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EDUCATION AND TRAINING

2000 – 2006 Ph.D. in Biochemistry and Virology
Department of Cell Biology, Albert Einstein College of Medicine, NY, USA
Advisor: Dr. Margaret Kielian
Thesis title: *Studies on the mechanism of membrane fusion mediated by class II viral fusion proteins*

1995 – 1999 Bachelor (B.S.) in Biology
Department of Biology, Tsinghua University, Beijing, China.

PROFESSIONAL EXPERIENCE

2022 – present	Chair Professor. School of Life Sciences, SUSTech, China
2018 – 2022	Associate Professor. Department of Cell Biology, Harvard Medical School, USA
2014 – 2018	Assistant Professor. Department of Cell Biology, Harvard Medical School, USA
2008 – 2014	Postdoctoral fellow. University of California, San Francisco, USA Advisor: Dr. Yifan Cheng Topic: *Structural studies of protein complexes by single-particle electron microscopy*
2006 – 2008	Postdoctoral fellow. Albert Einstein College of Medicine, NY, USA Advisor: Dr. Margaret Kielian Topic: *Development of fusion inhibitors for class II viral fusion proteins*

CONTRIBUTIONS TO SCIENCE

In 2013 I solved the structure of TRPV1 ion channel, which is the first membrane protein structure solved by single-particle cryo-EM. Since 2014, my research group at Harvard Medical School has made important contributions to a number of research areas, including ATP-binding cassette (ABC) transporters (human ABCG2, and bacterial MsbA, $LptB_2FGC$, and LolCDE), DGAT1, Seipin, mitochondrial ATP synthase, calcium uniporter, ERAD, CRISPR-Cas, and RAG1-RAG2 complex. My scientific efforts have unique emphases on developing new methods to enable EM studies of molecular mechanisms and leveraging my rich experience in cryo-EM to accelerate drug development. In 2022 I relocated my laboratory to SUSTech in Shenzhen, China. My current research interest focuses on (1) innovative application and development of biological EM methods, (2) understanding the dynamics and mechanisms of membrane proteins at structural level, and (3) structure-driven revolution of drug discovery pipelines.

AWARDS AND HONORS

2019 Amgen Young Investigator Award
2019 Smith Family Foundation Odyssey Award
2019 Dorsett L. Spurgeon distinguished research award, Harvard Medical School
2019 Armenise-Harvard Foundation Junior Faculty Award
2017 Charles E.W. Grinnell fund award, Harvard Medical School
2017 John and Virginia Kaneb fellowship, Harvard Medical School
2016 William F. Milton award, Harvard Medical School
2016 Lynch endowed research fund award, Harvard Medical School
2016 Smith Family Award for Excellence in Biomedical Research

ACADEMIC SERVICE AND LEADERSHIP

2023 – present Director of SUSTech Institute for Biological Electron Microscopy (SIBEM)
2023 – present Director of SUSTech Cryo-EM Center
2022 – present Acting Chair of Department of Chemical Biology, School of Life Sciences, SUSTech
2022 – present Associate Editor of *Science Advances*
2019 – 2020 Ad hoc member, National Institute of Health (NIH) 2020/01 ZRG1 F04B-T (20) Biochemistry and Biophysics of Macromolecules Fellowship Review Committee
2019 – 2020 Ad hoc member, National Center for CryoEM Access and Training (NCCAT) User Review Committee
2018 – 2022 Co-organizer, New England Cryo-EM Symposium (twice a year)
2017 – 2022 Co-organizer, Harvard Medical School Cryo-EM Club Seminar Series
2017 Ad hoc member, HBI ALS Grant Review Committee, Harvard Brain Science Initiative
2016 – 2022 Member, Harvard Cryo-EM Executive Committee
2016 – 2022 Member, Harvard Biological and Biomedical Sciences Graduate Program Admission Committee
2016 – 2022 Member, Harvard Medical School Research Computing Faculty Advisory Committee
2016 Member, HMS BCMP Department Cryo-EM Junior Faculty Search Committee
2016 Ad hoc member, Transformative Science Program Grant Review Committee, US-Israel Binational Science Foundation
2014 – 2022 Faculty director, Harvard Medical School EM Facility

