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Professional Positions

2022.09 – present Vice President, Tsinghua University, Beijing, China.

2010.12 - present Professor, School of Life Sciences, Tsinghua University, Beijing, China.

2021.10 – 2022.09 Assistant President, Tsinghua University, Beijing, China.

2021.03 – 2022.10 Dean of Institute of Biomedicine, Tsinghua University, Beijing, China.

2020.07 – 2022.01 Director, Human Resources Office, Tsinghua University, Beijing, China.

2016.04 – 2021.04 Dean, School of Life Sciences, Tsinghua University, Beijing, China.

2009.01 - 2011.07 Tenure-Track Assistant Professor, Department of Molecular Biophysics and Biochemistry, Yale University, New Haven, CT, USA.

2006.06 - 2008.12 Research Scientist, Life Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA.

2001.08 - 2006.05 Postdoctoral Fellow, Life Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA.

Education

1996.08 – 2001.07 Ph.D. in Biophysics, Department of Biological Sciences and Biotechnology, Tsinghua University, Beijing, China.

1992.09 – 1996.07 B.S. in Biological Sciences & Biotechnology, Department of Biological Sciences and Biotechnology, Tsinghua University, Beijing, China.



Honors and Awards

- 2025 Second Prize of the 2025 Ministry of Education Natural Science Award (1st rank)
- 2020 2020 Outstanding Science and Technology Achievement Prize, Chinese Academy of Sciences for his Significant Achievement in Research Group of Plant Immunity Mechanism.
- 2019 2019 Science and Technology Breakthrough Award (with Jijie Chai), School of Life Sciences, Tsinghua University.
- 2019 The project “Structural and functional research on a plant NLR resistosome” (with Jijie Chai and Jianmin Zhou) was selected as “2019 Top Ten Progresses in Life Sciences in China”.
- 2019 1st XPLOER PRIZE, Tencent Foundation.
- 2019 2nd Chinese Cryo-EM Outstanding Contribution Award, Cryo-Electron Microscopy Subsociety of The Biophysical Society of China.
- 2019 Chair-Elected, 2017 Gordon Research Conference on Three-Dimensional Electron Microscopy.
- 2019 Young and Middle-aged Leading Scientists, Engineers and Innovators, Ten Thousand Talent Program, The Ministry of Science and Technology.
- 2018 The National Science Fund for Distinguished Young Scholars, National Science Foundation of China.
- 2018 11th Tan Jiazhen Life Sciences Innovation Award, Tan Jiazhen Life Sciences Foundation.
- 2018 16th "The Best Mentor Like A Friend", Tsinghua University.
- 2018 Beijing Teachers' Role Model.
- 2017 Beijing Outstanding Teacher Award.
- 2016 15th "The Best Mentor Like A Friend", Tsinghua University.
- 2012 Youth One-Thousand Talent Program, State Council of China.
- 2009 Smith Family Award for Excellence in Biomedical Research, the Smith Family Foundation.
- 2005 National Award of Natural Science (2nd rank) by State Council of China.
- 2005 Outstanding Performance Award, Lawrence Berkeley National Laboratory.
(Berkeley Lab's highest award to employee's significant one-time achievement)
- 2004 On the SPOT Recognition Award, Lawrence Berkeley National Laboratory.
- 2001 Distinguished Ph.D. Dissertation Award, Tsinghua University.
(Less than 20 out of 500 Ph.D. Dissertations each year are awarded by the university)



Professional Society Experience

2020 – present	Advisory Board Member, <i>Cell</i> .
2017 - present	Executive Editor, <i>Biochemistry</i> .
2014 - present	Editorial Board Member, <i>Biophysics Reports</i> .
2021 – 2025	Vice President, The Biophysical Society of China.
2020 – 2023	Vice President, Chinese Electron Microscopy Society.
2020 – 2023	Editorial Board Member, <i>Ultramicroscopy</i> .
2018 – 2023	Council Member, China Instrument and Control Society.
2017 - 2025	Chair, Cryo-Electron Microscopy Subsociety of The Biophysical Society of China.
2017 – 2021	Executive Editor, <i>Biochemistry</i> .
2017 – 2021	Editorial Board Member, <i>Journal of Biological Chemistry</i> .
2013 – 2021	Council Member, The Biophysical Society of China.
2012 – 2020	Council Member, Chinese Electron Microscopy Society.
2009 – 2019	Member and Reviewer, Faculty of 1000, Cytoskeleton Section.
2009 – present	Member, American Physical Society.
2005 – present	Member, Sigma Xi Society.
2002 – present	Member, Biophysical Society.

