

UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE & DENTISTRY CURRICULUM VITAE

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Date of Birth: 01/08/1982

Citizenship: USA

CURRENT POSITIONS

Associate Professor of Biostatistics & Computational Biology

University of Rochester School of Medicine & Dentistry, Rochester, NY

EDUCATION

2000 – 2004 B.S., Statistics, University of Michigan, Ann Arbor, MI

2009 – 2010 M.H.S., Bioinformatics, Johns Hopkins School of Public Health, Baltimore, MD

2005 – 2010 Ph.D., Biostatistics, Johns Hopkins School of Public Health, Baltimore, MD

POST-DEGREE TRAINING

2010 – 2013 Postdoctoral Fellowship, University of Rochester School of Medicine & Dentistry, Rochester, NY

2013 – 2014 Postdoctoral Associate, University of Rochester School of Medicine & Dentistry, Rochester, NY

FACULTY APPOINTMENTS

2014 – 2018 Assistant Professor, Department of Biostatistics & Computational Biology, University of Rochester School of Medicine & Dentistry, Rochester, NY

2014 – 2018 Assistant Professor, Department of Biomedical Genetics, University of Rochester School of Medicine & Dentistry, Rochester, NY

2019 – present Associate Professor, Department of Biostatistics & Computational Biology, University of Rochester School of Medicine & Dentistry, Rochester, NY

2019 – present Associate Professor, Department of Biomedical Genetics, University of Rochester School of Medicine & Dentistry, Rochester, NY

2015 – present Affiliated Faculty, The Goergen Institute for Data Science, University of Rochester, Rochester, NY

2017 – present Affiliated Faculty, Center for Biomedical Informatics, University of Rochester Medical Center, Rochester, NY

2018 – present Member, Environmental Health Sciences Center, University of Rochester Medical Center, Rochester, NY

HONORS AND AWARDS

2004 Honors College Concentration in Statistics with Highest Distinction, University of Michigan

2004 Phi Beta Kappa, University of Michigan

2004 – 2005 Intramural Research Training Award Fellow, NIH/NHGRI, Cancer Genetics Branch

2005 – 2007 Trainee, NIH Training Grant in the Epidemiology and Biostatistics of Aging, Johns Hopkins School of Public Health

2007 – 2010 Trainee, NIH Training Grant in Biostatistics for Genetics/Genomics,

2008	Johns Hopkins School of Public Health Travel Award, International Meeting of the Microarray and Gene Expression Data Society
2009 & 2010	Teaching Assistant Recognition Award Nominee, Johns Hopkins School of Public Health
2010	Helen Abbey Award for Excellence in Teaching, Johns Hopkins School of Public Health
2010 – 2013	Trainee, NIH Training Grant in Experimental Therapy Models, University of Rochester School of Medicine & Dentistry
2011	Conference Fellowship, q-bio Conference on Cellular Information Processing
2011	Conference Scholarship, Bioconductor Conference (BioC2011)
2015	Graduate Student Society Advocacy Award, University of Rochester School of Medicine & Dentistry

ACADEMIC & PROFESSIONAL ORGANIZATIONS

2009 – present	Member, American Statistical Association (ASA)
2009 – present	Member, The International Biometric Society, Eastern North American Region (ENAR)
2009 – present	Member, ASA Biometrics Section
2014 – present	Member, Rochester Chapter of the ASA
2015 – present	Member, ASA Section on Statistics in Genomics and Genetics
2020 – present	Member, Math Alliance

COMMITTEES & OTHER ADMINISTRATIVE SERVICE

UR Department of Biostatistics & Computational Biology

2015 – 2017	Chair, Biostatistics and Computational Biology Departmental Seminar Series
2015 – present	Member, Bioinformatics Concentration Curriculum Committee
2016 – present	Member, Statistics Graduate Admissions Committee
2016 – present	Member, Biostatistics and Computational Biology Faculty Search Committee
2018 – present	Member, Biostatistics and Computational Biology Computing Committee
2018 – present	Member, Biostatistics and Computational Biology Curriculum Committee
2019 – present	Member, Internal Advisory Board / Executive Committee for NIH T32 ES007271
2020 – present	Associate Program Director, Statistics PhD Program

