

JIAN ZOU

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RESEARCH INTEREST

Development and application of statistical/machine learning methods on clinical and high dimensional omics data

EDUCATION

Ph.D. in Biostatistics Sep. 2019 – April 2023

School of Public Health, University of Pittsburgh, Pittsburgh, USA

- GPA: 3.93/4.00
- Advisor: George C. Tseng; Co-advisor: Steffi Oesterreich & Adrian V. Lee
- Thesis: *Clustering, Biomarker and Cancer Model Selection Using Omics Data*

M.Sc. in Biostatistics (Theory and Method track) Sep. 2017 – May 2019

Mailman School of Public Health, Columbia University, New York, USA

- GPA: 4.00/4.33
- Advisor: Bin Cheng & Ying Wei
- Practicum: *Statistical Evaluation and Selection of Normalization Methods for microRNA Sequencing Data in Cancer Biomarker Studies*

B.Sc. in Biotechnology and Applied Chemistry (Dual Degree) Sep. 2013 – June 2017

School of Life Science, Central China Normal University (CCNU), Wuhan, China

- GPA: 3.85/4.00
- Advisor: Xu Yang & Rui Li
- Thesis: *Effects of Tea Polyphenols on Neurotoxicity in Mice*

EXPERIENCE

Associate Professor (Young Innovators) Aug. 2023 – Present

Department of Statistics, School of Public Health, Chongqing Medical University *Chongqing, China*

Statistical learning methods and their applications in cancer biology

Graduate Student Researcher Sep. 2019 – May 2023

University of Pittsburgh Medical Center (Advisor: Steffi Oesterreich & Adrian Lee) *Pittsburgh, USA*

Comparison of multi-omics data before and after hormone therapy

Microenvironment analysis in patients with primary breast cancer and brain metastasis

Prognostic impact of sentinel lymph node biopsy and radiotherapy in elderly patients with breast cancer

Multi-center retrospective cohort study on breast cancer

Research Intern Jan. 2019 – May 2019

Memorial Sloan Kettering Cancer Center (Advisor: Li-Xuan Qin) *New York, USA*

Statistical evaluation and selection of normalization methods for microRNA sequencing data

Dental malpractice data analysis from National Practitioner Data Bank

Statistical method development for multivariate count data modeling with a latent variable approach

PUBLICATIONS

†: Co-first author; *: Corresponding/senior author

1. Peng Liu†, Yuchen Pan†, Rick Chang†, Yusi Fang, Xiangning Xue, **Jian Zou**, Jessica M. Toothaker, Oluwabunmi Olaloye, Eduardo Gonzalez Santiago, Vanessa Mitsialis, Pietro Prescicce, Suhas Kallapur, Scott Snapper, Jia-Jun Liu, George C. Tseng*, Liza Konnikova*, Silvia Liu*. (2024) Comprehensive evaluation and practical guideline of gating methods for high-dimensional cytometry data: manual gating, unsupervised clustering, and auto-gating, *Briefings in Bioinformatics*, 26(1), bbae633.
2. **Jian Zou**, Zheqi Li, Neil Carleton, Steffi Oesterreich, Adrian V Lee, George C. Tseng* (2024). Mutual information for detecting multi-class biomarkers when integrating multiple bulk or single-cell transcriptomic studies, *Bioinformatics*, 40(12), btae696.
3. Fangyuan Chen, Sayali Onkar, **Jian Zou**, Yujia Li, Haley Arbore, Sai Maley, George Tseng, Peter C Lucas, Tullia C Bruno, Dario AA Vignali, Julia Foldi, Marija Balic, Adrian V. Lee*, Steffi Oesterreich* (2024). Immune infiltration correlates with transcriptomic subtypes in primary estrogen receptor positive invasive lobular breast cancer, *npj Precision Oncology*, 8(1), 257.
4. Qixuan Cao, Jie Fan, **Jian Zou***, Wei Wang* (2024). Multi-omics analysis identifies BCAT2 as a potential pancreatic cancer biomarker for tumor progression and immune microenvironment modulation, *Scientific Reports*, 14, 23371.
5. Neil Carleton, Thomas R. Radomski, Danyang Li, **Jian Zou**, ..., Steffi Oesterreich, George Tseng, Adrian V. Lee, Priscilla F. McAuliffe* (2024). Electronic health record-based nudge intervention and axillary surgery in older women with breast cancer: a nonrandomized controlled trial, *JAMA Surgery*, Published online July 17, 2024.
6. **Jian Zou**, Osama Shah, Yu-Chiao Chiu, Tianzhou Ma, Jennifer M Atkinson, Steffi Oesterreich*, Adrian V. Lee*, George C. Tseng* (2024). Systems approach for congruence and selection of cancer models towards precision medicine, *PLoS Computational Biology*, 20(1), e1011754.
7. George Tseng*, Tianzhou Ma, **Jian Zou** (2023). Of mouse models and humans, *American Scientist*, 111(4), 213-214. (An invited, non-peer-reviewed article)
8. Sayali Onkar, Jian Cui, **Jian Zou**, Carly Cardello, Anthony R Cillo, Mostofa Rafid Uddin, April Sagan, Marion Joy, Hatice U Osmanbeyoglu, Katherine Pogue-Geile, Priscilla F. McAuliffe, Peter C. Lucas, George C. Tseng, Adrian V Lee, Tullia C Bruno, Steffi Oesterreich*, Dario A.A.Vignali* (2023). Immune landscape in invasive ductal and lobular breast cancer reveals a divergent macrophage-driven microenvironment, *Nature Cancer*, 1-19.
9. Wei Zong, Tanbin Rahman, Li Zhu, Xiangrui Zeng, Yingjin Zhang, **Jian Zou**, Song Liu, Zhao Ren, Jingyi Jessica Li, Etienne Sibille, Adrian V. Lee, Steffi Oesterreich, Tianzhou Ma*, George C. Tseng* (2023). Transcriptomic congruence analysis for evaluating model organisms, *Proceedings of the National Academy of Sciences*, 120(6), e2202584120.
10. Steffi Oesterreich†*, Azadeh Nasrazadani†, **Jian Zou**†, Neil Carleton, ..., George Tseng, Adrian V. Lee, Nicole Williams*, Megan Kruse* (2022). Clinicopathological features and outcomes comparing patients with invasive

