Zhe (James) Chen

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Education

2002	Ph.D. in Molecular Biophysics, University of Texas Southwestern Medical Center
2000	M.S. in Computer Science, University of Texas at Dallas
1995	B.S. in Biological Sciences and Biotechnology, Tsinghua University, Beijing, China

Research Experience

2022 – present	Professor, Department of Biophysics, University of Texas Southwestern Medical Center
2018 – 2022	Associate Professor, Department of Biophysics, University of Texas Southwestern Medical Center
2012 – 2018	Assistant Professor, Department of Biophysics, University of Texas Southwestern Medical Center
2011 – 2012	Assistant Professor, Department of Biochemistry, University of Texas Southwestern Medical Center
2007 – 2011	Instructor, Department of Pharmacology, University of Texas Southwestern Medical Center
2002 – 2007	Postdoctoral Associate, Department of Biochemistry, University of Texas Southwestern Medical Center
1996 - 2002	Graduate Student, Department of Biochemistry, University of Texas Southwestern Medical Center

Professional and Technical Skills

- 11 years of experience working in a multi-disciplinary core facility, providing services including cryo-EM, X-ray crystallography, SAXS and microED to 40-50 investigators across 18 departments from academic institutions and industry
- Building out and managing the cryo-EM service at the core facility from ground up for over 6 years
- Excellent planning and communication skills
- Cryo-electron microscopy (sample preparation, microscope operation/management, screening and data collection on Talos Arctica/Glacios and Titan Krios, data processing with Relion/cryoSPARC, model refinement and analysis)
- Micro-crystal electron diffraction (sample preparation with small molecules and proteins, data collection, processing and refinement)
- Negative-stain transmission electron microscopy (sample preparation, microscope operation, screening and data collection on Tecnai Spirit)
- Macromolecular X-ray crystallography (protein crystallization, data collection and processing, MR and SAD/MAD phasing methods, model refinement and structural analysis)
- Small molecule X-ray crystallography (data collection and processing, direct phasing, model refinement and structural analysis)

- Small angle X-ray scattering (SAXS data collection and processing, *ab initio* low resolution model calculation, model fitting and optimization)
- Deep understanding of computer technology on both hardware and software levels, working closely with the Bioinformatics department/BioHPC to increase productivity and efficiency
- Mass Photometry, Isothermal titration calorimetry (ITC), microscale thermophoresis (MST), circular dichroism (CD) spectroscopy and fluorescence spectroscopy (FRET, BRET)
- Molecular cloning; design and constructing protein expression vectors for bacterial hosts and insect cells
- Protein expression and purification from bacterial hosts and insect cells

Teaching & Mentoring Experience

2021 – present	Organizing and teaching in workshops on single particle cryo-EM data processing with cryoSPARC.
2021 – present	Organizing and teaching on advanced topics in data processing on single particle cryo-EM
2018 – present	Organizing and teaching in workshops on single particle cryo-EM data processing with Relion.
2017 – present	Training and teaching on microscope operation, grid screening, data collection and analysis.
2017 – present	Training of over 200 users on cryo-EM sample preparation with Vitrobot.
2015 – 2018	Lectures in Practical X-ray Crystallography in the Molecular Biophysics graduate program.
2013 – present	Lectures in Modern Methods in Structural Biology in the Molecular Biophysics graduate program.
2002 – present	Student and staff mentoring and training.

