Haikuo Li

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EDUCATION

PhD Student, Program in Molecular Genetics and Genomics 8/2019 – present
Washington University in St. Louis, MO, United States

- Thesis mentor: Benjamin D. Humphreys, M.D., Ph.D.
- Thesis committee: Ting Wang, Samantha Morris, Jeffrey Millman, Allegra Petti, Michael Meers

Bachelor of Science, Bioscience (Zhiyuan Honors Program) 9/2015 – 6/2019
Shanghai Jiao Tong University, Shanghai, China

- 2019 Top 0.2% Bachelor Thesis: Rank #1 in Bioscience
- 2019 Outstanding Graduate in Bachelor Degree, Shanghai

Visiting Student, Immunobiology 6/2018 – 4/2019
Yale University, New Haven, CT, United States

- Research supervisor: Aaron M. Ring, M.D., Ph.D.

PUBLICATIONS

1. **Li, H.**, Dixon, E. E., Wu, H., & Humphreys, B. D. (2022). Comprehensive single-cell transcriptional profiling defines shared and unique epithelial injury responses during kidney fibrosis. **Cell Metabolism**, 34(12), 1977–1998.e9. (**PDF**)
   - Research Highlights by *Nature Review Nephrology* (**URL**)
   - Research Highlights by *Kidney International* (**URL**)
2. **Li, H.**, & Humphreys, B. D. (2022). Mouse kidney nuclear isolation and library preparation for single-cell combinatorial indexing RNA sequencing. **STAR Protocols**, 3(4), 101904. (**PDF**)
3. **Li, H.**, & Humphreys, B. D. (2022). New functions for basophils identified in kidney fibrosis. **Nature Immunology**, 23(6), 824-825. (**PDF**)
4. Muto, Y*., **Li, H.*** (co-first author), & Humphreys, B. D. (2022). Single Cell Transcriptomics. **Innovations in Nephrology** (pp. 87-102). Springer, Cham. (**PDF**)
5. **Li, H.**, & Humphreys, B. D. (2021). Single cell technologies: Beyond microfluidics. **Kidney360**, 2(7), 1196. (**PDF**)
6. **Li, H.**, & Humphreys, B. D. (2020). Surveying the human single-cell landscape. **Kidney International**, 98(6), 1385-1387. (**PDF**)
7. Ku, X.*., Wang, J.*, **Li, H.*** (co-first author), Meng, C., Yu, F., Yu, W., Li, Z., Zhou, Z., Zhang, C., Hua, Y., Yan, W.#, Jin, J.# (2022). Proteomic Portrait of Human Lymphoma Reveals Protein Molecular Fingerprint of Disease Specific Subtypes and Progression. **Phenomics**, 1-19. (**PDF**)

8. (Unpublished ongoing research: Multimodal profiling of human kidneys with SHARE-seq and spatial metabolomics)

RESEARCH EXPERIENCE

PhD Student, Benjamin Humphreys Lab 4/2020 – present

Division of Nephrology, Washington University in St. Louis

- Developing a single-cell atlas of kidney fibrosis with single-cell multimodal profiling
- Studying metabolic mechanisms that drive kidney fibrosis
- Studying cell fate determination in kidney injury & regeneration and regional differentiation
- Method development: single-cell combinatorial indexing (split-pool barcoding) library generation and unique data analysis; computational pipeline of analyzing spatial metabolomics data

PhD Rotation Student, Tim Peterson, Sidharth Puram, Benjamin Humphreys Labs 8/2019 – 4/2020

Washington University in St. Louis

- Peterson Lab: Understanding the intracellular effects of Cationic Amphipathic Drugs on organelles
- Puram Lab: Studying head and neck cancer by CITE-seq
- Humphreys Lab: Characterizing kidney injury and repair markers by RNAscope

Visiting Student, Aaron Ring Lab 6/2018 – 4/2019

Department of Immunobiology, Yale University

- Modulating immune cytokines by protein engineering

Undergraduate Researcher, Wei Yan Lab 9/2016 – 7/2018

Shanghai Center for Systems Biomedicine, Shanghai Jiao Tong University

- Identification of biomarkers of lymphoma with mass spectrometry; clinic proteomics

