



MUSU YUAN

Email: musu.yuan@pennmedicine.upenn.edu

Homepage: <https://ddb-qiwang.github.io/>

Github: github.com/ddb-qiwang

EDUCATION

Postdoctoral Researcher <i>Department of biostatistics, advised by Dr. Mingyao Li</i> University of Pennsylvania, Perelman School of Medicine	July. 2026 – Philadelphia, United States
Visiting Student <i>Department of biostatistics, advised by Dr. Mingyao Li</i> University of Pennsylvania, Perelman School of Medicine	Aug. 2024 – Jan. 2025 Philadelphia, United States
Ph.D. of Science <i>Integrated Life Sciences (biostatistics), advised by Dr. Minghua Deng</i> Peking University, Academy for Advanced Interdisciplinary Science	Sep. 2021 – June 2026 Beijing, China
Bachelor of Science <i>Statistics</i> Peking University, School of Mathematical Science	Sep. 2017 – June 2021 Beijing, China

RESEARCH INTEREST

My research interest lies in the broad fields of biostatistics.

My previous research majorly lies in following domains:

Single-cell & spatial transcriptomics/multi-omics data analysis

PUBLICATIONS

Smart spatial omics (S2-omics) optimizes region of interest selection to capture molecular heterogeneity in diverse tissues

Musu Yuan, Kaitian Jin, Hanying Yan, Amelia Schroeder, Chunyu Luo, Sicong Yao, Bernhard Dumoulin, Jonathan Levinsohn, Tianhao Luo, Jean R. Clemenceau, Inyeop Jang, Minji Kim, Yunhe Liu, Minghua Deng, Emma E. Furth, Parker Wilson, Anupma Nayak, Idania Lubo, Luisa Maren Solis Soto, Linghua Wang, Jeong Hwan Park, Katalin Susztak, Tae Hyun Hwang, Mingyao Li*
Nature Cell Biology (JCR Q1), 27, 2225–2238 (2025)

SPANN: Annotating single-cell resolution spatial transcriptome data with scRNA-seq data

Musu Yuan[†], Hui Wan[†], Minghua Deng*
Briefings in Bioinformatics (JCR Q1), Volume 25, Issue 2, March 2024, bbad533

Clustering single-cell multi-omics data with MoClust

Musu Yuan, Liang Chen*, Minghua Deng*
Bioinformatics (JCR Q1), Volume 39, Issue 1, January 2023, btac736

scMRA: a robust deep learning method to annotate scRNA-seq data with multiple reference datasets

Musu Yuan[†], Liang Chen[†], Minghua Deng*
Bioinformatics (JCR Q1), Volume 38, Issue 3, February 2022, Pages 738–745

Clustering CITE-seq data with a canonical correlation-based deep learning method

Musu Yuan, Liang Chen, Minghua Deng*
Frontiers in Genetics (JCR Q2), Volume 13 - 2022

scPLAN: A hierarchical computational framework for single transcriptomics data annotation integration and cell-type label refinement

Qirui Guo[†], **Musu Yuan**[†], Lei Zhang*, Minghua Deng*
Briefings in Bioinformatics (JCR Q1), Volume 25, Issue 4, July 2024, bbae305

Improving Tree Probability Estimation with Stochastic Optimization and Variance Reduction

Tianyu Xie[†], **Musu Yuan**[†], Minghua Deng*, Cheng Zhang*
Statistics and Computing (JCR Q1), Volume 34, article number 186, (2024)

Continually adapting pretrained language model to universal annotation of single-cell RNA-seq data

Hui Wan, **Musu Yuan**, Yiwei Fu, Minghua Deng*
Briefings in Bioinformatics (JCR Q1), Volume 25, Issue 2, March 2024, bbae047

PREPRINTS

HistoSweep enables cellular-resolution tissue quality control for gigapixel images in digital pathology and spatial omics

Amelia Schroeder, Xiaokang Yu, Wei Li, Liran Mao, **Musu Yuan**, Jiyuan Yang, Nadja Sachs, Bernhard Dumoulin, George X. Xu, Xunda Luo, Alexander Huang, Katalin Susztak, Tae Hyun Hwang, Humam Kadara, Lars Maegdefessel, Jiyang Yu, Mingyao Li*

Multiscale confidence quantification for virtual spatial transcriptomics with UTOPIA

Kaitian Jin, Zihao Chen, Xiaokang Yu, **Musu Yuan**, Amelia Schroeder, Bernhard Dumoulin, Yunhe Liu, Linghua Wang, Jeong Hwang Park, Tae Hyun Hwang, Katalin Susztak, Zhimei Ren, Nancy Zhang, Mingyao Li*

HONORS AND AWARDS

Yuehua Luo Scholarship Merit based scholarship for Ph.D. students in Peking University	2025 Fall
Peking University Merit Student Recognition for top 10% of students in academics at Peking University	2024-2025
Dean Scholarship Recognition for top 10% of students in academics at Peking University	2024 Fall
Dean Scholarship Recognition for top 10% of students in academics at Peking University	2023 Fall
Quantitative Biology research Third-Class Scholarship Merit based scholarship for Ph.D. students in Peking University	2023 Fall
Peking University Third-Class Scholarship Merit based scholarship for Ph.D. students in Peking University	2023 Fall
Dean Scholarship Recognition for top 10% of students in academics at Peking University	2022 Fall
Peking University Merit Student Recognition for top 10% of students in academics at Peking University	2021-2022
Honorable Mention Recognition for top 20% of participants in Mathematical Contest In Modeling (MCM)	2020 Spring
Gold Medal Recognition for top 120 of participants in Chinese Mathematical Olympiad (CMO)	2016 Winter