

Pingping Cao, Ph.D.

Personal Data

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Current Position

2021.8-present Postdoctoral associate, Department of Molecular Biology, Princeton University, New Jersey
Advisor: Dr. Nieng Yan

Education

2015-2021 Ph.D. School of Medicine, Tsinghua University, Beijing, China
Structural Biology, Advisor: Dr. Nieng Yan
Thesis: Structural and functional study of the Hedgehog signaling pathway receptor Patched1.

2011-2015 B.S. School of Life Science, Shandong University, Jinan, China
Molecular Biology, Advisor: Dr. Cuijie Kang (Shandong University)
Structural Biology, Advisor: Dr. Nieng Yan

Research Experience

2021-present Postdoctoral research: Department of Molecular Biology, Princeton University
Study of sterol-accelerated ER-associated degradation of HMG-CoA Reductase mediated by Insigs by cryo-EM single-particle analysis and biochemistry.

2015-2021 Graduate research: School of Medicine, Tsinghua University
Structural and functional studies of membrane proteins involved in cholesterol metabolism regulation (SCAP/Insig complex) and transport (Patched1).

2014-2015 Undergraduate research: School of Medicine, Tsinghua University
Intramembrane protease-Signal Peptide Peptidase (SPP) expression and purification. Advisor: Dr. Nieng Yan

2013-2014 Undergraduate research: School of Life Science, Shandong University. Molecular cloning and expression of proteins involved in antimicrobial immunity from *Penaeus chinensis*.

Advisor: Dr. Cuijie Kang (Shandong University)

Publications

(#equal contribution, *corresponding author)

1. Renhong Yan[#], **Pingping Cao**[#], Wenqi Song[#], Hongwu Qian, Ximing Du, Hudson W Coates, Xin Zhao, Yaning Li, Shuai Gao, Xin Gong, Ximing Liu, Jianhua Sui, Jianlin Lei, Hongyuan Yang, Andrew J Brown, Qiang Zhou, Chuangye Yan^{*}, Nieng Yan^{*}. A structure of human Scap bound to Insig-2 suggests how their interaction is regulated by sterols. 2021. ***Science***, 371(6533): eabb2224.
2. Renhong Yan[#], **Pingping Cao**[#], Wenqi Song[#], Yaning Li[#], Tongtong Wang, Hongwu Qian, Chuangye Yan^{*}, Nieng Yan^{*}. Structural basis for sterol sensing by Scap and Insig. 2021. ***Cell Reports***, 35(13):109299.
3. Hongwu Qian[#], **Pingping Cao**[#], Miaohui Hu, Shuai Gao, Nieng Yan^{*}, and Xin Gong^{*}. Inhibition of tetrameric Patched1 by Sonic Hedgehog through an asymmetric paradigm. 2019. ***Nature Communications***, 10, 1-9.
4. Xin Gong[#], Hongwu Qian[#], **Pingping Cao**[#], Xin Zhao, Qiang Zhou, Jianlin Lei, Nieng Yan^{*}. Structural basis for the recognition of Sonic Hedgehog by human Patched1. 2018. ***Science***, 361, eaas8935.
5. Hongwu Qian[#], Xin Zhao, **Pingping Cao**, Jianlin Lei, Nieng Yan^{*}, Xin Gong^{**}. Structure of the Human Lipid Exporter ABCA1. 2017. ***Cell***, 169(7):1228-1239.e10.
6. Xin Gong[#], Hongwu Qian[#], Xinhui Zhou[#], Jianping Wu[#], Tao Wan[#], **Pingping Cao**, Weiyun Huang, Xin Zhao, Xudong Wang, Peiyi Wang, Yi Shi, George F Gao, Qiang Zhou^{*}, Nieng Yan^{*}. Structural Insights into the Niemann-Pick C1 (NPC1)-Mediated Cholesterol Transfer and Ebola Infection. 2016. ***Cell***, 165(6):1467-1478.

Awards

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| 2014 | National encouragement scholarship |
| 2019 | National scholarship of China for graduate students |

Mentoring Experience

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| 2021-present | Mentoring, 1 undergraduate student, Princeton University |
| 2017-2021 | Mentoring, 2 graduate students, Tsinghua University |

Skills

Experimental: Molecular cloning, Membrane protein expression (in mammalian cells, insect cells and *E.coli*), Protein purification and characterization, Protein engineering, Western Blot, Cryo-sample preparation, Cryo-EM single-particle analysis.

Computational: Structural determination (cryoSPARC, RELION), Protein model building (Chimera, Phenix, Coot).