UR Extra-Departmental

2015 – 2016	Co-chair, Data Science Colloquium Series
2015 – 2019	Judge, Graduate Student Society Poster Competition
2016 – 2018	Member, CTSI Informatics Education Cluster
2017, 2019 – 2021	Reviewer, University Research Awards
2019	Reviewer, SAC Incubator Awards
2019	Reviewer, UNYTE Pipeline-to-Pilot Program
2017 – 2019	Member, Center for Biomedical Informatics and Wilmot Cancer Institute Faculty Search Committee
2018 – present	Member, Biomedical Informatics Curriculum Committee
2019 – present	Member, Bioinformatics Working Group Planning Committee
2019 – present	Participant, Driving our Future: Culture, Climate and Leadership in the Sciences
2019 – present	Member, Wilmot Cancer Institute Scientific Leadership Committee
2019 – present	Co-director, Wilmot Cancer Institute Biostatistics and Bioinformatics Shared Resource
2019 – present	Co-chair, GIDS Working Group on Life Sciences and Biomedical Data Science
2021	Member, Sproull Fellowship Review Committee
2021	Member, Provost Fellowship Review Committee

Local/Regional

2018 – 2019	Member, UP-STAT Organizing Committee
2018	Member, UP-STAT Data Analytics Committee
2016, 2018, 2019	Session Chair, UP-STAT Conference
2018 – 2019	Judge, UP-STAT Conference Student Research Awards

National

2012 – 2013	Judge, ASA/NCTM Statistical Project Competition
2016 – present	Member, Patient-Centered Outcomes Research Institute (PCORI) Reviewer Community
2017 – 2019	NIH Early Career Reviewer Program
2018 – 2019	Reviewer, CTSI Novel Biostatistical and Epidemiologic Methodology pilot program
2018	Reviewer, NIH Biodata Management and Analysis (BDMA) Study Section
2018 – 2019	Member, Bioconductor Conference (BioC2019) Organizing Committee
2019	Invited Session Organizer, Symposium on Data Science & Statistics
2019 – 2020	Member, Bioconductor Conference (BioC2020) Organizing Committee

EDUCATIONAL CONTRIBUTIONS**Research Mentoring**Postdoctoral Fellows

2014 – 2015	Qingyan Lilly Xie, Ph.D.; Primary Mentor
2016 – 2017	Isar Nassiri, Ph.D.; Primary Mentor
2020 – present	Hongying Sun, Ph.D.; Primary Mentor

Graduate Students

2015 – 2019	Valeriia Sherina, Statistics Ph.D. Program; Thesis Advisor (co-advisor: Dr. Tanzy Love)
2018 – present	David Burton, Statistics Ph.D. Program; Thesis Advisor
2018 – present	Zachary Brehm, Statistics Ph.D. Program; Thesis Advisor
2020 – present	Erik Vonkaenel, Statistics Ph.D. Program; Thesis Advisor

Graduate Research Assistants

2015 – 2018	Yun Zhang, Statistics Ph.D. Program
2016 (fall)	Kejia Wang, Statistics M.A. Program
2017 (summer)	Jeremiah Jones, Statistics Ph.D. Program
2019 (summer)	Erik Vonkaenel, Statistics Ph.D. Program
2019 (fall)	Bokai Wang, Statistics Ph.D. Program
2020 (summer)	Sami Leon, Statistics Ph.D. Program

Rotation Students

2015 (fall)	Bokai Wang, Statistics Ph.D. Program
2018 (spring)	Mukta Palshikar, Biophysics, Structural & Computational Biology Ph.D. Program
2019 (spring)	Abhinav Mittal, Biophysics, Structural & Computational Biology Ph.D. Program

Undergraduate Students

2015 (summer)	Lindsey Barden, University of North Carolina at Chapel Hill
2015 (summer)	Allison Maier, State University of New York at Geneseo
2015 (summer)	Scott Onestak, University of Rochester
2015 – 2017	Lauren Kemperman, University of Rochester
2015 – 2017	Jeffrey Hrebenach, University of Rochester
2016 (summer)	Alida Mooney, State University of New York at Geneseo
2016 – 2017	Winslow Powers, University of Rochester

