

Chuchu Wang, Ph.D.

Nanyang Assistant Professor (2025 Nov.- Present)

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EDUCATION AND TRAINING

Howard Hughes Medical Institute at Stanford University, USA.	2020-2025 Oct.
Postdoctoral Scientist in Prof. Axel T. Brunger Lab (website)	
Interdisciplinary Research Center on Biology and Chemistry, CAS, China	2013-2019
Ph.D. of Cell Biology in Prof. Cong Liu Lab (website)	
Department of Chemistry at Rutgers University, USA.	2012 Fall
Exchange student in Prof. Darrin York Lab	
Jilin University, China	2009-2013
B.S. of <i>Tang AoQing</i> Honors Program in Chemistry and Life Science	

MAJOR RESEARCH INTERESTS

Molecular mechanisms of synaptic dysfunction in neurodegenerative diseases and ageing, with a focus on protein–lipid interactions, using cryo-electron microscopy/tomography and mass spectrometry-based multi-omics.

AWARDS, HONORS AND FELLOWSHIPS

Nanyang Assistant Professorship	2025
The Sammy Kuo Awards in Neuroscience	2024
Award for Outstanding Report of the 3rd Eastern China Structural Biology Conference	2018
The Honorary Title of Excellent Student Leader of the University of Chinese Academy of Sciences	2017
The Honorary Title of Pacemaker to Merit Student of the University of Chinese Academy of Sciences	2015
The Honorary Title of Merit Student of the University of Chinese Academy of Sciences	2014
Chinese Academy of Sciences Undergraduate Scholarship	2013

SELECTED PRESENTATIONS

Oral presentation in Asian Young Scholar Forum at CUHK, Hong Kong, China	01/2026
Oral presentation at the 69 th Annual Meeting of Biophysical Society, Los Angeles, USA.	02/2025
Oral presentation online at cryo-STAR Forum	07/2024
Oral presentation at 3DEM-GRS/GRC, Barcelona, Spain	06/2024
Oral presentation at the 5th International Symposium on Cryo-3D Image Analysis, Tahoe, USA.	03/2024
Oral presentation at the 3 rd Eastern China Structural Biology Conference, Suzhou, China	04/2018
Oral presentation at the 62 nd Annual Meeting of Biophysical Society, San Francisco, USA.	02/2018
Poster presentation at Protein Aggregation in Health & Disease of FASEB Symposium, Steamboat, USA.	06/2017

PROFESSIONAL SERVICE

Service to the Discipline

Journal Referee for *Proc. Natl. Acad. Sci.*, *Nature Commun.*, *Front. Mol. Neurosci.*.

Computational and Mathematical Methods in Medicine, Guest editor 2021-22

Frontiers in Neuroscience, Manuscript Reviewer	01/2019
66 th Annual Meeting of Biophysical Society, Poster Competition Judge	02/2022
Service to the University	
Stanford University Chinese Postdoctoral Association, Council Member	2020-2024
Stanford University Postdoctoral Association Leadership Retreat, Organizer	10/2022
Stanford University Postdoctoral Association, Council Member	2021-24
Stanford University Postdoctoral Association, one of two co-Chairs	2021-22
Stanford Chinese Postdoc Journal Club and Oral Presentation Improvement, Course Organizer	2020-22
Interdisciplinary Research Center on Biology and Chemistry Graduate Student Union, President	2014-15

