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Education

Ph.D., Biochemistry, Baylor College of Medicine	2022/3
Dissertation Title: A Multi-Omics Atlas of the Human Retina at Single-Cell Resolution.	
Advisor: Dr. Rui Chen	
M.Sc., Biophysics, Fudan University	2016/6
Dissertation Title: Study on the interaction between Piperlongumine and its target proteins Glutathione S-Transferase Pi 1 (GSTP1) and Carbonyl Reductase 1 (CBR1).	
Advisor: Dr. Yu Ding	
B.Sc., Biological Sciences, Fudan University	2013/6

Professional Experiences

Assistant Professor , University of Oklahoma Health Campus	2026/4-
Postdoctoral Associate , UT MD Anderson Cancer Center	2022/5-2026/4
Advisor: Dr. Ken Chen	
Graduate Research Assistant (doctorate) , Baylor College of Medicine	2016/8-2022/3
Advisor: Dr. Rui Chen	
Research Assistant (Undergrad/Master student) , Fudan University	2012/3-2016/6
Advisor: Dr. Yu Ding	

Representative Publications (*= first author)

1. **Liang, Q.***, Soto, L.S., Haymaker, C., and Chen, K. (2025). LSGI: interpretable spatial gradient analysis for spatial transcriptomics data. *Genome Biology* 26, 238.
2. **Liang, Q.***, Huang, Y., He, S., and Chen, K. (2023). Pathway centric analysis for single-cell RNA-seq and spatial transcriptomics data with GSDensity. *Nature Communications* 2023 14:1 14, 1–17. 10.1038/s41467-023-44206-x.
3. **Liang, Q.***, Cheng, X.*, Wang, J.*, Owen, L., Shakoar, A., Lillvis, J.L., Zhang, C., Farkas, M., Kim, I.K., Li, Y., et al. (2023). A multi-omics atlas of the human retina at single-cell resolution. *Cell Genomics* 3, 100298. 10.1016/J.XGEN.2023.100298.
4. **Liang, Q.***, Wu, N.*, Zaneveld, S., Liu, H., Fu, S., Wang, K., Bertrand, R., Wang, J., Li, Y., and Chen, R. (2021). Transcript isoforms of Reep6 have distinct functions in the retina. *Hum Mol Genet* 30, 1907–1918. 10.1093/HMG/DDAB157.
5. **Liang, Q.***, Dharmat, R.*, Owen, L., Shakoar, A., Li, Y., Kim, S., Vitale, A., Kim, I., Morgan, D., Liang, S., et al. (2019). Single-nuclei RNA-seq on human retinal tissue provides improved transcriptome profiling. *Nature Communications* 2019 10:1 10, 1–12. 10.1038/s41467-019-12917-9.
6. Liu, R.*, **Liang, Q.***, Du, S.Q., Hu, X.J., and Ding, Y. (2016). The crystal structure of red fluorescent protein TagRFP-T reveals the mechanism of its superior photostability. *Biochem Biophys Res Commun* 477, 229–234. 10.1016/J.BBRC.2016.06.047.
7. **Liang, Q.***, Liu, R., Du, S., and Ding, Y. (2015). Structural insights on the catalytic site protection of human carbonyl reductase 1 by glutathione. *J Struct Biol* 192, 138–144.

8. Cui, X.*, **Liang, Q.***, Liang, Y.*, Lu, M.*, Ding, Y., and Lu, B. (2014). TR-FRET Assays of Huntingtin Protein Fragments Reveal Temperature and PolyQ Length-Dependent Conformational Changes. *Scientific Reports* 2014 4:1 4, 1–8. 10.1038/srep05601.