2016 – 2018	Jonavelle Cuervo, University of Rochester
2017 – 2019	Benjamin Hsu, University of Rochester
2018 (fall)	Oleg Demus, University of Rochester
2017 – 2019	Qidi Yang, University of Rochester
2018 – 2019	Kailey Ferger, University of Rochester
2019 (summer)	Joshua Dennis, University of Rochester
2019 (fall)	Daniel Munoz Huerta, University of Rochester
2019 – present	Yuewei Fei, University of Rochester
2019 – present	Michael Lansford, University of Rochester
2019 – present	Benyu Zhou, University of Rochester
2020 – 2021	Frank Gonzalez, University of Rochester

High School Students

2017 (summer)	Fatima Umar, Pittsford Schools
2017 (summer)	Raymond Feng, Pittsford Schools
2019 (summer)	Lillian Stolberg, Pittsford Schools

Classroom Teaching

2012	BST520, Current Topics in Bioinformatics (course co-designer and co-instructor)
2014	BST512, Advanced Bayesian Inference with an Emphasis on Computation (one lecture)
2014	BST432, Introduction to Bioinformatics (one lecture)
2014 – 2018	IND501, Ethics and Professional Integrity in Research (small group facilitator)
2015	GEN508, Genomics and Systems Biology (two lectures)
2015	GEN504, Genetics Seminar (one lecture)
2015	BST550, Genomic Data Analysis Using R/Bioconductor (course designer and instructor)
2016 – present	IND419, Introduction to Quantitative Biology (two to five lectures)
2016 – 2017	BST494/BST430, Statistical Computing (course designer and instructor)
2018 – present	BST487, Seminar in Statistical Literature (topic supervisor)
2019, 2021	BST494/BST434, Genomic Data Analysis (course designer and instructor)
2020	BST570, Statistical Analysis of Cell Mixtures (course designer and instructor)

Short Courses & Workshops

2018	Grad STEM for All Summer Program (instructor and program mentor)
2018	Genomic Data Analysis Workshop (course designer and instructor)

Thesis Committee Service

2014 – 2017	Justin Komisarof (Genetics, Development, and Stem Cells Ph.D. Program)
2016 – 2018	Yun Zhang (Statistics Ph.D. Program)
2017 – 2020	Rohith Palli (Biophysics, Structural & Computational Biology Ph.D. Program)
2017 – present	Adam Cornwell (Genetics, Development, and Stem Cells Ph.D. Program)
2017 – present	Derek Crowe (Genetics, Development, and Stem Cells Ph.D. Program)
2017	Adan Becerra (Epidemiology Ph.D. Program); <i>chair, Thesis Defense Committee</i>
2018 – 2020	Matthew Turner (Genetics, Development, and Stem Cells Ph.D. Program)
2018	Kyle Berger (Biophysics, Structural & Computational Biology Ph.D. Program); <i>chair, Thesis Defense Committee</i>
2019 – present	Jiatong Sui (Statistics Ph.D. Program)

CONSULTATIONS

2008 – 2009	University of Miami Miller School of Medicine, Miami, Florida, USA
2010 – 2011	GenomeDx Biosciences Inc, Vancouver, British Columbia, Canada

2011 – 2013	Janssen Research and Development, Beerse, Belgium
2012 – 2013	OpenAnalytics, Heist-op-den-Berg, Belgium
2013	Selventa Inc, Cambridge, Massachusetts, USA

EDITORIAL ASSIGNMENTS IN PROFESSIONAL JOURNALS

Ad hoc reviews for: Annals of Applied Statistics, APJ Renal Physiology, Bioinformatics, Biometrics, Biotechniques, biOverlay, BMC Bioinformatics, BMC Cancer, BMC Genomics, BMC Medical Genomics, Cancer Informatics, Cell Systems, Database, Epigenomics, F1000Research, Gene, Genome Biology, IEEE/ACM Transactions on Computational Biology and Bioinformatics, IMS Collections, iScience, Journal of the American Statistical Association, Journal of Postdoctoral Research, Microarrays, Nature Methods, Nucleic Acids Research, NAR Genomics and Bioinformatics, PLoS Computational Biology, PLoS Genetics, PLoS One, Proceedings of the National Academy of Sciences, Science, Scientific Reports, Statistical Applications in Genetics and Molecular Biology, Statistics in Biosciences

Editorial Assignments

2012 – 2014	Editor, Journal of Postdoctoral Research
2015 – 2020	Review Editor, Frontiers in Genetics
2018 – present	Associate Editor, Biostatistics

GRANTS & CONTRACTS

As Principal Investigator / Co-Principal Investigator

NIH R01 GM139928 (PI: McCall)

Statistical Methods for MicroRNA-seq Experiments

09/11/20-06/30/25; Total Award: \$1,975,065

The overall objective of this application is to improve the analysis of sRNA-seq data by developing statistical methods that account for challenges specific to sRNA-seq data.