PUBLICATIONS

*First and co-first author publications

1. **Wang, C.***, Jiang, W.*, Leitz, J.*, Yang, K., Esquivies, L., Wang, X., Shen, X., Held, R., Adams, D., Basta, T., Hampton, L., Jian, R., Jiang, L., Stowell, M., Baumeister, W., Guo, Q. & Brunger, A. T. Structure and Topography of the Synaptic V-ATPase–synaptophysin Complex. *Nature* 631, 899–904 (2024).
2. **Wang, C.**, Zhang, K., Cai B., Haller, J. E., Carnazza, K. E., Hu J., Zhao, C., Tian Z., Hu X., Hall D., Qiang J., Hou S., Liu Z., Gu J., Zhang Y., Seroogy K. B., Burré J., Fang, Y., Liu, C., Brunger A. T., Li D., Diao J. VAMP2 Chaperones α -Synuclein in Synaptic Vesicle co-Condensates. *Nat. Cell Biol.* 26, 1287–1295 (2024).
3. Shen, X.*, **Wang, C.***, Zhou, X., Zhou, W., Hornburg, D., Wu, S., and Snyder, M. Nonlinear Dynamics of Multi-omics Profiles during Human Aging. *Nat. Aging* (2024) doi:10.1038/s43587-024-00692-2.
4. Zhao, C.*, Tu, J.*, **Wang, C.***, Liu, W., Gu, J., Yin, Y., Zhang, S., Li, D., Diao, J., Zhu, Z., Liu, C. Lysophosphatidylcholine Binds α -Synuclein and Prevents Its Pathological Aggregation. *Natl. Sci. Rev.* 11, nwae182 (2024).
5. **Wang, C.***, Zhao, C. *, Hu, X., Qiang, J., Liu, Z., Gu, J., Zhang, S., Li, D., Zhang, Y., Burré, J., Diao, J. and Liu, C. N-acetylation of α -Synuclein Enhances Synaptic Vesicle Clustering Mediated by α -synuclein And Lysophosphatidylcholine. *eLife*, 13:RP97228 (2024) doi.org/10.7554/eLife.97228.3.
6. Lai, Y.*, Zhao, C.*, Tian, Z.*, **Wang, C.***, Fan, J.*, Hu, X., Tu, J., Li, T., Leitz, J., Pfuetzner, R., Liu, Z., Zhang, S., Su, Z., Burré, J., Li, D., Südhof, T., Zhu, Z., Liu, C., Brunger, A. T. and Diao, J. Neutral Lysophosphatidylcholine Mediates α -Synuclein-induced Synaptic Vesicle Clustering. *Proc. Natl. Acad. Sci.*, 120, e2310174120 (2023).
7. Shen, X.*, Shao, W.*, **Wang, C.***, Liang, L., Chen, S., Zhang, S., Rusu, M., Snyder, M. P. Deep Learning-based Pseudo-Mass Spectrometry Imaging Analysis for Precision Medicine. *Brief. Bioinform.* 23, bbac331 (2022).
8. Shen, X.*, Yan, H.*, **Wang, C.***, Gao, P., Johnson, C. H., & Snyder, M. P. (2022). TidyMass an Object-oriented Reproducible Analysis Framework for LC–MS Data. *Nat. Commun.* 13, 4365 (2022).
9. Shen, X.*, **Wang, C.***, & Snyder, M. P. massDatabase: Utilities for the Operation of the Public Compound and Pathway Database. *Bioinformatics* 38, 4650–4651 (2022).
10. Yang, K.*, **Wang, C.***, Kreutzberger, A. J.*, Ojha, R., Kuivanen, S., Couoh-Cardel, S., Muratcioglu S., Eisen T. J., White K. I., Held R. G., Subramanian S., Marcus K., Pfuetzner R., Esquivies L., Doyle C. A., Kuriyan J., Vapalahti O., Balistreri G., Kirchhausen T. & Brunger, A. T. Nanomolar Inhibition of SARS-CoV-2 Infection by An Unmodified Peptide Targeting the Prehairpin Intermediate of the Spike Protein. *Proc. Natl. Acad. Sci.* 119, e2210990119 (2022).
11. **Wang, C.**, Tu, J., Zhang, S., Cai, B., Liu, Z., Hou, S., Liu, Z., Diao, J., Zhu, Z.-J., Liu, C., Li, D., Different Regions of Synaptic Vesicle Membrane Regulate VAMP2 Conformation for the SNARE Assembly. *Nat. Commun.* 11, 1531 (2020).
12. Lu, J.*, Cao, Q.*, **Wang, C.***, Zheng, J., Luo, F., Xie, J., Li, Y., Ma, X., He, L., Eisenberg, D., Nowick, J., Jiang, L., Li, D., Structure-based Peptide Inhibitor Design of Amyloid Aggregation. *Front. Mol. Neurosci.* 12, (2019).

13. Zhang, S.*, **Wang, C.***, Lu, J., Ma, X., Liu, Z., Li, D., Liu, Z., Liu, C., In-Cell NMR Study of Tau and MARK2 Phosphorylated Tau. *Int. J. Mol. Sci.* 20, (2019).
14. **Wang, C.**, Zhao, C., Li, D., Tian, Z., Lai, Y., Diao, J., Liu, C., Versatile Structures of α -Synuclein. *Front. Mol. Neurosci.* 9, (2016).

