

Kaiqiong Zhao – Curriculum Vitae

Website	https://kaiqiong.github.io Google scholar page	Email Github	kaiqiong@yorku.ca https://github.com/kaiqiong
----------------	--	-------------------------------	---

Employment

July 2023 – Present	Assistant Professor Department of Mathematics and Statistics, York University, Toronto, ON, Canada
Nov 2021 – June 2023	CANSSI Distinguished Postdoctoral Fellow Department of Mathematical and Statistical Sciences, University of Alberta, Edmonton, AB, Canada Department of Statistical Sciences, University of Toronto, Toronto, ON, Canada

Education

2016-2021	Ph.D. in Biostatistics – McGill University, Montréal, QC, Canada
2014-2016	M.Sc. in Computational biology – University of Manitoba, Winnipeg, MB, Canada
2013-2014	M.Sc. in Statistics – University of Windsor, Windsor, ON, Canada
2009-2013	B.Sc. in Statistics – Beijing Institute of Technology, Beijing, China

Funding

2025-2026	York Research Support Fund — \$5,000 Adapting bi-directional transformers for high-dimensional single-cell omics Role: Principal Investigator
2025-2026	CANSSI Graduate Student Enrichment Scholarships — \$15,000 Advancing research on foundational models for single-cell omics analysis Role: Co-Principal Investigator
2024-2029	NSERC Discovery Grant — \$30,000/year Novel statistical methods for complex data-enabled learning and causal discovery Role: Principal Investigator
2024-2025	NSERC Discovery Launch Supplement — \$12,500 Novel statistical methods for complex data-enabled learning and causal discovery Role: Principal Investigator
2024-2025	York Research Support Fund — \$5,000 Improve causal estimates in summary-data Mendelian randomization Role: Principal Investigator
2024-2025	York University Junior Faculty Fund — \$3,000 High-dimensional modelling in sequencing-derived DNA methylation data Role: Principal Investigator
2023-2024	York Research Support Grant — \$5,000 Heterogeneity-aware and privacy-preserving data integration via robust optimization Role: Principal Investigator
2023	York Start-Up Funds — \$25,000

Publications

[†]corresponding authors;