NIH R00 HG006853 (PI: McCall)

Statistical Methods for Estimation of Gene Regulatory Networks

09/01/14 - 08/31/18 (NCE); Total Award: \$726,419

The overall goals of the proposed research are: to improve the estimation of gene regulatory networks from perturbation experiments, by using methods that explicitly model and incorporate uncertainty in each step of the process, and to use these estimated networks to predict cellular response to intervention.

NIH K99 HG006853 (PI: McCall)

Statistical Methods for Estimation of Gene Regulatory Networks

09/10/13 - 08/31/14; Total Award: \$79,893

Responsibilities: This Award provided support to obtain the expertise required to address the proposed research aims and transition to an independent research career through a combination of coursework, mentorship, and research experience.

UL1 TR002001 Pilot Studies Award (PI: McCall)

Development of qPCR Methodology for Clinical Testing

08/15/16 - 05/31/17; Total Award: \$35,000

The overall goals of the proposed research are: (1) to develop improved methodology to handle non-detects in qPCR data, (2) to develop a single sample version of our methodology for clinical biomarkers, and (3) to assess the applicability of our methods to microRNA transcriptome screening.

UL1 TR002001 Pilot Studies Award (PI: McCall)

Estimation of cell-type specific microRNA expression in complex tissue samples

06/01/17 - 05/31/18; Total Award: \$35,000

The overall goal of the proposed research is to develop statistical deconvolution methodology to estimate the cellular composition and cell-type specific microRNA expression of tissue samples.

UL1 TR002001 Pilot Studies Award (PI: McCall)

Statistical methods to quantify imaged microglia

06/01/19 - 05/31/20; Total Award: \$35,000

The overall goal of the proposed research is to improve the analysis of microglial morphology by developing statistical methods to quantify images of microglia.

NIH R01 HL137811 (PI: Halushka; Subcontract-PI: McCall)

Fine Dissection of Atherosclerosis Microenvironment RNA Expression

09/01/17 – 08/30/22; Annual Direct Costs to McCall Lab: \$65,866/year

This project will identify genes, long noncoding RNAs and microRNAs that are involved in the development of coronary artery atherosclerosis.

NIH R01 GM083084 (PI: Irizarry; Subcontract-PI: McCall)

Preprocessing and Analysis Tools for High-Throughput Technologies

09/01/16 - 06/30/20; Annual Direct Costs to McCall Lab: \$25,000/year

The goal of the proposed research is to leverage the public data repositories to gain insights into the stochastic nature of measurement and develop methods to model application-specific systematic bias and unwanted variability. The proposed research requires the use of a vast amount of publicly available data across several high-throughput platforms.

Other Roles

Invidumed GmbH (PI: Land)

Global Cancer Database Project

01/01/18 - 12/31/19; Percent Effort: 20%

The URMC and INDIVUMED bioinformatics collaboration will focus on the development of a multi-dimensional analytics platform (Portal Solution) linked to a global biospecimen and clinical data resource controlled for molecular integrity, comprehensive data annotation and diversity of patient population. The Global Cancer Data Base Solution (GCDS) will result from the convergence of the Portal Solution and a global biospecimen resource, allowing for an investigator, regardless of their analytical bias (e.g. genomics, proteomics, metabolomics, immune-profiling, etc.) to interrogate research hypothesis. The GCDS, when developed should represent the most comprehensive analytical tool to interpret and utilize cancer phenomic data linked to a dynamic and growing pool of molecular and phenomic data curated from patients on a global scale.

NIH R35 CA197562 (PI: Land)

Mediators of Cancer Cell Homeostasis: Intervention Targets Common to Diverse Types of Cancer

09/01/15 - 08/31/22; Percent Effort: 10%

The goals of this research program are to develop a rational path towards cancer interventions independent of the tumors' mutational status and with lower rates of associated disease recurrence that can be delivered to a large fraction of patients.