Other Publications

1. Rafei, H., Basar, R., Acharya, S., Hsu, Y.S., Liu, P., Zhang, D., Bohn, T., **Liang, Q.**, Mohanty, V., Upadhyay, R. and Li, P., 2025. CREM is a regulatory checkpoint of CAR and IL-15 signaling in NK cells. *Nature*, pp.1-11.
2. Jiang, X., Rudqvist, N.P., Jiang, B., Ye, S., He, S., **Liang, Q.**, Dou, J., Williams, M.D., Dunn, J.D., Johnson, J.M. and Akagi, K., 2025. Depletion of effector regulatory T cells associates with major response to induction dual immune checkpoint blockade. *Cancer Discovery*.
3. Guo, S., Liu, X., Cheng, X., Jiang, Y., Ji, S., **Liang, Q.**, Koval, A., Li, Y., Owen, L.A., Kim, I.K. and Aparicio, A., 2025. A deconvolution framework that uses single-cell sequencing plus a small benchmark data set for accurate analysis of cell type ratios in complex tissue samples. *Genome research*, 35(1), pp.147-161.
4. Lyu, Y., Kim, S.J., Humphrey, E.S., Nayak, R., Guan, Y., **Liang, Q.**, Kim, K.H., Tan, Y., Dou, J., Sun, H., Song, X., et al., Stem cell activity-coupled suppression of endogenous retrovirus governs adult tissue regeneration. *Cell*. 2024 Oct 29.
5. He, S., Gubin, M.M., Rafei, H., Basar, R., Dede, M., Jiang, X., **Liang, Q.**, Tan, Y., Kim, K., Gillison, M.L., Rezvani, K., et al., Elucidating immune-related gene transcriptional programs via factorization of large-scale RNA-profiles. *iScience*. 2024 Jun 21;27(6):110096.
6. Hamel, A.R., Yan, W., Rouhana, J.M., Monovarfeshani, A., Jiang, X., Mehta, P.A., Advani, J., Luo, Y., **Liang, Q.**, Rajasundaram, S., et al. (2024). Integrating genetic regulation and single-cell expression with GWAS prioritizes causal genes and cell types for glaucoma. *Nature Communications* 2024 15:1 15, 1–25. 10.1038/s41467-023-44380-y.
7. Wang, J., Cheng, X., **Liang, Q.**, Owen, L.A., Lu, J., Zheng, Y., Wang, M., Chen, S., DeAngelis, M.M., Li, Y., et al. (2023). Single-cell multiomics of the human retina reveals hierarchical transcription factor collaboration in mediating cell type-specific effects of genetic variants on gene regulation. *Genome Biol* 24, 1–32. 10.1186/S13059-023-03111-8/FIGURES/9.
8. Choi, J., Li, J., Ferdous, S., **Liang, Q.**, Moffitt, J.R., and Chen, R. (2023). Spatial organization of the mouse retina at single cell resolution by MERFISH. *Nature Communications* 2023 14:1 14, 1–17. 10.1038/s41467-023-40674-3.
9. Casanova, M.I., Chen, R., Garzel, L.M., Olstad, K.J., Kim, S., Harris, R.A., Li, Y., Raveendran, M., **Liang, Q.**, Wang, J., et al. (2022). Clinical presentation, treatment, and genetic and histopathological analysis of juvenile cataracts and secondary glaucoma in a rhesus macaque (*Macaca mulatta*). *J Med Primatol* 51, 119–123. 10.1111/JMP.12560.
10. Dou, J., Liang, S., Mohanty, V., Miao, Q., Huang, Y., **Liang, Q.**, Cheng, X., Kim, S., Choi, J., Li, Y., et al. (2022). Bi-order multimodal integration of single-cell data. *Genome Biol* 23, 1–25. 10.1186/S13059-022-02679-X/FIGURES/5.
11. Zou, G., Qi, R., Ma, M., Fu, S., **Liang, Q.**, Bi, X., Wang, C., Hu, X., Cai, Y., and Sheng, X. (2022). A novel stop codon mutation of TSPAN12 gene in Chinese patients with familial exudative vitreoretinopathy. *Ophthalmic Genet* 43, 210–217. 10.1080/13816810.2021.1998555.
12. Liang, S., **Liang, Q.**, Chen, R., and Chen, K. (2021). Stratified Test Accurately Identifies Differentially Expressed Genes under Batch Effects in Single-Cell Data. *IEEE/ACM Trans Comput Biol Bioinform* 18, 2072–2079. 10.1109/TCBB.2021.3094650.
13. Devlin, D.J., Agrawal Zaneveld, S., Nozawa, K., Han, X., Moye, A.R., **Liang, Q.**, Harnish, J.M., Matzuk, M.M., and Chen, R. (2020). Knockout of mouse receptor accessory protein 6 leads to sperm function and morphology defects. *Biol Reprod* 102, 1234–1247. 10.1093/BIOLRE/IOAA024.

14. Bertrand, R.E., Wang, J., Xiong, K.H., Thangavel, C., Qian, X., Ba-Abbad, R., **Liang, Q.**, Simões, R.T., Sampaio, S.A.M., Carss, K.J., et al. (2020). Ceramide synthase TLCD3B is a novel gene associated with human recessive retinal dystrophy. *Genetics in Medicine* 2020 23:3 23, 488–497. 10.1038/s41436-020-01003-x.
15. Zaneveld, S.A., Eblimit, A., **Liang, Q.**, Bertrand, R., Wu, N., Liu, H., Nguyen, Q., Zaneveld, J., Wang, K., Li, Y., et al. (2019). Gene Therapy Rescues Retinal Degeneration in Receptor Expression-Enhancing Protein 6 Mutant Mice. <https://home.liebertpub.com/hum> 30, 302–315. 10.1089/HUM.2018.078.
16. Moshiri, A., Chen, R., Kim, S., Harris, R.A., Li, Y., Raveendran, M., Davis, S., **Liang, Q.**, Pomerantz, O., Wang, J., et al. (2019). A nonhuman primate model of inherited retinal disease. *J Clin Invest* 129, 863–874. 10.1172/JCI123980.
17. Zhao, J., Xu, L., **Liang, Q.**, Sun, Q., Chen, C., Zhang, Y., Ding, Y., and Zhou, P. (2017). Metal chelator EGCG attenuates Fe(III)-induced conformational transition of α -synuclein and protects AS-PC12 cells against Fe(III)-induced death. *J Neurochem* 143, 136–146. 10.1111/JNC.14142.
18. Zhao, J., **Liang, Q.**, Sun, Q., Chen, C., Xu, L., Ding, Y., and Zhou, P. (2017). (–)-Epigallocatechin-3-gallate (EGCG) inhibits fibrillation, disaggregates amyloid fibrils of α -synuclein, and protects PC12 cells against α -synuclein-induced toxicity. *RSC Adv* 7, 32508–32517. 10.1039/C7RA03752J.
19. Yang, T., Zhang, H.L., **Liang, Q.**, Shi, Y., Mei, Y.A., Barrett, P.Q., and Hu, C. (2016). Small-conductance Ca^{2+} -activated potassium channels negatively regulate aldosterone secretion in human adrenocortical cells. *Hypertension* 68, 785–795. 10.1161/HYPERTENSIONAHA.116.07094.