TEACHING

2023 Director and lecturer, Frontier in Life Science Seminar and Journal Club, SUSTech
2020 Director and lecturer, Biophysics 242r (Special Topics in Biophysics) on cryo-EM, HMS
2016 – 2022 Lecturer, Cell Biology 201 (Principles of Cell Biology) EM method lecture, HMS
2016 – 2022 Lecturer, Biophysics 300 cryo-EM lecture, HMS

INVITED TALKS

2023-06-20	Hong Kong, China	Invited seminar at IAS Symposium of Biological Cryo-EM, HKUST
2023-05-09	Shenzhen, China	Invited seminar at the 2nd SMART (深圳医学科学院) symposium
2023-03-23	Shenzhen, China	Invited seminar at the Institute of Infectious Diseases, Shenzhen Bay Laboratory
2023-02-18	Shenzhen, China	Invited seminar at the SUSTech-Tsinghua-Westlake Symposium of Life Science
2022-11-27	Dongguan, China	Invited seminar at 全国电子显微学学术年会
2022-09-22	Shenzhen, China	Invited seminar at 深圳三院肝病研究所学术沙龙
2022-08-27	Shenzhen, China	Invited seminar at 合成生物学大设施研讨会
2022-07-29	Online	Invited seminar at the 8th iConference on Electron Microscopy (iCEM)
2021-09-29	Online	Armenise-Harvard Foundation Career Development Awardees Monthly Talk
2021-07-27	Hangzhou, China	Westlake University School of Life Sciences Seminar
2021-07-20	Shenzhen, China	Invited Seminar at the Southern University of Science and Technology
2021-05-26	Online	Yale School of Medicine, Department of Cell Biology Seminar
2021-05-25	Online	Korean Society for Biochem and MolBio (KSBMB) International Conference 2021, Session of *Structure-based insights of the biophysics and molecular mechanism*
2021-04-28	Online	Invited seminar at the Protein Society Webinar on *Understanding Protein in Membrane Environments with Cryo-EM*
2021-03-24	Online	Princeton University, Department of Molecular Biology, MolBio Butler Seminar
2021-02-19	Online	University of South Florida, CMMB department Seminar
2021-01-10	Online	Invited seminar at the Global Scientist Interdisciplinary Online Forum, Southern University of Science and Technology
2020-12-01	Online	Hong Kong Univ of Science and Technology, Division of Life Science Seminar
2020-07-01	Online	Invited seminar at MOMA Therapeutics
2020-06-19	Online	Invited seminar at the 6th iConference on Electron Microscopy (iCEM)
2020-01-03	Hangzhou, China	Invited seminar at Westlake University
2019-10-03	Thousand Oaks, CA	17th Annual Young Investigator Award Seminar at Amgen, Inc.
2019-09-30	Denver, CO	University of Colorado, Biochemistry and Molecular Genetics Department Seminar
2019-07-04	Guangzhou, China	Invited seminar at Guangdong Academy of Medical Sciences (General Hospital)
2019-07-03	Guangzhou, China	Invited seminar at South China Agricultural University
2019-06-28	Gubei, Beijing, China	Invited seminar at the 6th National Cryo-EM and Structural Biology Symposium
2019-04-08	Orlando, FL	Invited seminar at Experimental Biology 2019 meeting, Session of *Cryo-EM and Re-revolution of Structural Biology*
2019-03-22	Tampa, FL	Invited seminar at University of South Florida, Morsani College of Medicine
2019-03-12	Boston, MA	Broad Institute, Channel Therapeutics (CHArT) seminar
2018-12-12	Baltimore, MD	University of Maryland Depts of Micro and Immuno (SOM) and Microbial Pathogenesis (SOD) seminar
2018-10-25	New Haven, CT	Yale University, MB&B department seminar
2018-10-06	Boston, MA	Invited seminar at Boston Biology and Biotechnology (BBB) Association
2018-07-22	Toronto, Canada	Invited seminar at American Crystallographic Association annual meeting Session of *Advances in Biological Cryo-Electron Microscopy*
2018-04-27	Los Angeles, CA	Invited seminar at the Symposium on *Frontiers and Careers in cryo-EM*, California NanoSystems Institute (CNSI) at UCLA
2018-04-19	New York, NY	Rockefeller University, Evnin Chemical Biology Seminar
2018-04-03	Wuxi, China	Invited seminar at Jiangnan University
2018-03-13	Ventura, CA	Invited seminar at GRC of *New Antibacterial Discovery and Development*