Summer Intern, Manyuan Long Lab 6/2017 – 8/2017

Department of Ecology and Evolution, The University of Chicago

- Identification of mammalian positively selected genes by polygenetic analysis

Science Olympiad (Mathematics), Shandong Province Team, China 7/2014 – 2/2015

- Top10 students selected to participate in the Chinese Mathematics Olympics

SKILLS

Wet lab experiment

- Extensive experience in single-cell and single-nucleus library generation from diverse technologies, including 10X Genomics, sci-RNA-seq, SHARE-seq and INTACT, as well as multimodal profiling including RNA-seq, ATAC-seq, CARLIN and CITE-seq
- Extensive experience in molecular biology technologies such as cloning, vector construction, qPCR, immunohistology, and in-situ hybridization
- Extensive experience in tissue culture including primary cell isolation, immunocytochemistry and Seahorse metabolic measurement
- Strong experience in animal work such as mouse kidney disease surgery (UUO/IRI) and tumor implantation
- Strong experience in clinical sample management and processing such as human kidney dissection
- Strong background in protein chemistry including mass spectrometry sample preparation & recombinant protein preparation and protein liquid chromatography

Computational workflow

- Extensive experience in using Python, R, Shell and Jupyter
- Extensive experience in single-cell sequencing data preprocessing and analysis including UMAP visualization, data integration, sample demultiplexing, cell trajectory interference, fate mapping, gene activity prediction and multimodal analysis at the million-cell level. This also includes spatial transcriptomics and metabolomics analysis.
- Strong experience in analysis of bulk RNA-seq, proteomics and metabolomics data
- Extensive experience in data mining and discovering biological insights
- Strong training background in mathematics

TEACHING EXPERIENCE

Assistant Instructor, Washington University in St. Louis 8/2022 – present

- Structural bioinformatics of proteins (Bio4525)

Peer Study Mentor, Washington University in St. Louis 1/2022 – 6/2022

- Genomics (Bio5488) and Python-based coding tutoring

Assistant Instructor, Washington University in St. Louis 1/2021 – 6/2021

- Genomics (Bio5488)

Undergraduate Teaching Assistant, Shanghai Jiao Tong University

- College Genetics Course (2/2019–6/2019)
- College Macrobiology Course (2/2018–6/2018)
- College Biochemistry Course (9/2017–1/2018)

PRESENTATIONS & POSTERS

Project Talk, CZI Single-Cell Biology Annual Meeting 11/2022

Speaker, Nephrology Division Research Seminars, Washington University in St. Louis 9/2022

Retreat Talk (MGG/CSB/HSG/IMSD programs), Washington University in St. Louis 9/2022

POSTER (**PDF**) | PhD program retreat, Washington University in St. Louis 9/2022

- Cell profiling defines metabolic dysregulation in kidney fibrosis

DBBS Friday Talks (MGG/CSB/HSG/IMSD programs), Washington University in St. Louis 5/2022

REBUILDING A KIDNEY Spring Meeting | lighting talk 4/2022

PhD Program Thesis Committee Meeting, Washington University in St. Louis 8/2021, 4/2022

REBUILDING A KIDNEY Work in Progress | small group meeting 12/2021

PhD Program Qualifying Examination Committee Meeting 9/2020

POSTER (**PDF**) | SJTU Academic Festival (Best Poster Award) 2/2019

- Modulating the Tumor-Targeting Specificity of "Decoy-Resistant" Interleukin-18 by Protein Engineering

POSTER (**PDF**) | Human Proteome Organization World Congress 10/2018

- Clinical Proteomics Analysis using Data Independent Acquisition-Mass Spectrometry (DIA-MS) Identified Classifiers for Molecular Characterization of Lymphoma

POSTER (**PDF**) | SJTU Academic Festival (Best Poster Award) 12/2017

- Detecting Positively Selected Genes among Mammalian Species Using Phylogenetic Analysis of Maximum Likelihood

HONORS & ACTIVITIES

Member, NCFDD (National Center for Faculty Development & Diversity)	2023 - present
Member, ASN (American Society of Nephrology)	2020 - present
Top 0.2% Bachelor Thesis of Shanghai Jiao Tong University (**URL**) (Thesis **PDF**)	2019
Outstanding Graduate in Bachelor Degree, Shanghai	2019
Academic Excellence Scholarship (First-class), Shanghai Jiao Tong University	2016, 2017, 2018
Rank #1 Student Presentation, National Biology Education Conference of Chinese Ministry of Education	2018
Vice President, Students' Union of Zhiyuan Honors Program, Shanghai Jiao Tong University	2017 - 2018
Top 0.1% in Chinese University Entrance Examination (681 points)	2015
Bronze medal, Chinese Mathematical Olympiad (CMO)	2014