Ad Hoc Reviewers for Human Frontier Science Program; Netherland Organization for Scientific Research; Jeffress Research Grant; Indo-US Science and Technology Forum; *Cell*, *Nature*, *Science*, *Nature Structural & Molecular Biology*, *Genes & Development*, *PNAS*, *Journal of Molecular Biology*, *Structure*, *Journal of Structural Biology*, *Experimental Cell Research*.

Research Interests

Our research group is devoted to elucidating the architecture and mechanism of macromolecular complexes and assemblies using cryo-electron microscopy (cryo-EM) combined with other biophysical and biochemical techniques. More specifically, we are interested in the methodology development for more efficient and high resolution cryo-electron microscopy, the mechanism and regulations of nucleic acid quality control, and the coordination mechanisms of cytoskeleton and membrane systems.

Publications

1. Lian Y, Wang A, Lin R, Ke X, Zhan X, Lu R, Qian T, Ghosh A, Ong AAL, Toh DFK, Patil KM, Krishna MS, Dezanet C, Decout JL, Maiti S, **Wang HW**, Chen G*. (2025) A dual-affinity peptide nucleic acid for targeting miRNA-21 precursor rescues tumor



- repressor PTEN expression. *Cell Rep Phys Sci.*, 6(11).
- Zheng LM, Xia Y, Jia X, Gao M, Liu N*, Song J, Li XP, Zhao X, Gao X, Zhou W, Kang W, Yang L, Wang Q, Gao Y*, **Wang HW***, Peng HL*. (2025) Cryo-electron tomography reconstructs polymer in liquid film for fab-compatible lithography. *Nat Commun.*, 16(1):8671.
 - Huang MT, Ma JY, Fu XY, **Wang HW**, Shen Y*, Li XM*. (2025) Accurate helical parameter estimation based on cylindrical unrolling. *Structure*, 33(9):1603-1613.
 - Fan JJ, Yang Z, Liang L, Wang J, **Wang HW***, Ouyang Z*, Zhou XY*. (2025) Electro-spray-based sample preparation for high-resolution protein structure elucidation by cryo-EM. *Clin Transl Med.*, 15(8):e70405.
 - Cao N, Wang J*, Deng T, Fan B, Su S, Ma JB*, **Wang HW***. (2025) Structural basis of endo-siRNA processing by Drosophila Dicer-2 and Loqs-PD. *Nucleic Acids Res.*, 53(4):gkaf102.
 - Su JY, Tian XY, Cheng H, Liu DS, Wang ZY, Sun S*, **Wang HW***, Sui SF*. (2025) Structural insight into synergistic activation of human 3-methylcrotonyl-CoA carboxylase. *Nat Struct Mol Biol.*, 32(1):73-85.
 - Shao XY, Tian M, Yin J, Duan H, Tian Y, Wang H, Xia C, Wang Z, Zhu Y, Wang Y, Chaihu L, Tan M, **Wang HW**, Huang Y, Wang JB*, Wang GB*. (2024) Biofunctionalized dissolvable hydrogel microbeads enable efficient characterization of native protein complexes. *Nat Commun.*, 15(1):8633.
 - Lu RG, Deng L, Lian Y, Ke X, Yang L, Xi K, Ong A, Chen Y, Zhou H, Meng Z, Lin R, Fan S, Liu Y, Toh DF, Zhan X, Krishna MS, Patil KM, Lu Y, Liu Z, Zhu L, **Wang HW**, Li GB*, Chen G*. (2024) Recognition of RNA secondary structures with a programmable peptide nucleic acid-based platform. *Cell Rep Phys Sci.*, 5(9).
 - Zheng, LM, Xu J, Wang W, Gao X, Zhao C, Guo W, Sun L, Cheng H, Meng F, Chen B, Sun W, Jia X, Zhou X, Wu K, Liu Z, Ding F, Liu N*, **Wang HW***, Peng HL*. (2024) Self-assembled superstructure alleviates air-water interface effect in cryo-EM. *Nat Commun.*, 15(1):7300.
 - Liu N, **Wang HW***. (2024) Graphene in cryo-EM specimen optimization. *Curr Opin Struct Biol.*, 86:102823.
 - Yang Z, Fan J, Wang J, Fan X, Ouyang Z*, **Wang HW***, Zhou XY*. (2024) Electro-spray-assisted cryo-EM sample preparation to mitigate interfacial effects. *Nat*