Publications

1. Lampea, J.B., Desaia, P.P., Tripathia, A.K., Sabnisa, N.A., Chen, Z., Ranjana, A.P. and Vishwanatha, J.K. "Bone-Targeted Cabazitaxel Nanoparticles Inhibit the Epithelial-to-Mesenchymal" (manuscript submitted).
2. Singh, A.K., Kumar, R., Mukherjee, S., Kumar, J., Conlon, K.P., Basrur, V., Chen, Z., Han, X., and Venuprasad, K. "RORgt-Raftlin1 complex regulates the pathogenicity of Th17 cells and intestinal inflammation" (manuscript submitted).
3. Bernardes, N.E., Fung, H.Y.J., Li, Y., Chen, Z. and Chook, Y.M. (2022) "Structure of Importin-4 bound to the H3-H4•ASF1 histone·histone chaperone complex" *Proc. Natl. Acad. Sci.* https://doi.org/10.1073/pnas.2207177119.
4. Park, G.J., Osinski, A., Hernandez, G., Eitson, J., Majumdar, A., Tonelli, M., Henzler-Wildman, K., Pawlowski, K., Chen, Z., Li, Y., Schoggins., J and Tagliabracci, V.S. (2022) "The mechanism of RNA capping by SARS-CoV-2" *Nature*. https://doi.org/10.1038/s41586-022-05185-z.
5. Dewangan, P.S., Beraki, T., Paiz, E.A., Mensah, D.A., Chen, Z. and Reese, M.L. (2022) "Divergent kinase WNG1 is regulated by phosphorylation of an atypical activation sub-domain" *Biochemical Journal*. https://doi.org/10.1042/BCJ20220076.
6. Adduri, R.S.R, Vasireddy, R., Mroz, P., Karen V Alzate, K.V., Bhakta, A., Li, Y., Chen, Z., Miller J.W., Gopalakrishnan, V., Maier, L.A., Li, L. and Konduru, N.V. (2022) "Realistic biomarkers from plasma extracellular vesicles for detection of beryllium exposure" *International Archives of Occupational and Environmental Health*. https://doi.org/10.1007/s00420-022-01871-7
7. Osinski, A., Black, M.H., Pawlowski, K., Chen, Z., Li, Y. and Tagliabracci, V.S. (2021) "Structural and mechanistic basis for protein glutamylation by the kinase fold" *Mol. Cell* 81: 1-13.

8. Jiao, L., Shubbar, M., Yang, X., Zhang, Q, Chen, S., Wu, Q., Chen, Z., Rizo, J. and Liu, X. (2020) A Partially Disordered Region Connects Gene Repression and Activation Functions of EZH2" *Proc. Natl. Acad. Sci.*.117 (29): 16992-17002.
9. Peng, W., Fernandez, J., Casey, A.K., Servage, K.A., Chen, Z., Li, Y., Tomchick, D.R. and Orth, K. (2020) "A distinct inhibitory mechanism of the V-ATPase by Vibrio VopQrevealed by cryo-EM" *Nature Structural and Molecular Biology*, 27 (6):589-97.
10. Li, F., Raczynska, J.E., Chen, Z. and Yu, H. (2019) "Structural Insight into DNA-dependent Activation of Human Metalloprotease Spartan" Cell Reports (26):3336-46.
11. Maziarz, M., Leyme, A., Marivin, A., Luebbers, A., Patel, P.P., Chen, Z., Sprang, S.R. and Garcia-Marcos, M. (2018) "Atypical activation of the G protein $G\alpha_q$ by the oncogenic mutation Q209P" *J. Biol Chem* 293 (51): 19586-99
12. Majumdar, S., Kim, T., Chen, Z., Munyoki, S., Tso, S., Brautigam, C.A. and Rice L.M. (2018) "An isolated CLASP TOG domain suppresses microtubule catastrophe and promotes rescue" Mol. Biol. Cell (29): 1359-75.
13. Volkov, O.A., Brockway, A.J., Wring, S.A., Peel, M., Chen, Z., Phillips, M.A. and De Brabander, J.K. (2018) "Species-Selective Pyrimidineamine Inhibitors of *Trypanosoma brucei S*-Adenosylmethionine Decarboxylase" *J. Med. Chem. 61* (3), 1182–1203.
14. Chen, Z., Gutowski, S. and Sternweis, P. C. (2018) "Crystal Structures of the PH domains from Lbc Family of RhoGEFs Bound to Activated RhoA GTPase" *Data in Brief* 17: 356-362.
15. Dada, O., Gutowski, S., Brautigam, A.C., Chen, Z. and Sternweis, P. C. (2017) "Positive Feedback Regulation of p190RhoGEF Mediated by Activated Rho and Rac GTPases" *Journal of Structural Biology* 202(1).
16. Volkov, O.A., Kinch, L., Ariagno, C., Deng, X., Zhong, S., Grishin, N., Tomchick, D.R., Chen, Z. and Phillips, M.A. (2016) "Relief of autoinhibition by conformational switch explains enzyme activation by a catalytically dead paralog" *eLIFE* (2016);5:e20198.
17. Pascoe, H.G., Gutowski, S., Chen, H., Brautigam, C.A., Chen, Z., Sternweis, P.C. and Zhang, X. (2015) "Secondary PDZ domain-binding site on class B plexins enhances the affinity for PDZ-RhoGEF" *Proc. Natl. Acad. Sci.*.112 (48): 14852-57.
18. Hara, K., Zheng, G., Qu, Q., Liu, H., Ouyang, Z., Chen, Z., Tomchick, D. R. and Yu, H. (2014) "Structure of cohesin subcomplex pinpoints direct shugoshin-Wapl antagonism in centromeric cohesion" *Nat. Struct. Mol. Biol.* 21: 864-70.
19. Hunter, J., Gurbani, D., Ficarro, S.B., Carrasco, M., Lim, S.M., Choi, H.G., Xie, T., Marto, J.A., Chen, Z., Gray, N.S. and Westover, K.D. (2014) "In situ Selectivity Profiling and Crystal Structure of SML-8-73-1, an Active Site Inhibitor of Oncogenic K-Ras G12C" *Proc. Natl. Acad. Sci.* 111(24): 8895-8900.
20. Zhang, X., Wu, J., Du, F., Xu, H., Sun, L., Chen, Z., Brautigam, C. A., Zhang, X. and Chen, Z. J. (2014) "The Cytosolic DNA Sensor cGAS Forms An Oligomeric Complex with DNA and Undergoes Switch-like Conformational Changes in the Activation Loop" *Cell Report* 6(3): 421-30.
21. Zahm, J. A., Padrick, S. B., Chen, Z., Yunus, A. A., Henry, L., Tomchick, D. R., Chen, Z., and Rosen, M. K. (2013) "Structure of a Filament-Like Actin Trimer Bound to the Bacterial Effector VopL" *Cell* 155: 423-34.
22. Medina, F., Carter, A., Dada, O., Gutowski, S., Hadas, J., Chen, Z. and Sternweis, P. C. (2013) "Activated RhoA Is a Positive Feedback Regulator of the Lbc Family of Rho Guanine Nucleotide Exchange Factor Proteins" *J. Biol Chem* 288: 11325-33.
23. Chen, Z., Guo, L., Hadas, J., Sprang, S. R. and Sternweis, P. C. (2012) "Activation of the Guanine Nucleotide Exchange Activity of p115-RhoGEF Requires Direct Association of $G\alpha13$ and the Dbl-homology Domain" *J. Biol Chem* 287: 16369-77.
24. Chen, Z., Guo, L., Sprang, S. R. and Sternweis, P. C. (2011) "Modulation of a GEF Switch: Autoinhibition of the Intrinsic Guanine Nucleotide Exchange Activity of p115-RhoGEF." *Protein Science* 20: 107-117.
25. Chen, Z., Medina, F., Liu, M, Thomas, C., Sprang, S. R. and Sternweis, P. C. (2010) "The PH Domain of PDZRhoGEF Binds Activated RhoA." *J. Biol Chem* 285: 21070-81 (Cover and Paper of the Week).