2018-02-07 Granlibakken Tahoe, CA Invited seminar at Keystone Symposium on *Cryo-EM from Cells to Molecules*
2017-06-25 New London, NH Invited seminar at GRC of *Mechanisms of Membrane Transport*
2017-02-15 Andover, MA Invited seminar at Eisai AiM Institute
2016-10-19 Baltimore, MD Invited seminar at Johns Hopkins University, Department of Physiology
2016-10-17 Boston, MA Invited seminar at Broad Institute
2016-06-07 Worcester, MA University of Massachusetts Medical School, Massachusetts Structure Biology Club
2015-07-21 Shanghai, China Invited seminar at the National Center for Protein Science
2015-07-20 Shanghai, China Invited seminar at Fudan University
2015-07-09 Beijing, China Invited seminar at the Institute of Biophysics, Chinese Academy of Sciences
2015-07-08 Beijing, China Tsinghua University, invited workshop and lecture on EM image processing
2015-04-14 Boston, MA Invited seminar at the CASSS annual meeting on *Higher Order Structure*
2015-03-24 Boston, MA Invited seminar at Boston University School of Medicine
2014-06-25 Girona, Spain Invited seminar at GRC on *3D Electron Microscopy*
2014-04-15 New York, NY Invited seminar at Albert Einstein College of Medicine, Department of Cell Biology
2014-03-26 Ventura, CA Invited seminar at GRC on *Ligand Recognition and Molecular Gating*
2014-03-17 Boston, MA Invited seminar at Harvard Medical School, Department of Cell Biology
2014-03-06 Philadelphia, PA Invited seminar at University of Pennsylvania, Dept of Biochem and Biophysics
2014-02-06 New York, NY Invited seminar at Columbia University, Dept of Biochemistry and Mol Biophysics
2014-02-04 Stony Brook, NY Invited seminar at Stony Brook University, Dept of Biochemistry and Cell Biology
2014-01-28 Seattle, WA Invited seminar at University of Washington, Department of Biochemistry
2014-01-16 Evanston, IL Invited seminar at Northwestern University, Department of Molecular Biosciences

PUBLICATIONS (@ = Corresponding author paper; # = Co-corresponding author; * = Co-first author)

Research Articles:

1. @ Wang K, Lee CW, Sui X, Kim S, Wang S, Higgs AB, Baublis AJ, Voth GA, **Liao M**[#], Walther TC[#], Farese RV Jr[#]. The structure of phosphatidylinositol remodeling MBOAT7 reveals its catalytic mechanism and enables inhibitor identification. ***Nat Commun.*** 2023 Jun 14;14(1):3533. doi: 10.1038/s41467-023-38932-5. PMID: 37316513; PMCID: PMC10267149.

2. @ Sui X, Wang K, Song K, Xu C, Song J, Lee CW, **Liao M**[#], Farese RV Jr[#], Walther TC[#]. Mechanism of action for small-molecule inhibitors of triacylglycerol synthesis. ***Nat Commun.*** 2023 May 29;14(1):3100. doi: 10.1038/s41467-023-38934-3. PMID: 37248213; PMCID: PMC10227072.

3. @ Plummer-Medeiros AM, Culbertson AT, Morales-Perez CL, **Liao M**. Activity and structural dynamics of human ABCA1 in a lipid membrane. ***J Mol Biol.*** 2023 Mar 7;435(8):168038. doi: 10.1016/j.jmb.2023.168038. Epub ahead of print. PMID: 36889459.

4. @ Thélot FA, **Liao M**. Cryo-EM analysis of the lipopolysaccharide flippase MsbA. ***Methods Mol Biol.*** 2022;2548:233-247. doi: 10.1007/978-1-0716-2581-1_14. PMID: 36151501.

5. Baez-Nieto D, Allen A, Akers-Campbell S, Yang L, Budnik N, Pupo A, Shin YC, Genovese G, **Liao M**, Pérez-Palma E, Heyne H, Lal D, Lipscombe D, Pan JQ. Analysing an allelic series of rare missense variants of CACNA1I in a Swedish schizophrenia cohort. ***Brain***. 2022 Jun 3;145(5):1839-1853. doi: 10.1093/brain/awab443.

PMID: 34919654; PMCID: PMC9166571.

