

Jingtao Wang
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RESEARCH INTEREST

My research focuses on developing AI methods, such as deep generative models, to handle complex biological data, particularly single-cell omics, with the goal of uncovering insights that bridge gaps in our understanding of cellular processes. By advancing computational approaches to address challenges in omics data analysis, I aim to drive discoveries that enhance our understanding of disease mechanisms and inform advancements in diagnostics and therapeutics.

EDUCATION

Degree Programs:

McGill University , Montreal, Canada	GPA: 4.00/4.00
<i>Doctor of Philosophy, Experimental Medicine, September 2021 - Present</i>	
Supervisors: Dr. Jun Ding and Dr. Gregory Fonseca	
Selected Coursework: Reinforcement Learning	Molecular Meths in Medical Research
Carnegie Mellon University , Pittsburgh, USA	GPA: 3.93/4.33
<i>Master of Science, Automated Science, August 2019 - June 2021</i>	
Selected Coursework: Fundamentals of Bioinformatics	Applied Cell and Molecular Biology
Machine Learning for Scientists	Automated Laboratory Methods I&II
Harbin Institute of Technology , Harbin, China	Major GPA: 85.10/100
<i>Bachelor of Engineering, Computer Science and Technology, September 2014 - June 2018</i>	
Selected Coursework: Operation Research and Optimization	The Design and Analysis of Algorithms
Data Structures and Algorithms	Design and Practice of Software I&II

Visiting Studies:

Columbia University , New York, NY, USA	GPA: 3.67/4.33
<i>Harbin Institute of Technology visiting student program, August-December 2016</i>	
Selected Coursework: Computer Science Theory, Statistical Machine Learning	
National University of Singapore , Singapore	GPA: A+
<i>Harbin Institute of Technology visiting student program, July-August 2016</i>	
Selected Coursework: Biometrics in Depth	

TOP CONFERENCE PRESENTATIONS

- *Research in Computational Molecular Biology Satellite Conference (RECOMB-CSB) — Oral Presentation*
"scCross: A Deep Generative Model for Unifying Single-Cell Multi-Omics with Seamless Integration, Cross-Modal Generation, and In Silico Exploration", Seoul, April 26-29, 2025
- *Research in Computational Molecular Biology (RECOMB) — Poster Presentation & Lightning Talk*
"RAMEN Efficiently Unveils Clinical Variable Networks for Complex Diseases Using Absorbing Random Walks and Genetic Algorithms", Seoul, April 26-29, 2025
- *Intelligent Systems for Molecular Biology (ISMB) — Oral Presentation*
"Enabling Affordable Single-Cell Data in Large Cohort Studies via Deep Generative Neural Networks and Active Learning", Montreal, July 20-24, 2024

GRANTS & FUNDING

Digital Research Alliance of Canada – Resources for Research Groups (RRG) Grant
Project: Decoding Cellular Dynamics in Complex Diseases with Deep Generative AI for In-Silico Therapeutics
Role: Co-contributor **PI:** Dr. Jun Ding | **Awarded Resources:** 200 core-years (CPU), 64 RGU-years (GPU), 200 TB storage **Total Value:** ~\$111,460 CAD | **Status:** Awarded, Active (July 2025 – April 2026)

PUBLICATIONS

Published Work (†: Co-first authors)

Wang, Jingtao , Gregory J. Fonseca, and Jun Ding. "scSemiProfiler: Advancing large-scale single-cell studies through semi-profiling with deep generative models and active learning." *Nature communications* 15.1 (2024): 5989.

- **Highlighted by the editors as a Top 50 paper in the field**
- **Featured in *Nature*: Technology Feature [Link](#)**

Xiong, Yiwei[†], **Jingtao Wang**[†], Xiaoxiao Shang, Tingting Chen, Douglas D. Fraser, Gregory Fonseca, Simon Rousseau, and Jun Ding. "Efficient and scalable construction of clinical variable networks for complex diseases with RAMEN." *Cell Reports Methods*, Accepted, 2025.