NIH HHSN272201200005C (PI: Topham)

NIAID Respiratory Pathogens Research Center (RPRC) at the University of Rochester

12/13/11 – 12/12/18; Percent Effort: 10%

This center's purpose is to establish, direct, and maintain the UR-RPRC, a multidisciplinary, collaborative, integrated, and iterative program focused on the conduct of research activities to understand the etiology and impact of respiratory pathogens and to develop and evaluate strategies for their control, treatment and

prevention. Specifically, we will provide and maintain a multidisciplinary team of experienced investigators and technical staff with expertise in clinical research and laboratory methods, and experience working with respiratory pathogens and the diseases they cause.

NIH R01 HL127891 (PI: Brookes)

The Role of the Mitochondrial UPR in Ischemic Protection

06/01/15 – 02/28/19; Percent Effort: 5%

This proposal aims to identify mechanisms through which the UPRmt protects *C. elegans* and to translate these findings to a mammalian cardiac model. Our approach will include defining mechanistic crosstalk with other signaling pathways that are also protective and will result in the identification of functional orthologs that perform similarly in mammals as ATFS-1 and HAF-1.

NIH U54 CA228110 (PI: Rahman)

WNY Center for Research on Flavored Tobacco Products

09/01/2018 – 06/30/2023; Percent Effort: 5%

We propose a Center for Research on Flavored Tobacco Products (CRoFT), the goal of which is to develop a novel framework and approaches for assessing the impact of tobacco product flavors and flavorings on consumer behavior, exposures, and health.

NIH P30 ES001247 (PI: Lawrence)

Environmental Agents as Modulators of Disease Processes

04/01/2019 – 03/31/2021; Percent Effort: 5%

The mission of the EHSC at Rochester is to improve public health through the generation of fundamental knowledge and elaboration of mechanisms by which chemical exposures, alone or through interaction with other modifying factors, contribute to cumulative health risk across the lifespan.

NIH R01 NS114480 (PI: Majewska)

Mechanisms that regulate microglial dynamics in the context of plasticity

01/01/2020 – 12/31/2024; Percent Effort: 5%

The goals of this research program are to investigate microglial mechanisms that govern changes in neuronal networks. This will yield information with broad implications for understanding and treating a large spectrum of human neurological disorders.

NIH T32 ES007271 (PI: Thurston)

Training in Environmental Health Biostatistics

09/30/15 – 06/30/20

I am a research mentor on this training grant; no salary support.

PRESENTATIONS

National & International Conferences

May 2005	A Novel Algorithm for Microarray Time Series Data Analysis IEEE International Workshop on Genomic Signal Processing and Statistics, Newport, RI
Sept 2008	An Improved Gene Expression Barcode based on a Hierarchical Mixture Model International Meeting of MGED, Riva del Garda, Italy
July 2009	From a Single CEL File to a Gene Expression Barcode Bioconductor Conference (BioC2009), Seattle, WA
Mar 2010	Gene Expression Barcodes ENAR Spring Meeting, New Orleans, LA
July 2011	Thawing Frozen Robust Multi-array Analysis (fRMA) Bioconductor Conference (BioC2011), Seattle, WA

Aug 2011	Assessing Microarray Quality Joint Statistical Meeting, Miami Beach, FL
Aug 2011	A Computational Bayesian Approach for the Inference of Boolean Networks Q-Bio Conference in Cellular Information Processing, Santa Fe, NM
July 2012	Batch effect reduction using the frma package Bioconductor Conference (BioC2012), Seattle, WA
Aug 2013	Addressing Within-Subject Genomic Heterogeneity Joint Statistical Meeting, Montreal, Canada
Feb 2015	A Gene Regulatory Network of Cooperation Response Genes Governs the Cancer Phenotype Winter q-bio Meeting, Maui, HI
June 2015	Estimation of a Regulatory Network of Cooperation Response Genes in a Model of Cancer Malignancy, Statistical Learning of Biological Systems from Perturbations, Ascona, Switzerland
May 2016	Estimation of a Regulatory Network of Cooperation Response Genes in a Model of Cancer Malignancy, Great Lakes Bioinformatics Conference, Toronto, Canada
July 2016	Complex Sources of Variation in Tissue Expression Data: Analysis of the Genotype-Tissue Expression (GTEx) Lung Transcriptome, GTEx Project Community Meeting, Stanford, CA

