Haikuo **Li**

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Education

Washington University in St. Louis *8/2019 – 2024 (expected)*
Ph.D. Program in Molecular Genetics and Genomics, Division of Biology and Biomedical Sciences
- Thesis Mentor: Benjamin D. Humphreys, M.D., Ph.D.

Shanghai Jiao Tong University *9/2015 – 6/2019*
Bachelor of Science, Bioscience (Zhiyuan Honors Program)
- 2019 Top 0.2% Bachelor Thesis: Rank #1 in Bioscience
- 2019 Outstanding Graduate in Bachelor Degree, Shanghai

Research Interests

Single-cell multiomics; Systems biology; Genome science; Tissue injury, fibrosis and regeneration; Cancer

Research & Training Experiences

Benjamin Humphreys Lab, Washington University in St. Louis *4/2020 – 2024 (expected)*
PhD Student, advised by Benjamin D. Humphreys
- Developing a cell atlas of kidney fibrosis by single-cell multimodal profiling
- Studying metabolic mechanisms that drive kidney fibrogenesis
- Developing split-pool barcoding single-cell platforms

PhD Rotations, Washington University in St. Louis *8/2019 – 4/2020*
PhD Rotation Student, advised by Tim R. Peterson, Sidharth V. Puram, Benjamin D. Humphreys
- 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

Aaron Ring Lab, Department of Immunobiology, Yale University *7/2018 – 4/2019*
Visiting Undergraduate Researcher, advised by Aaron M. Ring
- Modulating immune cytokines by protein engineering

Wei Yan Lab, Shanghai Center for Systems Biomedicine, Shanghai Jiao Tong University *9/2016 – 7/2018*
Undergraduate Researcher, advised by Wei Yan
- Identification of biomarkers of lymphoma with mass spectrometry; clinic proteomics

Manyuan Long Lab, Department of Ecology and Evolution, The University of Chicago *6/2017 – 8/2017*
Summer Intern, advised by Manyuan Long
- 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

Publications

Comprehensive single-cell transcriptional profiling defines shared and unique epithelial injury responses during kidney fibrogenesis *Cell Metabolism (invited for revision after peer review)*
Haikuo Li, Eryn E. Dixon, Haojia Wu, Benjamin D. Humphreys

New functions for basophils identified in kidney fibrosis (PDF) *Nature Immunology, 2022*
Haikuo Li, Benjamin D. Humphreys

Single-cell transcriptomics (book chapter) *Innovations in Nephrology: Breakthrough Technologies in Kidney Disease Care (in press)*
Yoshiharu Muto*, **Haikuo Li***(equal contribution), Benjamin D. Humphreys

Single Cell Technologies: Beyond Microfluidics (PDF) *Kidney360, 2021*
Haikuo Li, Benjamin D. Humphreys
(Twitter Discussion #1) (Twitter Discussion #2)

Surveying the Human Single Cell Landscape (PDF) *Kidney International, 2020*
Haikuo Li, Benjamin D. Humphreys
(News #1) (News #2)

Proteomic portrait of human lymphoma revealed protein molecular fingerprint for disease specific subtypes and progression *Phenomics (under review)*
Xin Ku*, **Haikuo Li***(equal contribution), et al., Jie Jin#, Wei Yan#

Presentations & Posters

DBBS Friday Talks (MGG/CSB/HSG/IMSD programs), Washington University in St. Louis *5/2022*
REBUILDING A KIDNEY Spring Meeting | lighting talk *4/2022*
REBUILDING A KIDNEY Work in Progress | small group meeting *12/2021*
PhD Program Thesis Committee Meeting *8/2021, 4/2022*
PhD Program Qualifying Examination Committee Meeting *9/2020*
POSTER **(PDF)** | Clinical Proteomics Analysis using Data Independent Acquisition-Mass Spectrometry (DIA-MS) Identified Classifiers for Molecular Characterization of Lymphoma
Human Proteome Organization World Congress 2018
POSTER **(PDF)** | Modulating the Tumor-Targeting Specificity of "Decoy-Resistant" Interleukin-18 by Protein Engineering
SJTU Academic Festival 2019
POSTER **(PDF)** | Detecting Positively Selected Genes among Mammalian Species Using Phylogenetic Analysis of Maximum Likelihood
SJTU Academic Festival 2017

Academic Honors

Top 0.2% Bachelor Thesis of Shanghai Jiao Tong University (**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, Guangdong *2018*
Top 0.1% in Chinese University Entrance Examination (681 points) *2015*
Silver medal, Chinese Mathematical Olympiad (CMO), Chongqing *2014*

Other Activities

Peer Study Mentor, Genomics (Bio5488), Washington University in St. Louis School of Medicine *1/2022 – 4/2022*
Teaching Assistant, Genomics (Bio5488), Washington University in St. Louis School of Medicine *1/2021 – 5/2021*
Member, ASN (American Society of Nephrology) *8/2020 – Present*
Teaching Assistant, College Genetics Course, Shanghai Jiao Tong University *2/2019 – 6/2019*
Teaching Assistant, College Macrobiology Course, Shanghai Jiao Tong University *2/2018 – 6/2018*
Vice President, Students' Union of Zhiyuan Honors Program, Shanghai Jiao Tong University *6/2017 – 3/2018*
Teaching Assistant, College Biochemistry Course, Shanghai Jiao Tong University *9/2017 – 1/2018*

Personal Statement

In high school, I was most interested in mathematics and won the Silver Medal in 2014 Chinese Mathematics Olympics. At that point, I learned that biology had entered a big data era and required multidisciplinary approaches such as mathematical modelling and statistics to solve cutting-edge genomic problems. Therefore, I chose bioscience as my undergraduate major at Shanghai Jiao Tong University (SJTU). At SJTU, I was mainly trained in biochemistry and systems biology and led a first-author project in which we identified biomarkers for lymphoma patients with mass spectrometry-based proteomics. I worked as an undergraduate researcher at Yale University Department of Immunobiology in my 4th year to broaden my knowledge in immunology. At WashU DBBS, I matriculated in the Program in Biochemistry, Biophysics and Structural Biology with my background in proteomics. During my first-year PhD training at WashU, I learned that advances in single-cell genomics improved our understanding of tissue heterogeneity and underlying cellular events in disease, and therefore, I transferred to the Program in Molecular Genetics and Genomics with huge passion in using single-cell technologies to better precision medicine.

Since joining the Humphreys Lab in 2020, I have developed deep expertise in both wet-lab (single-cell library generation, technology development, mouse surgery, tissue culture, microscope imaging *etc*.) and dry-lab skills (single-cell data preprocessing, analysis, visualization and computational modelling), and have completed four first author review or commentary articles on single-cell technology development and applications (two published; two in press). My thesis projects aim to decipher cellular events that drive kidney fibrosis with high-throughput single-cell multiomics approaches. We specifically selected single-cell combinatorial indexing (sci) as the platform, leveraging its unique advantage in ultra-high throughput, sample multiplexing capacity and low costs, compared to the current popular 10X Genomics solution. My first project has led to a first author research article under peer review by Cell Metabolism, in which we used sci-RNA-seq to study metabolic dysregulation in kidney fibrosis. My second ongoing project will develop a large-scale human cell atlas of kidney fibrosis with a multimodal sci-based method and seeks to provide potential therapeutic targets to ameliorate kidney fibrosis.