26. Chen, Z., Singer, W. D., Danesh, S. M., Sternweis, P. C. and Sprang, S. R. (2008) “Recognition of the Activated States of Gα13 by the rgRGS Domain of PDZRhoGEF.” *Structure* 16(10): 1532-43.
27. Sprang, S. R., Chen, Z., and Du, X. (2007) “Structural basis of G protein – effector interactions.” *Advance in Protein Chemistry* **74**:1-65.
28. Sternweis, P. C., Chen, Z., Singer, W. D., et. al. (2007) “Regulation of RhoGEFs by G proteins.” *Advance in Protein Chemistry* **74**:189-228.
29. Chen, Z., Singer, W. D., Sternweis, P. C. and Sprang, S. R. (2005) “Structure of the p115RhoGEF rgRGS domain-Gα13/i1 chimera complex suggests convergent evolution of a GTPase activator.” *Nature Structural and Molecular Biology*, **12**:191-7.
30. Chen, Z., Singer, W. D., Wells, C. D., Sprang, S. R. and Sternweis, P. C. (2003). "Mapping the Gα13 Binding Interface of the rgRGS Domain of p115RhoGEF." *J Biol Chem* **278**(11): 9912-9.
31. Chen, Z., Wells, C. D., Sternweis, P. C., and Sprang, S. R. (2001). "Structure of the rgRGS domain of p115RhoGEF." *Nat Struct Biol* **8**(9): 805-9.
32. Nalefski, E. A., Wisner, M. A., Chen, J. Z., Sprang, S. R., Fukuda, M., Mikoshiba, K., and Falke, J. J. (2001). "C2 domains from different Ca^{2+} signaling pathways display functional and mechanistic diversity." *Biochemistry* **40**(10): 3089-100.
33. Melkonian, K. A., Ostermeyer, A. G., Chen, J. Z., Roth, M. G., and Brown, D. A. (1999). "Role of lipid modifications in targeting proteins to detergent-resistant membrane rafts. Many raft proteins are acylated, while few are prenylated." *J Biol Chem* **274**(6): 3910-7.