* co-first authorship

Peer-reviewed Publications

1. [†]**Zhao, K.**, Yang, Y., Oualkacha, K., Zeng, Y., Klein, K., Hudson, M., Colmegna, I., Bernatsky, S., & Greenwood, C.M.T. A novel high-dimensional model for identifying regional DNA methylation QTLs. *Bio-statistics* (2025). Accepted
2. [†]**Zhao, K.**, Oualkacha, K., Zeng, Y., Shen, C., Lakhal-Chaieb, L., Labbe, A., Klein, K., Hudson, M., Colmegna, I., Pastinen, T., Bernatsky, S., & Greenwood, C.M.T. Addressing dispersion in mis-measured multivariate binomial outcomes: a novel statistical approach for detecting differentially methylated regions in bisulfite sequencing data. *Statistics in Medicine* (2024). PMID: 38932470
3. Yu, P., **Zhao, K.**, Jiang, B., Petkova, E., Tarpey, T., Ogden, T.R. Associations between EEG-defined subgroups and antidepressant response: a joint mixture of probabilistic multilinear Principle Component Analysis modeling approach. *Statistics and Its Interface.* (2024).
4. Chauhan, U., **Zhao, K.**, Walker, J. & Mackey, J.R. Weighted trajectory analysis and application to clinical outcome assessment. *BioMedInformatics* (2023).
5. Yu, J.C.Y., Zeng, Y., **Zhao, K.**, et al. Novel insights into systemic sclerosis using a sensitive computational method to analyze Whole-Genome Bisulfite Sequencing data. *BMC Clinical Epigenetics* (2023). PMID: 37270501
6. *Lebeau, B., ***Zhao, K.**, Jangal, M., Zhao, T., Guerra, M., Greenwood, C.M.T. & Witcher, M. Single base-pair resolution analysis of DNA binding motif with MoMotif reveals an oncogenic function of CTCF zinc-finger 1 mutation. *Nucleic Acids Research* (2022). PMID: 35947648.
7. **Zhao, K.**, Oualkacha, K., Lakhal-Chaieb, L., Labbe, A., Klein, K., Ciampi, A., Hudson, M., Colmegna, I., Pastinen, T., Zhang, T., Daley, D. & Greenwood, C.M.T. A novel statistical method for modeling covariate effects in bisulfite sequencing derived measures of DNA methylation. *Biometrics* (2021). PMID: 32438470. [One of the top 10 most downloaded papers during its first 12 months of publication in *Biometrics*.]
8. Zeng, Y., **Zhao, K.**, Oros Klein, K., Shao, X., Fritzler, M.J., Hudson, M., Colmegna, I., Pastinen, T., Bernatsky, S. & Greenwood, C.M.T. Thousands of CpGs Show DNA Methylation Differences in ACPA-Positive Individuals. *Genes* (2021). PMID: 34573331.
9. Caillon, A., **Zhao, K.**, Klein, K., Greenwood, C.M.T., Lu, Z., Paradis, P. & Schiffrin, E. High systolic blood pressure at hospital admission is an important risk factor in models predicting outcome of COVID-19 patients. *American Journal of Hypertension* (2021). PMID: 33386395.
10. Moon, J., Monton, O., Smith, A., Garfinkle, R., **Zhao, K.**, Zelkowitz, P., Loiselle, C.G., Fiore Jr, J.F., Sender Liberman, A., Morin, N. and Faria, J. Interactive online informational and peer support application for patients with low anterior resection syndrome: patient survey and protocol for a multicentre randomized controlled trial. *Colorectal Disease* (2021). PMID: 33638278
11. Caminsky, N., Hamad, D., He, H.B., **Zhao, K.**, Boutros, M., Feldman, L.S., Lee, L. & Fiore, J.F. Optimizing discharge decision-making in colorectal surgery: a prospective cohort study of discharge practices in a recently implemented enhanced recovery pathway. *Colorectal Dis* (2021). PMID: 33423346.
12. Zhou, S., Butler-Laporte, G., Nakanishi, T., Morrison, D., Afilalo, J., Afilalo, M., Laurent, L., Pietzner, M., Kerrison, N., **Zhao, K.**, ..., Richards, M. A Neanderthal OAS1 Isoform Protects Against COVID-19 Susceptibility and Severity: Results from Mendelian Randomization and Case-Control Studies. *Nature Medicine* (2021). PMID: 33633408.
13. McGuirk, S., Audet-Delage, Y., Annis, M., Xue, Y., Vernier, M., **Zhao, K.**, ..., St-Pierre, J. Resistance to different anthracycline chemotherapeutics elicits distinct and actionable primary metabolic dependencies in breast cancer. *eLife* (2021). PMID: 34181531.
14. Manousaki, D., Forgetta, V., Keller-Baruch, J., **Zhao, K.**, Greenwood, C.M.T., Mooser, V., Bassett, J.D., Leslie, W.D. & Richards, J.B. A polygenic risk score as a risk factor for medication-associated fractures. *Journal of Bone and Mineral Research* (2020). PMID: 32511779.

15. Alqahtani, M., Garfinkle, R., **Zhao, K.**, Vasilevsky, C.A., Morin, N., Ghitulescu, G., Faria, J. & Boutros, M. Can we better predict readmission for dehydration following creation of a diverting loop ileostomy: development and validation of a prediction model and web-based risk calculator. *Surgical Endoscopy* (2020). PMID: 31451920.
16. Al-Masrouri, S., Garfinkle, R., Al-Rashid, F., **Zhao, K.**, Morin, N., Ghitulescu, G.A., Vasilevsky, C.A. & Boutros, M. Readmission for Treatment Failure After Nonoperative Management of Acute Diverticulitis: A Nationwide Readmissions Database Analysis. *Diseases of the Colon & Rectum* (2020). PMID: 31914114.
17. **Zhao, K.**, Jiang, L., Klein, K., Greenwood, C.M.T. & Oualkacha, K. CpG-set association assessment of lipid concentration changes and DNA methylation. *BMC proceedings* (2018). PMID: 30263044.
18. Jiang, L., **Zhao, K.**, Klein, K., Canty, A. J., Oualkacha, K. & Greenwood, C.M.T. Investigating potential causal relationships between SNPs, DNA methylation and HDL. *BMC proceedings* (2018). PMID: 30275877.
19. Lakhal-Chaieb, L., Greenwood, C.M.T., Ouhourane, M., **Zhao, K.**, Abdous, B. & Oualkacha, K. A smoothed EM-algorithm for DNA methylation profiles from sequencing-based methods in cell lines or for a single cell type. *Statistical applications in genetics and molecular biology* (2017). PMID: 29055941.
20. Ye, X., **Zhao, K.**, Wu, C., Hu, P. & Fu, H. Associations between genetic variants in immunoregulatory genes and risk of non-Hodgkin lymphoma in a Chinese population. *Oncotarget* (2017). PMID: 28060727.
21. Patton, M. J., McCorrister, S., Grant, C., Westmacott, G., Fariss, R., Hu, P., **Zhao, K.**, Blake, M., Whitmire, B., Yang, C., Caldwell, H.J. & McClarty, G. Chlamydial Protease-like Activity Factor and Type III Secreted Effectors Cooperate in the Inhibition of p65 Nuclear Translocation. *mBio* (2016). PMID: 27677792.

