



Liang Feng

Associate Professor of Molecular and Cellular Physiology and, by courtesy, of Structural Biology

Bio

ACADEMIC APPOINTMENTS

- Associate Professor, Molecular and Cellular Physiology
- Associate Professor (By courtesy), Structural Biology
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- NIH Director's New Innovator Award, NIH (2015)
- Klingenstein-Simons Fellow, The Klingenstein Fund and the Simons Foundation (2015)
- Alfred P. Sloan Research Fellow, Alfred P. Sloan Foundation (2014)

PROFESSIONAL EDUCATION

- PhD, Princeton University (2006)
- MPhil, HKUST (2002)
- B.S., Tsinghua University (1999)

LINKS

- Lab stie (under construction): <https://sites.google.com/site/fenggroupatstanford/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Biological membranes act as selective barriers that separate the interior of cells from their outside environment. Membrane proteins play crucial roles in a wide range of biological and physiological processes and are targeted by a large number of pharmacologically active compounds including ~ 50% of the drugs in use today. Lack of high-resolution structural information has become a bottleneck for the mechanistic understanding of membrane proteins and hinders potential drug development. Our research interest lies primarily in understanding the mechanism and regulation of these dynamic membrane proteins, and developing small molecule modulators based on their structures and functions. We are taking a multi-disciplinary approach, employing structural methods to capture the high-resolution picture of different states, functional assays and biophysical methods to dissect the information inferred from the structure and computational approaches to understand their dynamics and kinetics.

Teaching

COURSES

2025-26

- How Cells Work: Energetics, Compartments, and Coupling in Cell Biology: MCP 156, MCP 256 (Spr)
- MCP Bootcamp: MCP 207 (Aut)

2024-25

- MCP Bootcamp: MCP 207 (Aut)

2023-24

- How Cells Work: Energetics, Compartments, and Coupling in Cell Biology: MCP 256 (Spr)
- MCP Bootcamp: MCP 207 (Aut)

2022-23

- MCP Bootcamp: MCP 207 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Teja Peddada, Jacob Schwartz, Joey Yoniles, Maiya Yu

Postdoctoral Faculty Sponsor

Xiaowei Huang, Bing Rao, Jianxiu Zhang

Doctoral Dissertation Advisor (AC)

Aswini Krishnan, Colin Muir, Kyle Trinh, Jim Zhang

Doctoral Dissertation Co-Advisor (AC)

Jiahao Liang

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biophysics (Phd Program)
- Molecular and Cellular Physiology (Phd Program)

Publications

PUBLICATIONS

- **Structure of mitochondrial pyruvate carrier and its inhibition mechanism** *NATURE*
He, Z., Zhang, J., Xu, Y., Fine, E. J., Suomivuori, C., Dror, R. O., Feng, L.
2025
- **Structure and thiazide inhibition mechanism of the human Na-Cl cotransporter.** *Nature*
Fan, M., Zhang, J., Lee, C. L., Zhang, J., Feng, L.
2023
- **Structure and mechanism of human cystine exporter cystinosin.** *Cell*
Guo, X., Schmiege, P., Assafa, T. E., Wang, R., Xu, Y., Donnelly, L., Fine, M., Ni, X., Jiang, J., Millhauser, G., Feng, L., Li, X.
2022
- **Structure and mechanism of the SGLT family of glucose transporters** *Nature*
Han, L., Qu, Q., Aydin, D., Panova, O., Robertson, M. J., Xu, Y., Dror, R. O., Skiniotis, G., Feng, L.

