 Cell Host & Microbe

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).

NO.8 2022 The Lancet Infectious Diseases

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).

NO.9 2022 Cell Research

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).

NO.10 2022 Cell

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).

NO.11 2022 Clinical Infectious Diseases

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).

NO.12 2022 Cell Research

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).

NO.13 2021 Cell Research

S. Du[#], P. Liu[#], Z. Zhang[#], T. Xiao, A. Yasimayi, 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).

NO.14 2021 Cell Research

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).

NO.15 2020 Cell

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). *Citation: 211*

NO.16 2020 Molecular Cell

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).

NO.17 2013 Optics Express

Hazen P. Babcock[#], Jeffrey R. Moffitt[#], **Yunlong Cao**, Xiaowei Zhuang*, *Fast compressed sensing analysis for*

INVITED PRESENTATIONS

- **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)**
- **The 4th International Forum on Single Cell Omics (2022)**
- **WHO Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE) (2022)**