# Zhiyu Zhao

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## Research Experience

**Postdoctoral Scholar** **08/2022 to present**
**Ron Dror's group, Stanford University**

- Applying molecular dynamics simulations to study biased signaling in G protein-coupled receptors and their interactions with kinases

**Ph.D. Research** **08/2015 to 07/2022**
**Emad Tajkhorshid's group, University of Illinois Urbana-Champaign**

- Used docking, molecular dynamics simulations, and free energy methods to study the dynamics and structural and functional impacts of ligand/ion binding to membrane transporters and channels
- Developed novel computational tools to perform cryo-EM-guided ligand docking and investigate long-range hydrogen-bonding connections

## Education

**Ph.D. in for Biophysics and Quantitative Biology** **08/2015 to 05/2022**
**University of Illinois Urbana-Champaign**
Advisor: Emad Tajkhorshid
Dissertation: Insights into Dynamics of Membrane Transporters from Computational Techniques

**B.S. in Physics, Shanghai Jiao Tong University** **09/2011 to 07/2015**

## Publications

### Research articles

- D. Yang, **Z. Zhao**, E. Tajkhorshid, and E. Gouaux. Structures and membrane interactions of native serotonin transporter in complexes with psychostimulants. ***Proceedings of the National Academy of Sciences***, 120(29), e2304602120, **2023**
- S. Dehghani-Ghahnaviyeh, **Z. Zhao**, and E. Tajkhorshid. Lipid-mediated prestin organization in outer hair cell membranes and its implications in sound amplification. ***Nature Communication***, 13, 6877, **2022**
- J. Ge, J. Elferich, S. Dehghani-Ghahnaviyeh, **Z. Zhao**, M. Meadows, H. v. Gersdorff, E. Tajkhorshid, and E. Gouaux. Molecular mechanism of prestin electromotive signal amplification. ***Cell***, 184, 4669–4679, **2021**
- P. Kumar, Y. Wang, Z. Zhang, **Z. Zhao**, G. D. Cymes, E. Tajkhorshid, and C. Grosman. Cryo-EM structures of a lipid-sensitive pentameric ligand-gated ion channel embedded in a phosphatidylcholine-only bilayer. ***Proceedings of the National Academy of Sciences***, 117: 1788–1798, **2020**

- J. Li, **Z. Zhao**, and E. Tajkhorshid. Locking two rigid-body bundles in an outward-facing conformation: The ion-coupling mechanism in a LeuT-fold transporter. ***Scientific Reports***, 9: 1–13, **2019**
- J. A. Coleman, D. Yang, **Z. Zhao**, P.-C. Wen, C. Yoshioka, E. Tajkhorshid, and E. Gouaux. Serotonin transporter-ibogaine complexes illuminate mechanisms of inhibition and transport. ***Nature***, 569: 141–145, **2019**
- M. L. Starr, R. P. Sparks, A. S. Arango, L. R. Hurst, **Z. Zhao**, M. Lihan, E. Tajkhorshid, and R. A. Fratti. Phosphatidic acid induces conformational changes in Sec18 protomers that prevent SNARE priming. ***Journal of Biological Chemistry***, 294: 3100–3116, **2019**

### Review articles

- T. Jiang, P.-C. Wen, N. Trebesch, **Z. Zhao**, S. Pant, K. Kapoor, M. Shekhar, and E. Tajkhorshid. Computational dissection of membrane transport at a microscopic level. ***Trends in Biochemical Sciences***, 45: 202–216, **2019**
- P.-C. Wen, P. Mahinthichaichan, N. Trebesch, T. Jiang, **Z. Zhao**, E. Shinn, Y. Wang, M. Shekhar, K. Kapoor, C. K. Chan, and E. Tajkhorshid. Microscopic view of lipids and their diverse biological functions. ***Current Opinion in Structural Biology***, 51: 177–186, **2018**
- J. V. Vermaas, N. Trebesch, C. G. Mayne, S. Thangapandian, M. Shekhar, P. Mahinthichaichan, J. L. Baylon, T. Jiang, Y. Wang, M. P. Muller, E. Shinn, **Z. Zhao**, P.-C. Wen, and E. Tajkhorshid. Microscopic characterization of membrane transport function by *in silico* modeling and simulation. ***Methods in Enzymology***, 578: 373–428, **2016**

## Presentation

- *GOLEM: automated and robust cryo-EM-guided ligand docking with explicit water molecules.* $65^{\text{th}}$ Biophysics Cociety Annually Meeting, 02/2021

## Honors and Awards

- Student Research Achievement Award $62^{\text{nd}}$ Biophysics Society Annually Meeting, 02/2018