6. @ Liu D*, Thélot FA*, Piccirilli JA, **Liao M**[#], Yin P[#]. Sub-3-Å cryo-EM structure of RNA enabled by engineered homomeric self-assembly. ***Nature Methods***. 2022 May;19(5):576-585. doi: 10.1038/s41592-022-01455-w. Epub 2022 May 2. PMID: 35501384.

7. Arlt H, Sui X, Folger B, Adams C, Chen X, Remme R, Hamprecht FA, DiMaio F, **Liao M**, Goodman JM, Farese RV Jr, Walther TC. Seipin forms a flexible cage at lipid droplet formation sites. ***Nat Struct Mol Biol.*** 2022 Feb 24. doi: 10.1038/s41594-021-00718-y. Epub ahead of print. PMID: 35210614.

8. @ Thélot FA, Zhang W, Song K, Xu C, Huang J, **Liao M**. Distinct allosteric mechanisms of first-generation MsbA inhibitors. ***Science***. 2021 Sep 23. doi: 10.1126/science.abi9009. Epub ahead of print. PMID: 34554829.

9. @ Sharma S*, Zhou R*, Wan L, Shan Feng, Song K, Xu C, Li Y[#], **Liao M**[#]. Mechanism of LolCDE as a molecular extruder of bacterial triacylated lipoproteins. ***Nat Commun*** 12, 4687 (2021). 2021 Aug 3;12(1):4687. doi: 10.1038/s41467-021-24965-1. PMID: 34344901; PMCID: PMC8333309.

10. @ Luo M*, Zhou W*, Patel H, Srivastava AP, Symersky J, Bonar MM, Faraldo-Gómez JD[#], **Liao M**[#], Mueller DM[#]. Bedaquiline inhibits the yeast and human mitochondrial ATP synthases. ***Commun Biol.*** 2020 Aug 19;3(1):452. doi: 10.1038/s42003-020-01173-z. PMID: 32814813; PMCID: PMC7438494.

11. Fan M*, Zhang J*, Tsai CW*, Orlando BJ, Rodriguez M, Xu Y, **Liao M**, Tsai MF[#], Feng L[#]. Structure and mechanism of the mitochondrial Ca^{2+} uniporter holocomplex. ***Nature.*** 2020 Jun;582(7810):129-133. doi: 10.1038/s41586-020-2309-6. Epub 2020 May 20. PMID: 32494073.

12. @ Sui X, Wang K, Gluchowski NL, **Liao M**[#], Walther TC[#], Farese RV Jr[#]. Structure and catalytic mechanism of a human triglyceride synthesis enzyme. ***Nature.*** 2020. doi: 10.1038/s41586-020-2289-6. Epub 2020 May 13. PMID: 32433611; PMCID: PMC7398557.

13. @ Orlando BJ, **Liao M**. ABCG2 transports anticancer drugs via a closed-to-open switch. ***Nature Communication*****.** 2020 May 8;11(1):2264. doi: 10.1038/s41467-020-16155-2. PMID: 32385283; PMCID: PMC7210939.

14. Wu X, Siggel M, Ovchinnikov S, Mi W, Svetlov V, Nudler E, **Liao M**, Hummer G, Rapoport TA. Structural basis of ER-associated protein degradation mediated by the Hrd1 ubiquitin ligase complex. ***Science.*** 2020 Apr 24;368(6489):eaaz2449. doi: 10.1126/science.aaz2449. PMID: 32327568; PMCID: PMC7380553.

15. @ Chew TA*, Orlando BJ*, Zhang J*, Latorraca NR, Wang A, Hollingsworth SA, Chen DH, Dror RO, **Liao M**[#], Feng L[#]. Structure and mechanism of the cation-chloride cotransporter NKCC1. ***Nature.*** 2019 Aug;572(7770):488-492. doi: 10.1038/s41586-019-1438-2. Epub 2019 Jul 31. PMID: 31367042; PMCID: PMC6856059.

16. @ Giessen TW[#], Orlando BJ, Verdegaal AA, Chambers MG, Gardener J, Bell DC, Birrane G, **Liao M**[#], Silver PA[#]. Large protein organelles form a new iron sequestration system with high storage capacity. ***Elife.*** 2019 Jul 8;8:e46070. doi: 10.7554/eLife.46070. PMID: 31282860; PMCID: PMC6668986.