Honors, Awards and Fellowships

2021-2023	CANSSI Distinguished Postdoctoral Fellowships (\$70,000/ year)
2018-2021	Fonds de recherche du Québec – Santé (FRQS Doctoral award) (\$21,000/ year)
2018-2019	Graduate Excellence Award, McGill University (\$12,638)
2018	Graduate Research Enhancement and Travel Awards, McGill University (\$415)
2017-2018	Faculty of Medicine Internal Studentship, McGill University (\$12,000)
2016-2017	Graduate Excellence Award, McGill University (\$27,748)
2015	Selected as 1 of 4 departmental presenters, in 2016 Edge of Science & Medicine, U of Manitoba
2015	Graduate Study Travel Award, University of Manitoba (\$750)
2015	Travel award for attending CANSSI workshop “New Horizons in Copula Modeling” (\$1000)
2014	Entrance Scholarship, University of Manitoba (\$4000)
2013	Entrance Scholarship, University of Windsor (\$5500)
2012	Honorable Mention, Undergraduate Mathematical Contest in Modeling, COMAP , USA
2010	Silver Medalist, Beijing Undergraduate Mathematical Contest in Modeling, CSIAM , China

Teaching

York University

MATH 2526: Introduction to Applied Statistics
2026 Winter

MATH 4130B/6633: Introduction to the Theory and Methods of Time Series Analysis
2023 Fall; 2024 Fall; 2025 Fall

MATH 4330: Applied Categorical Data Analysis
2023 Fall; 2024 Fall; 2025 Fall

University of Alberta

STAT 161: Introductory Statistics for Business and Economics
2022 Winter

McGill University

EPIB 521: Regression Analysis for Health Sciences
2020 Winter

Supervision

Undergraduate	Yushi Huang Jingpu Ding Kelvin Li	Mitacs Globalink Intern, Summer 2025 Mitacs Globalink Intern, Summer 2025 Research Assistant, Summer 2024
Graduate	Solomon Shaevitch	Project supervision for MATH 6004 Mathematics Seminar, Fall 2024

Service to Department, University, and Profession

Department and University Service

- **Member, PhD Supervisory Committee**, Department of Mathematics and Statistics, York University
 - Nicolas Ewen (2024–present)
 - Munmun Roy (2024–present)
- **Member, Data Science Curriculum Committee**, Department of Mathematics and Statistics, York University (2023–present)
- **Member, Statistics Curriculum Committee**, Department of Mathematics and Statistics, York University (2023–present)
- **Member, Statistical Consulting Group**, York University (2023–present) — offering statistical expertise to research projects across the university

Professional Service

- **Mentor**, *Women in Statistics Program*, Statistical Society of Canada (2024–present) — mentoring and networking support for women in statistics and data science
- **Conference Sessions Organized and Chaired**
 - Session Organizer — *Statistical Innovations for Complex Data Analysis in Biomedical Research*, International Conference on Econometrics and Statistics, Beijing, China (2024)
 - Session Organizer — *Statistical Learning Methods and Applications*, International Chinese Statistical Association (ICSA) – Canada Chapter Symposium, Banff, AB (2022)
 - Chair — *North America Machine Learning, Optimization and Statistics Symposium*, Vancouver, BC (2023)
 - Chair — *Recent Advances in Statistical Genetics*, ICSA – Canada Chapter Symposium, Banff, AB (2022)
- **Volunteer**, 23rd Meeting of New Researchers in Statistics and Probability, Toronto, ON (2023)