Invited Presentations: Local

Apr 2008	Cross-platform comparisons using microarray spike-in data The Expressionist Seminar Series, Baltimore, MD
Oct 2009	Barcodes for Beginners The Expressionist Seminar Series, Baltimore, MD
Mar 2011	What can I do with a single microarray? Transcriptomics and Integrated Genomics Meeting, Rochester, NY
May 2012	Harnessing heterogeneity to improve genomic biomarkers Transcriptomics and Integrated Genomics Meeting, Rochester, NY
Sept 2012	Batch effects in genomic data Transcriptomics and Integrated Genomics Meeting, Rochester, NY
Dec 2013	Gene Regulatory Network Estimation Transcriptomics and Integrated Genomics Meeting, Rochester, NY
Sept 2014	On Non-Detects in qPCR Data Transcriptomics and Integrated Genomics Meeting, Rochester, NY
Mar 2015	Overview of McCall Group Research Transcriptomics and Integrated Genomics Meeting, Rochester, NY
Apr 2015	Incorporating Uncertainty in the Estimation of Gene Regulatory Networks Center for Integrated Research Computing Symposium Series, Rochester, NY
Apr 2015	Challenges in Translational Genomics Workshop sponsored by the Graduate Student Society, Rochester, NY
Dec 2015	Mechanics of RNA-Seq Data Analysis Using R Workshop sponsored by the Center for Professional Development, Rochester, NY
Oct 2016	Sources of Variation in GTEx Lung Tissue Expression Data Lung Biology Research Seminar Series, Rochester, NY
Jan 2017	Incorporating Uncertainty in the Estimation of Gene Regulatory Networks Bioinformatics Cluster, Rochester, NY
Mar 2017	Sources and Effects of Transcriptomic Heterogeneity Center for Biomedical Informatics, Rochester, NY
Dec 2017	What can we learn from co-expression analyses? Transcriptomics and Integrated Genomics Meeting, Rochester, NY
Feb 2019	Co-expression analysis of complex tissues PhD Applicant Weekend, Rochester, NY

Oct 2020 Co-expression, Deconvolution, and MicroRNAs
CTSI Seminar Series, Rochester, NY

Invited Presentations: National & International

Sept 2008 EMERALD Workshop on Array Quality Assessment Methods
International Meeting of MGED, Riva del Garda, Italy

Feb 2011 Frozen Robust Multi-array Analysis (fRMA)
La Caestienne Meeting, Nismes, Belgium

Oct 2011 Microarray Preprocessing and Quality Control
La Caestienne Meeting, Nismes, Belgium

Oct 2011 MicroRNA Microarray Performance
Janssen Research and Development, Beerse, Belgium

Apr 2012 Batch Effects and Splice Variants
La Caestienne Meeting, Nismes, Belgium

Aug 2012 Summarization of Affymetrix GeneChip Probe Level Data: from RMA to fRMA
International Biometric Conference, Kobe, Japan

Oct 2012 fRMA for Exon / Gene ST Arrays
La Caestienne Meeting, Nismes, Belgium

July 2013 A Computational Bayesian Approach to Gene Regulatory Network Estimation
Bioconductor Conference (BioC2013), Seattle, WA

June 2015 Modeling qPCR Non-Detects as Missing Data
qPCR and Digital PCR Congress: USA, San Diego, CA

Dec 2016 Incorporating Uncertainty in the Estimation of Gene Regulatory Networks
University of Buffalo Biostatistics Seminar Series, Buffalo, NY

Aug 2017 It's all about the residuals: estimating gene networks by leveraging residual structure in multi-tissue transcriptomic data
Joint Statistical Meeting, Baltimore, MD

Mar 2018 How Amazing Mentors Think About Mentoring
Webinar organized by the Center for the Integration of Research, Teaching and Learning

May 2019 Case Studies in Interoperability: From Generic Classes To Specific Functions
Symposium on Data Science & Statistics, Bellevue, WA

Aug 2020 Co-Expression Analysis of Complex Tissues
Joint Statistical Meeting, Virtual Conference

Sept 2020 Quantifying Uncertainty in the Estimation of Gene Regulatory Networks
University of Pennsylvania Biostatistics Seminar Series, Virtual Seminar