17. @ Li Y*, Orlando BJ*, **Liao M**. Structural basis of lipopolysaccharide extraction by the $LptB_2FGC$ complex.

Nature. 2019 Mar;567(7749):486-490. doi: 10.1038/s41586-019-1025-6. Epub 2019 Mar 20. PMID: 30894744; PMCID: PMC6532066.

18. Shaik MM, Peng H, Lu J, Rits-Volloch S, Xu C, **Liao M**, Chen B. Structural basis of coreceptor recognition by HIV-1 envelope spike. ***Nature***. 2019 Jan;565(7739):318-323. doi: 10.1038/s41586-018-0804-9. Epub 2018 Dec 12. PMID: 30542158; PMCID: PMC6391877.

19. @ Sui X, Arlt H, Brock KP, Lai ZW, DiMaio F, Marks DS, **Liao M**[#], Farese RV Jr[#], Walther TC[#]. Cryo-electron microscopy structure of the lipid droplet-formation protein seipin. ***J Cell Biol.*** 2018 Dec 3;217(12):4080-4091. doi: 10.1083/jcb.201809067. Epub 2018 Oct 16. PMID: 30327422; PMCID: PMC6279392.

20. @ Ru H*, Mi W*, Zhang P, Alt FW, Schatz DG, **Liao M**[#], Wu H[#]. DNA melting initiates the RAG catalytic pathway. ***Nat Struct Mol Biol***. 2018 Aug;25(8):732-742. doi: 10.1038/s41594-018-0098-5. Epub 2018 Jul 30. PMID: 30061602; PMCID: PMC6080600.

21. @ Fan C*, Fan M*, Orlando BJ*, Fastman NM*, Zhang J, Xu Y, Chambers MG, Perry K, **Liao M**[#], and Feng L[#]. Structure of the mitochondrial calcium uniporter. ***Nature***. 2018 Jul;559(7715):575-579. doi: 10.1038/s41586-018-0330-9. Epub 2018 Jul 11. PMID: 29995856; PMCID: PMC6368340.

22. @ Xiao Y*, Luo M*, Dolan AE, **Liao M**[#], Ke A[#]. Structure Basis for RNA-guided DNA degradation by Cascade and Cas3. ***Science***. 2018 Jul 6;361(6397):eaat0839. doi: 10.1126/science.aat0839. Epub 2018 Jun 7. PMID: 29880725; PMCID: PMC6537108.

23. @ Srivastava AP*, Luo M*, Zhou W, Symersky J, Bai D, Chambers MG, Faraldo-Gómez JD, **Liao M**[#], Mueller DM[#]. High-resolution cryo-EM analysis of the yeast ATP synthase in a lipid membrane. ***Science***. 2018 May 11;360(6389):eaas9699. doi: 10.1126/science.aas9699. Epub 2018 Apr 12. PMID: 29650704; PMCID: PMC5948177.

24. Vigolo M, Chambers MG, Willen L, Chevalley D, Maskos K, Lammens A, Tardivel A, Das D, Kowalczyk-Quintas C, Schuepbach-Mallepell S, Smulski CR, Eslami M, Rolink A, Hummler E, Samy E, Fomekong Nanfack Y, Mackay F, **Liao M**, Hess H, Jiang X, Schneider P. A loop region of BAFF controls B cell survival and regulates recognition by different inhibitors. ***Nat Commun***. 2018 Mar 23;9(1):1199. doi: 10.1038/s41467-018-03323-8. PMID: 29572442; PMCID: PMC5865128.

25. Chen Y, Bensing BA, Seepersaud R, Mi W, **Liao M**, Jeffrey PD, Shajahan A, Sonon RN, Azadi P, Sullam PM, Rapoport TA. Unraveling the sequence of cytosolic reactions in the export of GspB adhesin from *Streptococcus gordonii*. ***J Biol Chem***. 2018 Apr 6;293(14):5360-5373. doi: 10.1074/jbc.RA117.000963. Epub 2018 Feb 9. PMID: 29462788; PMCID: PMC5892584.

26. @ Mi W, Li Y, Yoon SH, Ernst RK, Walz T, **Liao M**. Structural basis of MsbA-mediated lipopolysaccharide transport. ***Nature***. 2017 Sep 14;549(7671):233-237. doi: 10.1038/nature23649. Epub 2017 Sep 6. PMID: 28869968; PMCID: PMC5759761.