Song, Qi, **Jingtao Wang**, and Ziv Bar-Joseph. "scSTEM: clustering pseudotime ordered single-cell data." *Genome Biology* 23.1 (2022): 150.

Hasanaj, Euxhen, **Jingtao Wang**, Arjun Sarathi, Jun Ding, and Ziv Bar-Joseph. "Interactive single-cell data analysis using Cellar." *Nature communications* 13.1 (2022): 1998.

Pang, Steph A., Manuel Flores Molina, Pamela Thébault, Yuming Zheng, Hsiang Chou, Christophe Goncalves, **Jingtao Wang**., et al. "Molecular predictors and mechanisms of immune checkpoint inhibitor-induced myocarditis: A case-control study with translational correlates." *Journal of Clinical Oncology* 42, no. 16_suppl (2024): 12031-12031.

Accepted Publication

Wagner, D.E., Alsafadi, H.N., Mitash, N., ... **Wang, J.**, Sembrat, J., Hilgendorff, A., Ding, J., Günther, A., et al. "Inhibition of epithelial cell YAP-TEAD/LOX signaling attenuates pulmonary fibrosis." *Nature Communications*, 2025.

Preprints

Pumeng, Shi[†], **Jingtao Wang**[†], Hijazin Michel[†], and Jun Ding. "DTPSP: A Deep Learning Framework for Optimized Time Point Selection in Time-Series Single-Cell Studies." *bioRxiv* (2024): 2024-12.

Tai, Huilin [†], Qian Li [†], **Jingtao Wang** [†], Jiahui Tan, Ryann Lang, Basil J. Petrof, and Jun Ding. "CellSexID: Sex-Based Computational Tracking of Cellular Origins in Chimeric Models." *bioRxiv* (2024): 2024-12.

(Under revision at *Cell Reports Methods*)

Papers to be Submitted

Wang, Jingtao[†], Pumeng Shi[†], Nicole Heimbach, David Eidelman, and Jun Ding. "Universally Enhancing Deep Learning Models by Injecting Human Knowledge Through Task-Driven Reverse Probing."

Wang, Jingtao, Sinian Zhang, and Jun Ding. "Transforming Deep Learning with Genetic Algorithms: A Comprehensive Framework for Enhancing Structure Learning, Optimization, and Backpropagation Surrogates."

HONORS

2025 RI-MUHC Studentship and Fellowship Competition, Ph.D.

Top 50 Best Papers in *Nature Communications* Editors' Highlights (Biotechnology and Methods Category), 2024

MEAKINS-CHRISTIE LABORATORIES 2022-2023 COLLABORATIVE RESEARCH AWARD

MEAKINS-CHRISTIE LABORATORIES 2021-2022 COLLABORATIVE RESEARCH AWARD

Harbin Institute of Technology Second-class Scholarship, 2017

OTHER PRESENTATION & TEACHING

Meakins Genomics Workshop **Teaching Assistant**, Aug 2022 and Aug 2024

RI-MUHC Respiratory Research Day **Oral Presentation**, Apr 2024

RI-MUHC Respiratory Research Day **Poster Presentation**, Jun 2023

RESEARCH CONTRIBUTIONS & COLLABORATIONS

BMC Genomics Paper Review (May 2025)

Computational and Structural Biotechnology Paper Review (April 2025)

Nature Communications Paper Review (Jan 2025)

PLOS Computational Biology Paper Review (Jan 2025)

Nature Communications Paper Review (Sep 2024)

SickKids Myocarditis Single-Cell Data Analysis (Mar 2024)

Biobanque québécoise de la COVID-19 (BQC-19) Patient Data Analyses (Oct 2021)

OTHER RESEARCH EXPERIENCES

Capstone Project, Carnegie Mellon University (Sep 2020 – Dec 2020)

Automated HeLa cell line staining, imaging, and passage using robotic labware. Conducted comparative analysis of manual versus robotic performance in these operations.