Oct 2020 Quantifying Uncertainty in the Estimation of Gene Regulatory Networks
Roswell Park Cancer Genetics and Genomics Webinar Series

PUBLICATIONS

** denotes trainee / supervisee; ° denotes senior statistician; † denotes corresponding author(s)*

Pre-prints

1. **Kemperman L*** and **McCall MN^{†°}** (2017). *miRcomp-Shiny*: Interactive assessment of qPCR-based microRNA quantification and quality control algorithms. F1000Research. 6:2046.
2. **Sherina V***, **McCall MN**, Love TMT^{†°} (2019). Fully Bayesian imputation model for non-random missing data in qPCR. arXiv:1910.13936.
3. Mendes MS, Atlas J, **Brehm Z***, Ladron-de-Guevara A, **McCall MN°**, Majewska AK[†] (2020). In vivo imaging of the kinetics of microglial self-renewal and maturation in the adult visual cortex. bioRxiv. doi: <https://doi.org/10.1101/2020.03.05.977553>
4. McMurray HR, Ambeskovic A, Newman LA, Aldersley J, Balakrishnan V, Smith B, Stern HA,

Land H[†], **McCall MN**^{†°} (2020). Gene network modeling via TopNet reveals robust epistatic interactions between functionally diverse tumor critical mediator genes. *bioRxiv*.

doi: <https://doi.org/10.1101/2020.10.07.328542>

5. **McCall MN**, Chu C, Wang L, Benoodt L, Thakar J, Corbett A, Holden-Wiltse J, Slaunwhite C, Grier A, Gill S, Falsey AR, Topham DJ, Caserta M, Walsh E, Qiu X^{†°}, Mariani TJ[†] (2020). A systems genomics approach uncovers molecular associates of RSV severity. *bioRxiv*.
doi: <https://doi.org/10.1101/2020.12.18.423266>

Peer-Reviewed Journal Articles

1. Wang L, Chu CY, **McCall MN**, Slaunwhite C, Holden-Wiltse J, Corbett A, Falsey AR, Topham DJ, Caserta MT, Mariani TJ, Walsh EE, and Qiu X (2021). Airway Gene-Expression Classifiers for Respiratory Syncytial Virus (RSV) Disease Severity in Infants. *BMC Medical Genomics*, 14(57).
<https://doi.org/10.1186/s12920-021-00913-2>
2. Lim Y, Berry B, Viteri S, **McCall MN**[°], Park EC, Rongo C, Brookes PS, Nehrke K[†] (2021). FNDC-1-Mediated Mitophagy and ATFS-1 Coordinate to Protect Against Hypoxia-Reoxygenation. *Autophagy*, doi: 10.1080/15548627.2021.1872885
3. **Zhang Y**^{*}, **Cuerdo J**^{*}, Halushka MK, **McCall MN**^{†°} (2021). The effect of tissue composition on gene co-expression. *Briefings in Bioinformatics*, 22(1):127-139.
4. Fomchenko KM, Verma RX, Kannan S, Lin BL, Yang X, Nieuwenhuis TO, Patil AH, Fox-Talbot K, **McCall MN**[°], Kwon C, Kass DA, Rosenberg AZ, Halushka MK[†] (2020). Proteogenomic single cell analysis of skeletal muscle myocytes. *Journal of Proteome Research*.
5. **Hsu B**^{*}, **Sherina V**^{*}, **McCall MN**^{†°} (2020). Autoregressive modeling and diagnostics for qPCR amplification. *Bioinformatics*, doi: <https://doi.org/10.1093/bioinformatics/btaa1000>
6. **Sherina V**^{*}, McMurray HR, **Powers W**^{*}, Land H, Love TMT, and **McCall MN**^{†°} (2020). Multiple imputation and direct estimation for qPCR data with non-detects. *BMC Bioinformatics*, 21:545. [ENAR Distinguished Student Paper Award to V. Sherina]
7. Lowery RL, Latchney SE, Peer RP, Lamantia CE, Opanashuk L, **McCall MN**[°], and Majewska AK[†] (2020). Acute 2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin exposure in adult mice does not alter the morphology or inflammatory response of cortical microglia. *Neuroscience Letters*, 135516.
8. Chu CY, Qiu X, **McCall MN**, Wang L, Corbett A, Holden-Wiltse J, Slaunwhite C, Grier A, Gill SR, Pryhuber GS, Falsey AR, Topham DJ, Caserta MT, Walsh EE, Mariani TJ (2020). Airway gene expression correlates of RSV disease severity and microbiome composition in infants. *The Journal of Infectious Diseases*, jiaa576, doi: <https://doi.org/10.1093/infdis/jiaa576>
9. Nieuwenhuis TO, Yang S, Verma RX, Pillalamarri V, Arking D, Rosenberg AZ, **McCall MN**[°], Halushka MK[†] (2020). Consistent RNA sequencing contamination in GTEx and other data sets. *Nat Communications*, 11:1933.
10. Wang YT, Lim Y, **McCall MN**[°], Huang KT, Haynes CM, Nehrke KW, Brookes PS[†] (2019). Cardioprotection by the mitochondrial unfolded protein response requires ATF5. *American Journal of Physiology-Heart and Circulatory Physiology*, 317(2):H472-H478.
11. Walsh EE[†], Mariani TJ, Chu C, Grier A, Gill SR, Qiu X, Wang L, Jeanne HW, Corbett A, Thakar J, Benoodt L, **McCall MN**, Topham DJ, Falsey AR, Caserta MT (2019). Aims, study design and enrollment results from the Assessing Predictors of Infant Respiratory Syncytial Virus Effects and Severity (AsPIRES) study. *JMIR Research Protocols*, 8(6):e12907.
12. Spinelli P, Latchney SE, Reed JM, Fields A, Baier BS, **Lu X**^{*}, **McCall MN**[°], Murphy SP, Mak W, Susiarjo M[†] (2018). Identification of the novel Ido1 imprinted locus and its potential epigenetic role in pregnancy loss. *Human Molecular Genetics*, 28(4):662-674.
13. **Nassiri I**^{*} and **McCall MN**^{†°} (2018). Systematic exploration of cell morphological phenotypes associated with a transcriptomic query. *Nucleic Acids Research*, 46(19):e116.