27. @ Schoebel S*, Mi W*, Stein A, Ovchinnikov S, Pavlovicz R, DiMaio F, Baker D, Chambers MG, Su H, Li D, Rapoport TA[#], **Liao M**[#]. Cryo-EM structure of the protein-conducting ERAD channel Hrd1 in complex with Hrd3. ***Nature***. 2017 Aug 17;548(7667):352-355. doi: 10.1038/nature23314. Epub 2017 Jul 6. PMID: 28682307; PMCID:

PMC5736104.

28. @ Xiao Y*, Luo M*, Hayes RP, Kim J, Ng S, Ding F, **Liao M**#, Ke A#. Structure Basis for Directional R-loop Formation and Substrate Handover Mechanisms in Type I CRISPR-Cas System. ***Cell***. 2017 Jun 29;170(1):48-60.e11. doi: 10.1016/j.cell.2017.06.012. PMID: 28666122; PMCID: PMC5841471.

29. Jin J, Liss NM, Chen DH, **Liao M**, Fox JM, Shimak RM, Fong RH, Chafets D, Bakkour S, Keating S, Fomin ME, Muench MO, Sherman MB, Doranz BJ, Diamond MS, Simmons G. Neutralizing Monoclonal Antibodies Block Chikungunya Virus Entry and Release by Targeting an Epitope Critical to Viral Pathogenesis. ***Cell reports***. 2015 Dec 22;13(11):2553-2564. doi: 10.1016/j.celrep.2015.11.043. Epub 2015 Dec 10. PMID: 26686638; PMCID: PMC4720387.

30. @ Ru H, Chambers MG, Fu TM, Tong AB, **Liao M**#, Wu H#. Molecular Mechanism of V(D)J Recombination from Synaptic RAG1-RAG2 Complex Structures. ***Cell***. 2015 Nov 19;163(5):1138-1152. doi: 10.1016/j.cell.2015.10.055. Epub 2015 Nov 5. PMID: 26548953; PMCID: PMC4690471.

31. Bhabha G, Cheng HC, Zhang N, Moeller A, **Liao M**, Speir JA, Cheng Y, Vale RD. Allosteric communication in the dynein motor domain. ***Cell***. 2014 Nov 6;159(4):857-68. doi: 10.1016/j.cell.2014.10.018. PMID: 25417161; PMCID: PMC4269335.

32. Cao E*, **Liao M***, Cheng Y, Julius D. TRPV1 structures in distinct conformations reveal activation mechanisms. ***Nature***. 2013 Dec 5;504(7478):113-8. doi: 10.1038/nature12823. PMID: 24305161; PMCID: PMC4023639.

33. **Liao M***, Cao E*, Julius D, Cheng Y. Structure of the TRPV1 ion channel determined by electron cryo-microscopy. ***Nature***. 2013 Dec 5;504(7478):107-12. doi: 10.1038/nature12822. PMID: 24305160; PMCID: PMC4078027.

34. Canzio D, **Liao M**, Naber N, Pate E, Larson A, Wu S, Marina DB, Garcia JF, Madhani HD, Cooke R, Schuck P, Cheng Y, Narlikar GJ. A conformational switch in HP1 releases auto-inhibition to drive heterochromatin assembly. ***Nature***. 2013 Apr 18;496(7445):377-81. doi: 10.1038/nature12032. Epub 2013 Mar 13. PMID: 23485968; PMCID: PMC3907283.

35. Schneidman-Duhovny D, Rossi A, Avila-Sakar A, Kim SJ, Velázquez-Muriel J, Strop P, Liang H, Krukenberg KA, **Liao M**, Kim HM, Sobhanifar S, Dötsch V, Rajpal A, Pons J, Agard DA, Cheng Y, Sali A. A method for integrative structure determination of protein-protein complexes. ***Bioinformatics***. 2012 Dec 15;28(24):3282-9. doi: 10.1093/bioinformatics/bts628. Epub 2012 Oct 23. PMID: 23093611; PMCID: PMC3519461.

