Hannah Waddel

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CONTACT

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EDUCATION

Emory University, Atlanta, GA — 2025

- Ph.D. Biostatistics
- Advisors: Dr. Max Lau, Dr. Lance Waller
- Dissertation Title: "Scalable and Robust Bayesian Methods for Joint Inference of Pathogen Evolution and Transmission in Outbreaks"

Emory University, Atlanta, GA — 2021

- M.S. Biostatistics

University of Utah, Salt Lake City, UT — 2018

- B.S. Mathematics, *Summa Cum Laude*

PROFESSIONAL EXPERIENCE

University of Georgia, Department of Infectious Diseases — 2025-Present
Postdoctoral Associate
Athens, GA

- Research Mentor: Dr. Justin Bahl
- Leading and contributing to research projects and publications which develop models for computational epidemiology, molecular epidemiology, and phylogenetics.
- Work done within the Center for Applied Pathogen Epidemiology and Outbreak Control

Sanofi Vaccines Division — Summer 2023
Biostatistics Intern
Swiftwater, PA (remote)

- Analyzed phase II vaccine clinical trial data from over 7,000 patients across 6 trials to assess the impact of the trial protocols' inclusion criteria and follow-up times
- Completed trainings in international clinical research standards and good clinical practice

Emory University, Biostatistics Collaboration Core — 2019-2024
Research Assistant (part-time)
Atlanta, GA

- Consulted and collaborated with researchers across the schools of medicine and public health with project roles spanning all stages of research and manuscript preparation.
- Collaborated on study design, statistical analysis, technical writing, data visualization, and/or high-performance computing cluster support on 17 research projects, resulting in coauthorship for 6 manuscripts (4 published, 2 submitted and under review).

Willis Towers Watson — Summer 2016
Actuarial Intern
Denver, CO

- Evaluated pension mortality assumptions for an international company with over 14,000 employees in their pension plan

RESEARCH EXPERIENCE

Emory University, Department of Biostatistics and Bioinformatics; Emory University, Department of Biology
PIs: Max Lau, Ph.D., Katia Koelle, Ph.D., Anice Lowen, Ph.D.

- Project title: "Dissecting the evolutionary dynamics of influenza A virus within and between naturally infected swine"

- Developed joint phylodynamic epidemiological-evolutionary model to integrate disease testing data and pathogen genetic sequencing data and infer transmission dynamics of multiple circulating pathogen variants
- Implemented large-scale yet efficient C++ algorithm to fit Bayesian stochastic model to sampled data and perform high-dimensional data imputation to reconstruct disease outbreaks
- Designed and performed simulation studies to validate and test the proposed model
- Developed and unit-tested R package to distribute method, along with functions for summarization, visualization, and remote HPC cluster interaction (over 20,000 lines of C++, R, and shell code)
- Generalized within-host immunological model of viral proliferation and clearance to perform best-fit model selection via a reversible-jump MCMC algorithm
- Work funded through the Emory Molecules and Pathogens to Populations and Pandemics (MP3) initiative

Publications

Articles

1. **Waddel, H. B.**, Koelle, K. V., Lau, M. S. Y. ScITree: Scalable Bayesian inference of transmission tree from epidemiological and genomic data. *PLOS Computational Biology*, 21(6): e1012657. DOI: 10.1371/journal.pcbi.1012657
2. Dorbu, A. D., **Waddel, H. B.**, Chadha, M., López de Romaña, D., Arabi, M., Moore, R. H., Mehta, C., & Pachón, H. (2025). Nutritional Anemia Reductions Due to Food Fortification Among Women of Childbearing Age: A Literature Review and Bayesian Meta-Analysis. *Maternal & Child Nutrition*, e13801. DOI: 10.1111/mcn.13801
3. Moubadder, L., Bliss, M., Maliniak, M., **Waddel, H. B.**, Switchenko, J., Chang, H., Kramer, M., & McCullough, L. (2024). Increasing Access, Equitability, and Rigor in the Assessment of Neighborhood Mortgage Discrimination. *Journal of Urban Health* 101(6), 1274–1278. DOI: 10.1007/s11524-024-00941-0
4. Sadan, O., **Waddel, H. B.**, Moore, R., Feng, C., Mei, Y., Pearce, D., Kraft, J., Pimentel, C., Mathew, S., Akbik, F., Ameli, P., Taylor, A., Danyluk, L., Martin, K. S., Garner, K., Kolenda, J., Pujari, A., Asbury, W., Jaja, B. N. R., Macdonald, R. L., Cawley, C. M., Barrow, D. L., & Samuels, O. (2022). Does intrathecal nicardipine for cerebral vasospasm following subarachnoid hemorrhage correlate with reduced delayed cerebral ischemia? A retrospective propensity score–based analysis. *Journal of Neurosurgery*, 136(1), 115-124. DOI: 10.3171/2020.12.JNS203673
5. Akbik, F., **Waddel, H. B.**, Jaja, B. N. R., Macdonald, R. L., Moore, R., Samuels, O. B., & Sadan, O. (2021). Nicardipine Prolonged Release Implants for Prevention of Delayed Cerebral Ischemia after Aneurysmal Subarachnoid Hemorrhage: A Meta-Analysis. *Journal of Stroke and Cerebrovascular Diseases*, 30(10), 106020. DOI: 10.1016/j.jstrokecerebrovasdis.2021.106020
6. Nadel, B. B., Lopez, D., Montoya, D. J., Ma, F., **Waddel, H. B.**, Khan, M. M., Mangul, S., & Pellegrini, M. (2021). The Gene Expression Deconvolution Interactive Tool (GEDIT): accurate cell type quantification from gene expression data. *GigaScience*, 10(2) DOI: 10.1093/gigascience/giab002