Other collaborative publications

1. Brunger, A.T., Held, R.G., Khan, Y.A., Leitz, J., Liang, J., **Wang, C.** & White K. I.; Recent Structural Insights into the Molecular Architecture of Synapses. In: Kavalali, E. (eds) Nano-organization of the Synapse. Advances in Neurobiology, vol 48. Springer, Cham. DOI: 10.1007/978-3-032-12594-1_2
2. Held, R.G., Liang, J., Esquivies, L., Khan, Y.A., **Wang, C.**, Azubel, M., Brunger, A.T. In-Situ Structure and Topography of AMPA Receptor Scaffolding Complexes Visualized by CryoET. *bioRxiv*, (2024) doi: 10.1101/2024.10.19.619226.
3. Leitz, J., **Wang, C.**, Esquivies, L., Peters, J., Gopal, N., Pfuetzner, R., Wang, L., Brunger, A. T. Observing Isolated Synaptic Vesicle association and Fusion Ex vivo. *Nat. Protoc.* (2024).
4. Leitz, J., **Wang, C.**, Esquivies, L., Pfuetzner, R., Peters, J., Couoh-Cardel, S., Wang, L., Brunger, A. T. Beyond the MUN Domain, Munc13 Controls Priming and Depriming of Synaptic Vesicles. *Cell Rep.* 43, (2024).
5. Gopal, N., Leitz, J., **Wang, C.**, Esquivies, L., Pfuetzner, R., Brunger, A. T. A New Method for Isolation and Purification of Fusion-Competent Inhibitory Synaptic Vesicles. *Curr. Res. Physiol.* 7, 100121 (2024).
6. Shen, X., Kellogg, R., Panyard, D.J., Bararpour, N., Castillo, K., Lee-McMullen, B., Delfarah, A., Ubellacker, J., Ahadi, S., Rosenberg-Hasson, Y., Ganz, A., Contrepois, K., Michael, B., Simms, I., **Wang, C.**, Hornburg, D., Snyder, M. Multi-omics Microsampling for the Profiling of Lifestyle-Associated Changes in Health. *Nat. Biomed. Eng.* 8, 11–29 (2024).
7. Yang, K., **Wang, C.**, Kreutzberger, A. J., White, K. I., Pfuetzner, R. A., Esquivies, L., Kirchhausen T. & Brunger, A. T. Structure-based Design of a SARS-CoV-2 Omicron-Specific Inhibitor. *Proc. Natl. Acad. Sci.* 120, e2300360120 (2023).
8. Yang, K., **Wang, C.**, White, K. I., Pfuetzner, R. A., Esquivies, L., Brunger, A. T., Structural Conservation among Variants of the SARS-CoV-2 Spike Postfusion Bundle. *Proc. Natl. Acad. Sci.* 119, e2119467119 (2022).
9. Zhang, S., Liu, Y-Q., Jia, C., Lim, Y-J., Feng, G., Xu, E., Long, H., Kimura, Y., Tao, Y., Zhao, C., **Wang, C.**, Liu, Z., Hu, J-J., Ma, M-R., Liu, Z., Jiang, L., Li, D., Wang, R., Dawson, V. L., Dawson, T. M., Li, Y-M., Mao, X. Liu, C., Mechanistic Basis for Receptor-mediated Pathological α -Synuclein Fibril Cell-to-Cell Transmission in Parkinson's Disease. *Proc. Natl. Acad. Sci.* 118, e2011196118 (2021).
10. Liu, Z.*, Zhang, S.*, Gu, J.*, Li, Y., Gui, X., Long, H., **Wang, C.**, Zhao, C., Lu, J., Liu, Z., Liu, C., Li, D., Hsp27 Chaperones FUS Phase Separation Under the Modulation of Stress-induced Phosphorylation. *Nat. Struct. Mol. Biol.* 27, 363–372 (2020).
11. Ma, X., Zhu, Y., Lu, J., Xie, J., Li, C., Shin, W. S., Qiang, J., Liu, J., Dou, S., Xiao, Y., **Wang C.**, Jia C., Long H., Yang J., Fang Y., Jiang L., Zhang Y., Zhang S., Zhai R. G., Liu C., Li D.; Nicotinamide Mononucleotide Adenylyl transferase Uses its NAD⁺ Substrate-binding Site to Chaperone Phosphorylated Tau. *eLife*, 9, e51859 (2020).
12. Liu, Z., **Wang, C.**, Li, Y., Zhao, C., Li, T., Li, D., Zhang, S., Liu, C., Mechanistic Insights into the Switch of α B-Crystallin Chaperone Activity and Self-multimerization. *J. Biol. Chem.* 293, 14880–14890 (2018).
13. Du, Y., Huang, K., Zhang, J., **Wang, C.**, Chu, X., Hou, C., Feng, S., Photoluminescence Properties of La_{1/3}NbO₃: Sm³⁺ Coupled with Sr²⁺, Ba²⁺ and Bi³⁺ Under Near-UV Excitation. *Chem. J. Chin. Univ.* 34, 509 (2013).