

# Haikuo Li

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## EDUCATION

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### 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

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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)
  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.\*** (equal contribution), & 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\*., **Li, H.\*** (equal contribution), Wang, J.\*, et al. Yan, W.#, Jin, J.# (2022). Proteomic Portrait of Human Lymphoma Reveals Protein Molecular Fingerprint of Disease Specific Subtypes and Progression. **Phenomics**, 1-19. (PDF)

## RESEARCH EXPERIENCE

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- 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
  - Developing single-cell combinatorial indexing (split-pool barcoding) platforms
- 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

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### 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 inference, fate mapping, gene activity prediction and

multimodal analysis at the million-cell level

- 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

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<b>Assistant Instructor, Washington University in St. Louis</b>	8/2022 – present
• Structural bioinformatics of proteins (Bio4525)	
<b>Peer Study Mentor, Washington University in St. Louis</b>	1/2022 – 6/2022
• Genomics (Bio5488) and Python-based coding tutoring	
<b>Assistant Instructor, Washington University in St. Louis</b>	1/2021 – 6/2021
• Genomics (Bio5488)	
<b>Undergraduate Teaching Assistant, Shanghai Jiao Tong University</b>	
• College Genetics Course (2/2019–6/2019)	
• College Macrobiology Course (2/2018–6/2018)	
• College Biochemistry Course (9/2017–1/2018)	

## PRESENTATIONS & POSTERS

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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

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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