36. Wu S, Avila-Sakar A, Kim J, Booth DS, Greenberg CH, Rossi A, **Liao M**, Li X, Alian A, Griner SL, Juge N, Yu Y, Mergel CM, Chaparro-Riggers J, Strop P, Tampé R, Edwards RH, Stroud RM, Craik CS, Cheng Y. Fabs enable single particle cryoEM studies of small proteins. ***Structure***. 2012 Apr 4;20(4):582-92. doi: 10.1016/j.str.2012.02.017. Epub 2012 Apr 3. PMID: 22483106; PMCID: PMC3322386.

37. **Liao M**, Sánchez-San Martín C, Zheng A, Kielian M. In vitro reconstitution reveals key intermediate states of trimer formation by the dengue virus membrane fusion protein. ***Journal of virology***. 2010 Jun;84(11):5730-40. doi: 10.1128/JVI.00170-10. Epub 2010 Mar 24. PMID: 20335260; PMCID: PMC2876590.

38. Lenassi M, Cagney G, **Liao M**, Vaupotic T, Bartholomeeusen K, Cheng Y, Krogan NJ, Plemenitas A, Peterlin BM. HIV Nef is secreted in exosomes and triggers apoptosis in bystander CD4+ T cells. ***Traffic***. 2010 Jan;11(1):110-22. doi: 10.1111/j.1600-0854.2009.01006.x. PMID: 19912576; PMCID: PMC2796297.

39. Umashankar M, Sánchez-San Martín C, **Liao M**, Reilly B, Guo A, Taylor G, Kielian M. Differential cholesterol binding by class II fusion proteins determines membrane fusion properties. ***Journal of virology***. 2008 Sep;82(18):9245-53. doi: 10.1128/JVI.00975-08. Epub 2008 Jul 16. PMID: 18632857; PMCID: PMC2546879.

40. **Liao M**, Kielian M. Functions of the stem region of the Semliki Forest virus fusion protein during virus fusion and assembly. ***Journal of virology***. 2006 Nov;80(22):11362-9. doi: 10.1128/JVI.01679-06. Epub 2006 Sep 13. PMID: 16971447; PMCID: PMC1642169.

41. **Liao M**, Kielian M. Site-directed antibodies against the stem region reveal low pH-induced conformational changes of the Semliki Forest virus fusion protein. ***Journal of virology***. 2006 Oct;80(19):9599-607. doi: 10.1128/JVI.01054-06. PMID: 16973563; PMCID: PMC1617250.

42. **Liao M**, Kielian M. Domain III from class II fusion proteins functions as a dominant-negative inhibitor of virus membrane fusion. ***The Journal of cell biology***. 2005 Oct 10;171(1):111-20. doi: 10.1083/jcb.200507075. PMID: 16216925; PMCID: PMC2171229.

43. **Liao M**, Kielian M. The conserved glycine residues in the transmembrane domain of the Semliki Forest virus fusion protein are not required for assembly and fusion. ***Virology***. 2005 Feb 5;332(1):430-7. doi: 10.1016/j.virol.2004.11.035. PMID: 15661173.

44. Gibbons DL, Ahn A, **Liao M**, Hammar L, Cheng RH, Kielian M. Multistep regulation of membrane insertion of the fusion peptide of Semliki Forest virus. ***Journal of virology***. 2004 Apr;78(7):3312-8. doi: 10.1128/jvi.78.7.3312-3318.2004. PMID: 15016852; PMCID: PMC371068.

45. **Liao M**, Lu Y, Xiao Y, Dierich MP, Chen Y. Induction of high level of specific antibody response to the neutralizing epitope ELDKWA on HIV-1 gp41 by peptide-vaccine. ***Peptides***. 2000 Apr;21(4):463-8. doi: 10.1016/s0196-9781(00)00179-0. PMID: 10822100.

46. Xiao Y, **Liao M**, Lu Y, Dierich MP, Chen YH. Epitope-vaccines: a new strategy to induce high levels of neutralizing antibodies against HIV-1. ***Immunobiology***. 2000 Jan;201(3-4):323-31. doi: 10.1016/S0171-2985(00)80087-X. PMID: 10776789.

Review Articles:

1. @ Plummer AM*, Culbertson AT*, **Liao M**. The ABCs of Sterol Transport. ***Annu Rev Physiol.*** 2020 Nov 3. doi: 10.1146/annurev-physiol-031620-094944. Epub ahead of print. PMID: 33141631.

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