14. Rosenberg AZ, Wright C, Fox-Talbot K, Rajpurohit A, Williams C, Porter C, Kovbasnjuk O, **McCall MN^o**, Shin JH, Halushka MK[†] (2018). xMD-miRNA-seq to generate near in vivo miRNA expression estimates in colon epithelial cells. *Scientific Reports*, 8(1):9783.
15. Hill MA, Alexander WB, Guo B, Kato Y, Patra KC, O'Dell MR, **McCall MN^o**, Whitney-Miller CL, Bardeesy N, and Hezel AF[†] (2018). Kras and Tp53 mutations cause cholangiocyte- and hepatocyte-derived cholangiocarcinoma. *Cancer Research*, 78(16):4445-4451.
16. Halushka MK[†], Fromm B, Peterson KJ, **McCall MN^o** (2018). Big Strides in Cellular MicroRNA Expression. *Trends in Genetics*, 34(3):165-167.
17. **McCall MN^o**, Kim MS, Adil M, Patil AH, Lu Y, Mitchell CJ, Leal-Rojas P, Xu J, Kumar M, Dawson VL, Dawson TM, Baras AS, Rosenberg AZ, Arking DE, Burns KH, Pandey A, Halushka MK[†] (2017). Toward the human cellular microRNAome. *Genome Research*, 27(10):1769-1781.
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Peer-Reviewed R/Bioconductor Software Packages

1. frma: Single microarray preprocessing and analysis
2. frmaTools: Extension and customization of the frma package
3. miRcomp: Tools to assess and compare miRNA expression estimation methods
4. nondetects: Methods to model and impute non-detects in qPCR data
5. spkTools: Methods for microarray spike-in data
6. ternarynet: Computational Bayesian approach to ternary network estimation

Peer-Reviewed R/Bioconductor Data Packages

1. microRNAome: This package provides a SummarizedExperiment object of read counts for microRNAs across tissues, cell-types, and cancer cell-lines.

2. miRcompData: Raw amplification data from a large microRNA mixture / dilution study. These data are used by the miRcomp package to assess the performance of methods that estimate expression from the amplification curves.
- 3-12. <platform>frmavecs: data packages containing the frozen parameter vectors used by the frm package for 10 different microarray platforms.