Under Review

1. Howard, M., Wilmot, G., Jorgensen, C., Cahn, S., **Waddel, H. B.**, Ali, N., Pagano, J., & Rosen. Development and Evaluation of a Novel Reproductive Educational Tool for Patients with Spinocerebellar Ataxia. *Under review.*
2. Quillin, A. L., **Waddel, H. B.**, Druss, J., & Laney, D. A. Optimizing detection of early gastrointestinal symptoms in young children with Fabry disease. *Under review.*

Conference Participation

1. **Waddel, H. B.**, Koelle, K. V., Lau, M. S. Y., "Scalable and robust mechanistic integration of epidemiological and genomic data for phylodynamic inference", Oral Presentation, *Epidemics9*, Bologna, Italy, 2023
2. **Waddel, H. B.**, Adler, F.A., "The Community Ecology of the Music Canon", Poster, *National Conference on Undergraduate Research*, Edmond, OK, USA, 2018
3. **Waddel, H. B.**, Adler, F.A., "The Community Ecology of the Music Canon", Poster, *Utah Conference on Undergraduate Research*, Cedar City, UT, USA, 2018

Honors and Awards

First Place, Senior PhD Student Presentation Day 2023
Emory University Department of Biostatistics and Bioinformatics

Scholarship 2022
Summer Institute in Statistics and Modeling in Infectious Disease, U. of Washington

Gibson Senior Award 2018
Department of Mathematics, University of Utah

Emeritus Librarian Scholarship 2017
J. Willard Marriott Library, University of Utah

Pi Mu Epsilon Mathematics Honor Society 2017
Department of Mathematics, University of Utah

National Merit Scholarship 2013

Grants and Fellowships

Laney Graduate Fellowship 2018
Laney Graduate School, Emory University

Independent Research Experience Undergraduate Grant ($1,000) 2018
Department of Mathematics and Department of Biology, University of Utah
Title: "The Community Ecology of the Music Canon"

Independent Research Experience Undergraduate Grant ($2,000) 2017
Department of Mathematics and Department of Biology, University of Utah
Title: "The Community Ecology of the Music Canon"

ORCA Undergraduate Student Mentoring Grant ($1,500) 2016
Office of Research and Creative Activities, Brigham Young University
Title: "Transcription Factor Interactions in Developing Hair Cells"

ORCA Undergraduate Student Mentoring Grant ($1,500) 2015
Office of Research and Creative Activities, Brigham Young University
Title: "Sensory Integration in Zebrafish Larvae"

Teaching

Instructor

- Co-Instructor, Intro to Epidemiology and Biostatistics (HGC 707) Fall 2022
- SPSS Short Course (Part of HGC 740C) Summer 2022, 2023, 2024
- Statistical Methods I Lab (BIOS 500L) Fall 2020

Teaching Assistant

- Statistical Practice I (BIOS 580) Fall 2022, Fall 2023
- Biostatistical Methods II (BIOS 591P) Spring 2020-Spring 2024
- Statistical Methods I Lab (BIOS 500L) Fall 2019

Guest Lectures

- "Clean Code to Deal with Dirty Data", Statistical Practice I (BIOS 580), 2024
- "Introduction to the Command Line and the HPC Cluster", Doctoral Seminar in Epidemiologic Practice (EPI 790R), 2024

Service

Georgia Statistics Day 2024
Student volunteer coordinator

Journal of the Royal Society Interface 2023
Ad-Hoc Reviewer

National Institute of Statistical Sciences, New Researchers Network 2020-Present
Executive Committee

- Founding member of the NISS New Researchers Network with a mission to support graduate students and early-career statisticians at NISS-affiliated academic departments
- Planned and hosted quarterly events to support network's mission including webinars, career fairs, panels, and networking socials

National Institute of Statistical Sciences (NISS) Graduate Student Research Conference
2021-2024
Conference organizing committee

Computer Museum of America 2021-2023
Archives Volunteer
- Organized, described, and catalogued textual materials related to the museum's hardware and software collections

Department of Biostatistics and Bioinformatics, Emory University 2019-2022
Student Council Representative

COVID-19 Geospatial support 2020
Georgia Department of Public Health

Affiliations

American Statistical Association (ASA)

International Biometric Society (IBS), Eastern North American Region (ENAR)

Association for Computing Machinery (ACM)

Other

Society of Actuaries Exam P (Probability) 2016