2022; 601: 274-279

- **Structure and mechanism of blood-brain-barrier lipid transporter MFSD2A.** *Nature*
Wood, C. A., Zhang, J., Aydin, D., Xu, Y., Andreone, B. J., Langen, U. H., Dror, R. O., Gu, C., Feng, L.
2021
- **Structure and mechanism of the mitochondrial Ca²⁺ uniporter holocomplex.** *Nature*
Fan, M., Zhang, J., Tsai, C. W., Orlando, B. J., Rodriguez, M., Xu, Y., Liao, M., Tsai, M. F., Feng, L.
2020; 582 (7810): 129-133
- **Structure and mechanism of the cation-chloride cotransporter NKCC1.** *Nature*
Chew, T. A., Orlando, B. J., Zhang, J., Latorraca, N. R., Wang, A., Hollingsworth, S. A., Chen, D., Dror, R. O., Liao, M., Feng, L.
2019
- **X-ray and cryo-EM structures of the mitochondrial calcium uniporter** *Nature*
Fan, C., Fan, M., Orlando, B., Fastman, N., Zhang, J., Xu, Y., Chambers, M., Xu, X., Perry, K., Liao, M., Feng, L.
2018
- **Mechanism of Substrate Translocation in an Alternating Access Transporter** *CELL*
Latorraca, N. R., Fastman, N. M., Venkatakrisnan, A. J., Frommer, W. B., Dror, R. O., Feng, L.
2017; 169 (1): 96-?
- **Structure of a eukaryotic SWEET transporter in a homotrimeric complex** *Nature*
Tao, Y., Cheung, L., Li, S., Eom, J., Chen, L., Xu, Y., Perry, K., Frommer, W., Feng, L.
2015
- **Structures of bacterial homologues of SWEET transporters in two distinct conformations** *NATURE*
Xu, Y., Tao, Y., Cheung, L. S., Fan, C., Chen, L., Xu, S., Perry, K., Frommer, W. B., Feng, L.
2014; 515 (7527): 448-?
- **Structure of a Eukaryotic CLC Transporter Defines an Intermediate State in the Transport Cycle** *SCIENCE*
Feng, L., Campbell, E. B., Hsiung, Y., MacKinnon, R.
2010; 330 (6004): 635-641
- **Structure and metal exchange in the cadmium carbonic anhydrase of marine diatoms** *NATURE*
Xu, Y., Feng, L., Jeffrey, P. D., Shi, Y., Morel, F. M.
2008; 452 (7183): 56-U3
- **Structure of a site-2 protease family intramembrane metalloprotease** *SCIENCE*
Feng, L., Yan, H., Wu, Z., Yan, N., Wang, Z., Jeffrey, P. D., Shi, Y.
2007; 318 (5856): 1608-1612
- **Structure of oxidized alpha-haemoglobin bound to AHSP reveals a protective mechanism for haem** *NATURE*
Feng, L., Zhou, S. P., Gu, L. C., Gell, D. A., MacKay, J. P., Weiss, M. J., Gow, A. J., Shi, Y. G.
2005; 435 (7042): 697-701
- **Molecular mechanism of AHSP-mediated stabilization of alpha-hemoglobin** *CELL*
Feng, L., Gell, D. A., Zhou, S. P., Gu, L. C., Kong, Y., Li, J. Q., Hu, M., Yan, N., Lee, C., Rich, A. M., Armstrong, R. S., Lay, P. A., Gow, et al
2004; 119 (5): 629-640
- **Structure and mechanism of the alkane-oxidizing enzyme AlkB.** *Nature communications*
Guo, X., Zhang, J., Han, L., Lee, J., Williams, S. C., Forsberg, A., Xu, Y., Austin, R. N., Feng, L.
2023; 14 (1): 2180
- **Structure and function of SemiSWEET and SWEET sugar transporters** *TRENDS IN BIOCHEMICAL SCIENCES*
Feng, L., Frommer, W. B.
2015; 40 (8): 480-486
- **Molecular mechanism of proton transport in CLC Cl⁻/H⁺ exchange transporters** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Feng, L., Campbell, E. B., MacKinnon, R.

2012; 109 (29): 11699-11704

- **A cis-Proline in alpha-Hemoglobin Stabilizing Protein Directs the Structural Reorganization of alpha-Hemoglobin** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Gell, D. A., Feng, L., Zhou, S., Jeffrey, P. D., Bendak, K., Gow, A., Weiss, M. J., Shi, Y., Mackay, J. P.
2009; 284 (43): 29462-29469
- **Enzymatic analysis of a rhomboid intramembrane protease implicates transmembrane helix 5 as the lateral substrate gate** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Baker, R. P., Young, K., Feng, L., Shi, Y., Urban, S.
2007; 104 (20): 8257-8262
- **Structural analysis of a rhomboid family intramembrane protease reveals a gating mechanism for substrate entry** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
Wu, Z., Yan, N., Feng, L., Oberstein, A., Yan, H., Baker, R. P., Gu, L., Jeffrey, P. D., Urban, S., Shi, Y.
2006; 13 (12): 1084-1091
- **Simple bioseparations using self-cleaving elastin-like polypeptide tags** *NATURE METHODS*
Banki, M. R., Feng, L. A., Wood, D. W.
2005; 2 (9): 659-661
- **A repetitive element containing a critical tyrosine residue is required for transcriptional activation by the EWS/ATF1 oncogene** *ONCOGENE*
Feng, L., Lee, K. A.
2001; 20 (31): 4161-4168