- Methods*, 21(6):1023-1032.
12. Xu J, Gao XY, Zheng LM, Jia X, Xu K, Ma Y, Wei XD, Liu N*, Peng HL*, **Wang HW***. (2024) Graphene sandwich-based biological specimen preparation for cryo-EM analysis. *Proc Natl Acad. Sci USA*, 121(5):e2309384121.
 13. Ji QS, Zhang K, Cao N, You X, Cao S, Wang M, Guo J, **Wang HW**, Mei KR*. (2023) Highly efficient overexpression and purification of multisubunit tethering complexes in *Saccharomyces cerevisiae*. *Protein Expr Purif.*, 212:106351.
 14. Zhou J, Wang A, Song Y, Liu N, Wang J, Li Y, Liang X, Li GH, Chu HY*, **Wang HW***. (2023) Structural insights into the mechanism of GTP initiation of microtubule assembly. *Nat Commun.*, 14(1):5980.
 15. Liu SM, Wang J, Song B, Gong XQ, Liu HH, Hu QL, Zhang JH, Li QQ, Zheng J, **Wang HW***, Xu HE*, Li JY*, Wang B*. (2023) Conformational Dynamics of the D53-D3-D14 Complex in Strigolactone Signaling. *Plant Cell Physiol.*, 64(9):1046-1056.
 16. Liu N, **Wang HW***. (2023) Better cryo-EM specimen preparation: How to deal with the air-water interface? *J Mol Biol.*, 435(9):167926 (Review).
 17. Cheng H, Zheng LM, Liu N, Huang CY, Xu J, Lu Y, Cui XY, Xu K, Hou Y, Tang JC, Zhang Z, Li J, Ni XD, Chen YN*, Peng HL*, **Wang HW***. (2023) Dual-Affinity Graphene Sheets for High-Resolution Cryo-Electron Microscopy. *J Am Chem. Soc.*, 145(14):8073-8081.
 18. You X, Zhang X, Cheng J, Xiao YN, Ma JF, Sun S, Zhang XZ*, **Wang HW***, Sui SF*. (2023) In situ structure of the red algal phycobilisome-PSII-PSI-LHC megacomplex. *Nature*, 616(7955):199-206.
 19. Zheng LM, Liu N*, Gao XY, Zhu WQ, Liu K, Wu C, Yan R, Zhang JC, Gao X, Yao YT, Deng B, Xu J, Lu Y, Liu, ZM, Li MS, Wei XD*, **Wang HW***, Peng HL*. (2023) Uniform thin ice on ultraflat graphene for high-resolution cryo-EM. *Nat Methods*, 20(1):123-130.
 20. Lu Y, Liu N*, Liu Y, Zheng LM, Yang JH, Wang J, Jia X, Zi QR, Peng HL*, Rao Y*, **Wang HW***. (2022) Functionalized graphene grids with various charges for single-particle cryo-EM. *Nat Commun.*, 13(1):6718.
 21. Yan A, Xiong J, Zhu J, Li X, Xu S, Feng X, Ke X, Wang Z, Chen Y, **Wang HW**, Zhang MQ*, Kee K*. (2022) DAZL regulates proliferation of human primordial germ cells by direct binding to precursor miRNAs and enhances DICER processing activity. *Nucleic Acids Res.*, 50(19):11255-11272.



