Hong-Wei Wang

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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

2020	Outstanding Science and Technology Achievement Prize, Chinese Academy of Sciences for the 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 XPLORER 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)
1996	Distinguished Graduation Award, Tsinghua University.

Curriculum Vitae Hong-Wei Wang

Professional Society Experience

2020 – present	Editorial Board Member, *Ultramicroscopy*.
2020 – present	Advisory Board Member, *Cell.*
2014 - present	Editorial Board Member, *Biophysics Reports.*
2021 – 2025	Vice President, The Biophysical Society of China.
2020 – 2023	Vice President, Chinese Electron Microscopy Society.
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, *Biochemistry.*
2017 – 2021	Editorial Board Member, *Journal of Biological Chemistry.*
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. 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.

2. 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.

3. 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.

4. 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 Reports Physical Science***, 5(9).

5. 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.

6. Liu N, **Wang HW***. (2024) Graphene in cryo-EM specimen optimization. ***Curr Opin Struct Biol.,*** 86:102823.

7. Yang Z, Fan J, Wang J, Fan X, Ouyang Z*, **Wang HW***, Zhou XY*. (2024) Electrospray-assisted cryo-EM sample preparation to mitigate interfacial effects. ***Nat Methods***, 21(6):1023-1032.

8. 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.

9. 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.

10. 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.

11. 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.

12. 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).

13. 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.

14. 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.

15. 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.

16. 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.

17. 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.

18. 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.

19. 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.

20. 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.

21. Wang HW*. (2021) A commentary of "Cryo-EM achieves atomic resolution" in 10 remarkable discoveries from 2020 in *Nature*. ***Fundam Res.,*** 2(2):349-350. (Commentary)

22. 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.

23. Zhang J, Jia K, Huang Y, Wang Y, Liu N, Chen YN, Liu X, Liu X, Zhu Y, Zheng L, Chen H, Liang F, Zhang M, Duan X, **Wang HW**, Lin L*, Peng HL*, Liu ZF*. (2021) Hydrophilic,

Clean Graphene for Cell Culture and Cryo-EM Imaging. ***Nano Lett.,*** 21(22):9587-9593.

24. 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.

25. Zheng L, Liu N, Liu Y, Li N, Zhang J, Wang C, Zhu W, Chen Y, Ying D, Xu J, Yang Z, Gao X, Tang J, Wang X, Liang Z, Zou R, Li Y, Gao P, Wei X*, **Wang HW***, Peng HL*. (2021) Atomically Thin Bilayer Janus Membranes for Cryo-electron Microscopy. ***ACS Nano,*** 15(10):16562-16571.

26. Niu S, Wang J, Bai B, Wu L, Zheng A, Chen Q, Du P, Han P, Zhang Y, Jia Y, Qiao C, Qi J, Tian WX*, **Wang HW***, Wang Q*, Gao GF*. (2021) Molecular basis of cross-species ACE_2 interactions with SARS-CoV-2-like viruses of pangolin origin. ***EMBO J.,*** 40(16):e107786.

27. Nie J, Xie J, Liu S, Wu J, Liu C, Li J, Liu Y, Wang M, Zhao H, Zhang Y, Yao J, Chen L, Shen Y, Yang Y, **Wang HW***, Wang Y*, Huang W*. (2021) Three epitope-distinct human antibodies from RenMab mice neutralize SARS-CoV-2 and cooperatively minimize the escape of mutants. ***Cell Discov.,*** 7(1):53.

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31. 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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35. Liu N, Dong XL, Hu CX, Zeng J, Wang JW, Wang J, **Wang HW***, Belfort M*. (2020) Exon and protein positioning in a pre-catalytic group II intron RNP primed for splicing. ***Nucleic Acid Res.***, 48(19):11185-11198.

36. Liu JL, Liu N, **Wang HW***, Shi WX*, Zhuang J, Xun Wang*. (2020) Hybrid MoO_3-Polyoxometallate Sub-1 nm Nanobelt Superstructures. ***J Am Chem Soc.***, 142(41):17557-17563.