Academic Activities

I served as a formal (*ad hoc*) manuscript reviewer for these journals:

Nature, Nature Methods, Genome Biology, Genome Medicine, GigaScience, Frontiers in Genetics, Frontiers in Bioengineering and Biotechnology, Aging

Invited talks:

1. *S-FLARE: Accurate and Scalable Inference of Unmeasured Features in Spatial Proteomics Data Using scRNA-seq References*
Cancer Target Discovery and Development (CTD2) Network Annual Meeting, NCI, March 2026
2. *Accurate and Scalable Inference of Unmeasured Features in Spatial Proteomics Data Using scRNA-seq References*
The Data Science Forum, UT MD Anderson Cancer Center, March 2026
3. *Interpretable Spatial Gradient Analysis for Tumor Spatial Transcriptomics Data*
Chan Zuckeberg Initiative (CZI) Monthly Cell Science Webinar, Oct 2024
4. *Pathway-centric and Gradient Analysis of Spatial Transcriptomics Data*
Emerging Scholars in Genome Sciences Symposium, University of Virginia, Sept 2024
5. *Interpretable Spatial Gradient Analysis for Tumor Spatial Transcriptomics Data*
Translational Molecular Pathology Science Day, UT MD Anderson Cancer Center
6. *Interpretable Spatial Gradient Analysis for Tumor Spatial Transcriptomics Data*
Texas Single Cell Seminar Research Talks, Texas Medical Center, Nov 2023
7. *Robust Pathway Analysis for scRNA-seq and Spatial Transcriptomics Data*
Texas Single Cell Seminar Research Talks, Texas Medical Center, Dec 2022
8. *Robust Pathway Analysis for scRNA-seq and Spatial Transcriptomics Data*
3rd Annual GCC Single Cell Omics Symposium, Texas Medical Center, Oct 2022 (one of the three invited talks for trainees)

9. *Single-cell Multi-omics Atlas of the Human Retina*
CZI eye network quarterly meeting, Online Seminar, Mar 2021
10. *Single-cell Multi-omics Atlas of the Human Retina*
Texas Single Cell Seminar Research Talks, Texas Medical Center, Mar 2021
11. *Single-cell Transcriptomics Atlas of the Human Retina*
Vision Club Seminar Series, Baylor College of Medicine, Aug. 2019

Poster Presentations:

1. *Inference of Unmeasured Features in Spatial Proteomics Data Using scRNA-seq References*
6th Annual GCC Single Cell Omics Symposium, Texas Medical Center, Oct 2025
2. *Delineating Microenvironmental Influence of Cellular Phenotypes Using Spatial Genomics*
ASHG 2024 Annual Conference, Nov 2024
3. *Robust Pathway Analysis for scRNA-seq and Spatial Transcriptomics Data*
The Biology of Genomes Conference (CSH) 2023, May 2023
4. *Single-cell Multi-omics Atlas of the Human Retina*
ARVO 2021 Annual Conference, May 2021 (Travel Grant awardee; Finalist for Outstanding Poster Award).
5. *Single-cell Multi-omics Atlas of the Human Retina*
ASHG 2019 Annual Meeting, Oct. 2019
6. *Structural insights on the catalytic site protection of human carbonyl reductase 1 by glutathione*
The 14th Chinese Biophysics Congress, Nov. 2015, Kunming, China

Awards and Grants

1. Emerging Scholar in Genome Sciences, University of Virginia, 2024.
2. Travel Grant for The Association for Research in Vision and Ophthalmology (ARVO) 2021 annual meeting.
3. The National Scholarship: for 2013-2014 academic year, Fudan University
4. The National Scholarship: for 2014-2015 academic year, Fudan University

Teaching and Mentorship

1. Teaching assistant for *Experiments in Physiology* (2014/3- 2014/6, undergraduate level)
2. Teaching assistant for *Computational Structural Biology* (2014/3-2014/6, undergraduate level)
3. Teaching assistant for *Modern Methods in Biomedical Research* (2013/8-2014/1, graduate level)
4. Bench mentor for 18 junior lab members in three different labs since 2014