ductal and lobular breast cancer, *JNCI: Journal of the National Cancer Institute*, 114(11), 1511-1522.

11. **Jian Zou**[†], Yannick Düren[†], and Li-Xuan Qin^{*} (2022). PRECISION.seq: An R package for benchmarking depth normalization in microRNA sequencing. *Frontiers in Genetics*, 12.
12. Neil Carleton, **Jian Zou**, Yusi Fang, ..., George C. Tseng, Oscar C. Marroquin, Adrian V. Lee^{*}, Priscilla F. McAuliffe^{*} (2021). Outcomes after sentinel lymph node biopsy and radiotherapy in older women with early-stage, estrogen receptor-positive breast cancer, *JAMA Network Open*, 4(4), e216322-e216322.
13. Terrell E. Jones, **Jian Zou**, George C. Tseng, Somak Roy, Rohit Bhargava^{*} (2021). The utility of next-generation sequencing in advanced breast and gynecologic cancers: experience of a large tertiary care women's hospital, *American Journal of Clinical Pathology*, 156(3), 455-460.
14. Li-Xuan Qin^{*}, **Jian Zou**, Jiejun Shi, Ann Lee, Aleksandra Mihailovic, Thalia A. Farazi, Thomas Tuschl, Samuel Singer (2020). Statistical assessment of depth normalization for small RNA sequencing, *JCO Clinical Cancer Informatics*, 4, 567-582.
15. Peng Liu, Silvia Liu, Yusi Fang, Xiangning Xue, **Jian Zou**, George C. Tseng^{*}, Liza Konnikova^{*} (2020). Recent advances in computer-assisted algorithms for cell subtype identification of cytometry data, *Frontiers in Cell and Developmental Biology*, 8, 234.

PRESENTATIONS

Invited

1. Mutual information for detecting multi-class biomarkers when integrating multiple omics studies
7th International Conference on Econometrics and Statistics, Beijing/Virtual, July 2024
2. Systems approach for congruence and selection of cancer models towards precision medicine (talk)
ICSA China Conference, Wuhan, June 2024
3. Webinar on statistical evaluation and selection of depth normalization in small RNA sequencing
(joint with Li-Xuan Qin and Yannick Düren)
Computational Genomics and Bioinformatics Branch, National Cancer Institute, virtual, February 2024
4. Statistical assessment of depth normalization methods for microRNA sequencing
11th ICSA International Conference, Hangzhou, December 2019

Contributed

5. Systems approach for congruence and selection of cancer models towards precision medicine (talk)
Joint Bioconductor Asia and Hong Kong Bioinformatics Symposium, Hong Kong, October 2023
6. Transcriptomic congruence and selection of representative cancer models towards precision medicine (talk)
ENAR Spring Meeting, Nashville, March 2023
7. CGMM: An algorithm for constrained model-based clustering (poster)
ICSA Applied Statistics Symposium, Gainesville, June 2022; Symposium on Data Science & Statistics, Pittsburgh, June 2022; ASA Pittsburgh Spring Banquet, Pittsburgh, April 2022

8. Congruence analysis to optimally select representative cell lines for breast cancer histological subtypes (poster)
NISS Graduate Student Research Conference, May 2022
9. Abstract PS11-02: Comprehensive comparative analysis of invasive ductal and lobular breast cancer cases in great lakes breast cancer consortium (3rd author) (poster)
San Antonio Breast Cancer Symposium, December 2020
10. Abstract PS1-10: Outcomes after sentinel lymph node biopsy and radiation therapy in women over 70 years old with ER+, HER2-, clinically node negative breast cancer (3rd author) (poster)
San Antonio Breast Cancer Symposium, December 2020