Scholarly and Professional Review Service

- **Reviewer for scholarly journals:** *Journal of the American Statistical Association: Applications & Case Studies*, *The Annals of Applied Statistics*, *The American Statistician*, *Computational Statistics and Data Analysis*, *Bioinformatics*, *Genetic Epidemiology*, and *BMC Bioinformatics*
- **External Reviewer**, NSERC Discovery Grant (2025)

Talks and Seminars

Invited Talks

Aug 2025	High Dimensional Data Analysis Workshop, Beaver Island, Michigan, US
Feb 2025	Seminar , Department of Mathematics & Statistics, University of Guelph, Ontario, Canada
July 2024	Joint Conference on Statistics and Data Science in China, Yunnan, China
July 2024	International Conference on Econometrics and Statistics, Beijing, China
Jun 2024	International Chinese Statistical Association (ICSA) - Canada Chapter, Niagara Falls, ON, Canada
July 2023	North America Machine Learning, Optimization and Statistics Symposium, Vancouver BC
Mar 2023	Department of Statistics, University of Manitoba, Winnipeg, MB
Dec 2022	Department of Statistical Sciences Postdoctoral Day, Toronto, ON
Jul 2022	International Chinese Statistical Association (ICSA)-Canada Chapter, Banff, AB
Jun 2022	Statistical Society of Canada (SSC), Virtual
Apr 2021	Jewish General Hospital Epidemiology Seminar Series, Montréal, QC, Virtual
Dec 2020	Bioinformatics-Biostatistics Research Seminar Series, University of Manitoba, Winnipeg, MB, Virtual
Dec 2020	McGill Initiative in Computational Medicine Research Day, Montréal, QC, Virtual
Oct 2020	Statistics Seminar , Département de mathématiques, UQAM, Montréal, QC, Virtual
Feb 2019	Statistical Genetics Group Seminar , Jewish General Hospital, Montréal, QC
Feb 2015	Seminar , Department of Biochemistry and Medical Genetics, University of Manitoba, Winnipeg, MB

Contributed Talks

Sep 2020	(Bio)Statistics Research and Career Day, McGill University, Montréal, QC
Aug 2018	BIRS Workshop: New Statistical Methods for Family-Based Sequencing Studies, Banff, AB
June 2018	7th Annual Canadian Human and Statistical Genetics Meeting, Harrison Hot Spring, BC
June 2018	Statistical Society of Canada, Montréal, QC
June 2017	Statistical Society of Canada, Winnipeg, MB
June 2016	Canadian Society for Epidemiology and Biostatistics, Winnipeg, MB
Jan 2016	Edge of Science & Medicine, Faculty of Health Sciences, University of Manitoba, Winnipeg, MB
Jun 2015	Statistical Society of Canada Student Conference, Halifax, NS

Poster Presentations

Oct 2019	Annual International Genetic Epidemiology Society Meeting, Houston, Texas, USA
June 2019	8th Annual Canadian Human and Statistical Genetics Meeting, Montebello, QC
Sep 2018	(Bio)Statistics Research Day, Montréal, QC
Mar 2017	Genetic Analysis Workshop 20, San Diego, CA, USA
Apr 2016	5th Annual Canadian Human and Statistical Genetics Meeting, Halifax, NS
Oct 2015	11th Annual Canadian Chronic Lymphocytic Leukemia (CLL) Meeting, Winnipeg, MB
Sep 2015	Child Health Research Day, Winnipeg, MB

Software Development

R packages

- **SOMNiBUS** (<https://www.bioconductor.org/packages/release/bioc/html/SOMNiBUS.html>)
A method for estimating smooth covariate effects and identifying differentially methylated regions, which copes with experimental errors and provides reliable inference.
- **sparseSOMNiBUS** (<https://github.com/kaiqiong/sparseSOMNiBUS>), coded with **Rcpp**
A sparse-smooth modeling method for identifying SNPs associated with methylation levels in a region, which copes with high-dimensional feature space and allows variable selection.
- **MoMotif** (<https://github.com/kaiqiong/MoMotif>)
A bioinformatics tool for a sensitive identification, at the single base-pair resolution, of complex, or subtle, alterations to core binding motifs, discerned from ChIP-seq data.

Shiny Application

- A web-based **Risk Calculator for Readmission for Dehydration following Creation of a Diverting Loop Ileostomy** (https://kaiqiong.shinyapps.io/dehydration_app/)

Last Updated on September 30, 2025