

# Kaiqiong Zhao – Curriculum Vitae

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<b>Website</b>	<a href="https://kaiqiong.github.io">https://kaiqiong.github.io</a> Google Scholar	<b>Email</b>	<a href="mailto:kaiqiong@yorku.ca">kaiqiong@yorku.ca</a> <a href="https://github.com/kaiqiong">https://github.com/kaiqiong</a>
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## Research Interests

Statistical genetics, high-dimensional statistics, statistical computing, robust optimization, data integration, causal inference, statistical machine learning

## Employment

July 2023 - **Assistant Professor**  
Department of Mathematics and Statistics, York University, Toronto, ON, Canada

Nov 2022 - **CANSSI Distinguished Postdoctoral Fellow**  
June 2023 Department of Statistical Sciences, University of Toronto, Toronto, ON, Canada

Nov 2021 - **CANSSI Distinguished Postdoctoral Fellow**  
Oct 2022 Department of Mathematical and Statistical Sciences, University of Alberta, Edmonton, AB, Canada

Mar 2018 - **Statistics Consultant (Part-time)**  
Dec 2019 Jewish General Hospital, Montréal, QC, 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

## Teaching Experience

### Course Instructor

Jan 2022 - Department of Mathematical and Statistical Sciences, University of Alberta, AB, Canada  
Apr 2022 *STAT 161: Introductory Statistics for Business and Economics*  
141 enrolled students

Jan 2020 - Department of Epidemiology, Biostatistics, and Occupational Health, McGill University, QC, Canada  
Apr 2020 *EPIB 521: Regression Analysis for Health Sciences*  
11 enrolled students

### Teaching Assistant

Sep 2017 - Department of Epidemiology, Biostatistics, and Occupational Health, McGill University  
Apr 2018 *EPIB 607: Inferential Statistics*  
*EPIB 621: Data Analysis in Health Sciences*

Sep 2013 - Department of Mathematics and Statistics, University of Windsor  
Dec 2013 *62-130-01: Elements of Calculus*

## 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

## 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/](https://kaiqiong.shinyapps.io/dehydration_app/))

## Publications

1. 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
2. \*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.  
\* co-first authorship
3. **Zhao, K.**, Oualkacha, K., Lakhali-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*.]
4. 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.
5. 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.

6. Moon, J., Monton, O., Smith, A., Garfinkle, R., **Zhao, K.**, Zekowitz, P., Loisel, 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
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. Al-Masrouri, S., Garfinkle, R., Al-Rashid, E., **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.
13. **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.
14. 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.
15. Lakhali-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.
16. 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.
17. 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 Cooperate in the Inhibition of p65 Nuclear Translocation. *mBio* (2016). PMID: 27677792.

## Talks and Seminars

### Invited Talks

Jun 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 <b>Seminar</b> Series, Montréal, QC, Virtual
Dec 2020	Bioinformatics-Biostatistics Research <b>Seminar</b> Series, University of Manitoba, Winnipeg, MB, Virtual
Dec 2020	McGill Initiative in Computational Medicine <b>Research Day</b> , 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

### Journal Review

2023      Article reviewed for *Journal of the American Statistical Association; Applications & Case Studies*  
2023      Article co-reviewed for *Bioinformatics*  
2022      Article reviewed for *Journal of the American Statistical Association; Applications & Case Studies*  
2020      Article co-reviewed for *The Annals of Applied Statistics*  
2020      Article co-reviewed for *Genetic Epidemiology*

### Community Activities & Service

July 2022      **Conference session organizer**  
*International Chinese Statistical Association (ICSA) – Canada Chapter Symposium, Banff, Alberta*  
Session: Statistical Learning Methods and Applications

July 2022      **Conference session chair**  
*International Chinese Statistical Association (ICSA) – Canada Chapter Symposium, Banff, Alberta*  
Session: Recent Advances in Statistical Genetics

Sep 2017 -  
Aug 2018      **Student representative for the Biostatistics PhD Comprehensive Exam**  
Department of Epidemiology, Biostatistics and Occupational Health, McGill University