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38. Jin W, Wang J, Liu CP, **Wang HW***, Xu RM*. (2020) Structural Basis for pri-miRNA Recognition by Drosha. ***Mol Cell,*** 78(3): 423-433.

39. Wang J, Song X, Zhang D, Chen X, Li X, Sun Y, Li C, Song Y, Ding Y, Ren R, Harrington EH, Hu LA, Zhong W, Xu C, Huang X, **Wang HW***, Ma Y*. (2020) Cryo-EM structures of PAC1 receptor reveal ligand binding mechanism. ***Cell Res.,*** 30(5): 436-455.

40. Yuan D, Liu Z, Kaindl J, Maeda S, Zhao J, Sun X, Xu J, Gmeiner P*, **Wang HW***, Kobilka BK*. (2020) Activation of the α_{2B} adrenoceptor by the sedative sympatholytic dexmedetomidine. ***Nat Chem Biol.,*** 16(5): 507-+.

41. 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.

42. Liu C, Ma J, Wang J, **Wang HW**, Zhang L*. (2020) Cryo-EM Structure of a Bacterial Lipid Transporter YebT. ***J Mol Biol.,*** 432(4):1008-1019.

43. 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.

44. Liu JJ*, **Wang HW***. (2020) Cryo-Electron Microscopy of Endogenous Yeast Exosomes. ***Methods Mol Biol.,*** 2062:401-415. (Book Chapter)

45. 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.

46. Carragher B, Cheng Y, Frost A, Glaeser RM*, Lander GC, Nogales E, **Wang HW**. (2019) Current outcomes when optimizing 'standard' sample preparation for single-particle cryo-EM. ***J Microsc.,*** 276(1):39-45.

47. Dai A, Yu L*, **Wang HW***. (2019) WHAMM initiates autolysosome tubulation by promoting actin polymerization on autolysosomes. ***Nat Commun.,*** 10(1): 3699.

48. **Wang HW***, Fan X. (2019) Challenges and opportunities in cryo-EM with phase plate. ***Curr Opin Struct Biol.,*** 58:175-182. (Review)

49. 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.

50. Fan X, Wang J, Zhang X, Yang Z, Zhang JC, Zhao L, Peng HL, Lei J*, **Wang HW***. (2019) Single particle cryo-EM reconstruction of 52 kDa streptavidin at 3.2 Angstrom resolution. ***Nat Commun.,*** 10(1):2386.

51. Liu Y, Hu H, Wang J, Zhou Q, Wu P, Yan N, **Wang HW**, Wu JW, Sun L*. (2019) Cryo-EM structure of L-fucokinase/GDP-fucose pyrophosphorylase (FKP) in Bacteroides fragilis. ***Protein Cell***, 10(5):365-369.

52. **Wang HW***. (2019) A Link between Intronic Polyadenylation and HR Maintenance Discovered. ***Biochemistry***, 58(14):1835-1836.

53. Wang J, Wang J, Hu M, Wu S, Qi J, Wang G, Han Z, Qi Y, Gao N, **Wang HW***, Zhou JM*, Chai J*. (2019) Ligand-triggered allosteric ADP release primes a plant NLR complex. ***Science***, 364(6435). pii: eaav5868.

54. 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.

55. Liu N, Zhang J, Chen Y*, Liu C, Zhang X, Xu K, Wen J, Luo Z, Chen S, Gao P, Jia K, Liu Z, Peng H*, **Wang HW***. (2019) Bioactive Functionalized Monolayer Graphene for High-Resolution Cryo-Electron Microscopy. ***J Am Chem Soc.,*** 141(9):4016-4025.

56. Li XM, Lei JL*, and **Wang HW***. (2018) The application of CorrSight™ in correlative light and electron microscopy of vitrified biological specimens. ***Biophys Rep.,*** 4(3):143-152.

57. Liu Z, Wang J, Cheng H, Ke X, Sun L, Zhang Q, **Wang HW***. (2018) Cryo-EM Structure of Human Dicer and Its Complexes with a Pre-miRNA Substrate. ***Cell***, 173(5):1191-1203.

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