GRANTS

Funding Agency:	Chongqing Excellent Youth Project
Title:	Application and optimization of data harmonization methods in predictive models for breast cancer drug response
Years Inclusive:	Jan. 2025 - Dec. 2027
Role on Grant:	Principal Investigator
Funding Agency:	Chongqing Overseas Returnees Entrepreneurship and Innovation Support Program
Title:	Study on drug selection for elderly breast cancer patients based on multi-omics data
Role on Grant:	Principal Investigator
Funding Agency:	NIH/NCI 5R01CA252378-02
Title:	Credentialing models of invasive lobular breast cancer for translational research
Years Inclusive:	April 2021 - March 2026
Principal Investigators:	Steffi Oesterreich & Adrian V. Lee
Role on Grant:	Graduate Student Researcher
Funding Agency:	NIH/NCI 5R01CA221303-05
Title:	Mechanism-based strategies to target ER-mutant endocrine resistant breast cancer
Years Inclusive:	April 2018 - March 2023
Principal Investigator:	Steffi Oesterreich
Role on Grant:	Graduate Student Researcher
Funding Agency:	NIH/NCI 5R01CA224909-05
Title:	FGFR4: A druggable mediator of endocrine resistance in breast cancer
Years Inclusive:	Dec. 2017 - Nov. 2023
Principal Investigator:	Steffi Oesterreich
Role on Grant:	Graduate Student Researcher

AWARDS

• Chongqing High-Level Talent Program (IV), <i>Municipal Human Resources & Social Security Administration</i>	Sep. 2024
• Dean’s Service Award, <i>Pitt Public Health</i>	April 2023
• BIOST Best Graduate Student Researcher Award, <i>Pitt Biostat</i>	April 2023
• Student & Early Career Travel Award, <i>2022 Symposium on Data Science & Statistics</i>	April 2022
• The Mihaela Serban Memorial Award for Best Poster Presentation, <i>ASA Pittsburgh Chapter</i>	April 2022
• Excellent Graduate, <i>CCNU</i>	Jun. 2017
• Second Prize, <i>National Life Science Innovation Experiment Contest</i>	Aug. 2016

STATISTICAL SOFTWARE

• MICA: R package for Multi-Study Multi-Class Concordance Analysis, available on GitHub	
• CASCAM: R package of Congruence Analysis and Selector of Cancer Models, available on GitHub	
• PRECISION.seq: R Package for Performance Assessment of Depth Normalization Methods in microRNA Sequencing, available on GitHub	

TEACHING

• Lecturer (Team Teaching), Public Health, <i>CQMU International School</i>	Fall 2024
• Lecturer (Team Teaching), Academic Writing, <i>CQMU Clinical Undergraduate Program</i>	Fall 2024
• Lecturer (Team Teaching), Practical Analysis Software for Medical Big Data, <i>CQMU Certificate Program</i>	Summer 2024
• Lecturer (Team Teaching), Respiratory and Cancer Precision Medicine, <i>CQMU International School</i>	Spring 2024
• Teaching Assistant, Statistical Methods for Omics Data, <i>Pitt Biostat</i>	Fall 2022
• Lecturer, Mathematical Methods for Statistics, <i>Pitt Biostat</i>	Fall 2021
• Teaching Assistant, Analysis of Categorical Data, <i>Columbia Biostat</i>	Summer 2018

ACADEMIC MEMBERSHIP

• Member, <i>International Biometric Society (IBS)</i>	2022 – Present
• Member, <i>International Chinese Statistical Association (ICSA)</i>	2021 – Present
• Member, <i>American Statistical Association (ASA)</i>	2020 – Present

ACADEMIC SERVICE

Editorial Board	
• Youth Editorial Board Member, <i>MedComm - Future Medicine</i>	2024 – Present
• Part-Time Editor (Statistical Methods), <i>MedComm</i>	2024 – Present
Journal Referee	
<i>Frontiers in Genetics</i> (1);	<i>Journal of Translational Medicine</i> (2); <i>Human Heredity</i> (1)
<i>MedComm</i> (7);	<i>BBA - Gene Regulatory Mechanisms</i> (1);
<i>BMC Medical Informatics and Decision Making</i> (1)	<i>MedComm - Future Medicine</i> (1);
International/National Organizations	
• Student Representative, <i>ASA Pitt Chapter</i>	2020 – 2023
• Member, <i>ASA SSGG Member Engagement Committee</i>	2020 – 2023

University Committees & Service

- Student Representative, *UPitt Biostat* 2020 – 2023

Conference Service

- Session Co-organizer, Novel Applications of Advanced Statistical Learning Methods to Biomedical Data June 2024
ICSA China Conference, Wuhan (jointly with Li-Xuan Qin)