22. Su S, Wang J, Deng T, Yuan X, He J, Liu N, Li XM, Huang Y, **Wang HW***, Ma JB*. (2022) Structural insights into dsRNA processing by *Drosophila* Dicer-2-Loqs-PD. *Nature*, 607(7918):399-406.
23. Huang Y, Zhang X, **Wang HW**, Yu L*. (2022) Assembly of Tetraspanin-enriched macrodomains contains membrane damage to facilitate repair. *Nat Cell Biol.*, 24(6):825-832.
24. Wang X, Hu CX, Ye W, Wang J, Dong X, Xu J, Li X, Zhang M, Lu H, Zhang F, Wu W, Dai S, **Wang HW***, Chen Z*. (2022) Structure of Rift Valley fever virus RNA-dependent RNA polymerase. *J Virol.*, 96(3):e0171321.
25. Wang HW*. (2022) A commentary of "Cryo-EM achieves atomic resolution" in 10 remarkable discoveries from 2020 in *Nature*. *Fundam Res.*, 2(2):349-350. (Commentary)
26. Xu JF, Zhao LY, Peng SJ, Chu HY, Liang R, Tian M, Connell PP, Li G, Chen CL*, **Wang HW***. (2021) Mechanisms of distinctive mismatch tolerance between Rad51 and Dmc1 in homologous recombination. *Nucleic Acids Res.*, 49(22): 13135–13149.
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28. Chen J, Liu N, Huang Y, Wang Y, Sun Y, Wu Q, Li D, Gao S, **Wang HW***, Huang N*, Qi X*, Wang XD*. (2021) Structure of PDE3A-SLFN12 complex and structure-based design for a potent apoptosis inducer of tumor cells. *Nat Commun.*, 12(1):6204.
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34. Xu J, Cui XY, Liu N, Chen YN*, **Wang HW***. (2021) Structural engineering of graphene for high-resolution cryo-electron microscopy. *SmartMat.*, 2:202–212 (Review).
35. Xu K, Liu N, Xu J, Guo CL, Zhao LY, **Wang HW**, Zhang QF*. (2021) VRmol: an Integrative Web-Based Virtual Reality System to Explore Macromolecular Structure. *Bioinformatics*, 37(7):1029-1031.
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37. Liu K, Tan S, Niu S, Wang J, Wu L, Sun H, Zhang Y, Pan X, Qu X, Du P, Meng Y, Jia Y, Chen Q, Deng C, Yan J, **Wang HW**, Wang Q*, Qi J*, Gao G*. (2021) Cross-species recognition of SARS-CoV-2 to bat ACE2. *Proc Natl Acad Sci USA*, 118(1):e2020216118.
38. Liu JL, Wang SB, Liu N, Yang DR, **Wang HW***, Hu HS*, Zhuang J, Wang X*. (2021) Au-Polyoxometalates A-B-A-B Type Copolymer-Analogue Sub-1 nm Nanowires. *Small*, 17(4):e2006260.
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41. Wu LL, Chen Q, Liu KF, Wang J, Han PC, Zhang YF, Hu Y, Meng YM, Pan XQ, Qiao CP, Tian SY, Du P, Song H, Shi WF, Qi JX, **Wang HW***, Yan JH*, Gao GF, Wang QH*. (2020) Broad host range of SARS-CoV-2 and the molecular basis for SARS-CoV-2 binding to cat



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 45. Shen W, Wang QW, Liu YN, Marchetto MC, Linker S, Lu SY, Chen Y, Liu C, Guo C, Xing Z, Shi W, Kelsoe JR, Alda M, **Wang HW**, Zhong Y, Sui SF, Zhao M, Yang Y, Mi S, Cao L, Gage FH*, Yao J*. (2020) Synaptotagmin-7 is a key factor for bipolar-like behavioral abnormalities in mice. *Proc Natl Acad Sci USA*, 117(8):4392-4399.
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 47. Zheng L, Chen Y, Li N, Zhang J, Liu N, Liu J, Dang W, Deng B, Li Y, Gao X, Tan C, Yang Z, Xu S, Wang M, Yang H, Sun L, Cui Y, Wei X, Gao P*, **Wang HW***, Peng H*. (2020) Robust ultraclean atomically thin membranes for atomic-resolution electron microscopy. *Nat Commun.*, 11(1):541.
 48. Liu JJ*, **Wang HW***. (2020) Cryo-Electron Microscopy of Endogenous Yeast Exosomes. *Methods Mol Biol.*, 2062:401-415. (Book Chapter)
 49. Hu Y, Desimmie BA, Nguyen HC, Ziegler SJ, Cheng TC, Chen J, Wang J, **Wang HW**, Zhang K, Pathak VK*, Xiong Y*. (2019) Structural basis of antagonism of human APOBEC3F by HIV-1 Vif. *Nat Struct Mol Biol.*, 26(12):1176-1183.
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 51. Dai A, Yu L*, **Wang HW***. (2019) WHAMM initiates autolysosome tubulation by promoting actin polymerization on autolysosomes. *Nat Commun.*, 10(1): 3699.
 52. **Wang HW***, Fan X. (2019) Challenges and opportunities in cryo-EM with phase plate. *Curr Opin Struct Biol.*, 58:175-182. (Review)



53. Zhang R, Qu X, Zhang M, Jiang Y, Dai A, Zhao W, Cao D, Lan Y, Yu R, **Wang HW**, Huang S*. (2019) The Balance between Actin-Bundling Factors Controls Actin Architecture in Pollen Tubes. *iScience*, 16:162-176.
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58. Wang J, Hu M, Wang J, Qi J, Han Z, Wang G, Qi Y, **Wang HW***, Zhou JM*, Chai J*. (2019) Reconstitution and structure of a plant NLR resistosome conferring immunity. *Science*, 364(6435). pii: eaav5870.
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