Athena Chen

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Summary

PhD candidate in biostatistics developing methods for analyzing proteomic and genomic data to better understand, diagnose, and treat disease. Data scientist experienced in R, Bayesian analyses, immunology, and working with high-throughput biological data.

Education

Johns Hopkins Bloomberg School of Public Health

Baltimore, MD

PhD, Biostatistics | GPA: 3.74/4.00 — *August 2017 – PRESENT*

- Advisor: Ingo Ruczinski, PhD
- Relevant coursework: Bayesian Methods, Advanced Data Science, Introductory Molecular Immunology, Statistical Machine Learning

Johns Hopkins University

Baltimore, MD

Bachelor of Arts, Biophysics and Applied Mathematics and Statistics | GPA: 3.92/4.00 — *August 2014 – May 2017*

- Thesis advisor: Margaret Johnson, PhD
- Honors thesis: *Evaluation and Application of Spatial Cell Modeling Methodologies*
- Graduated with general and departmental honors

Professional Experience

ConfluenceStat, LLC

Consultant — *August 2020*

- Constructed a model for a Bayesian adaptive clinical trial with negative binomial outcome.
- Estimated power of the clinical trial given various effect sizes and efficacy/non-inferiority cutoffs.

Research Experience

Graduate Research Assistant

Baltimore, MD

Johns Hopkins Bloomberg School of Public Health | PI: Ingo Ruczinski, PhD — *August 2017 - PRESENT*

- Developed a classifier for identifying recent HIV infections, improving the accuracy of cross-sectional estimates of incidence.
- Characterize human immune responses to various antigns derived from bacteriophage in the gut microbiome and human viruses.
- Construct a Bayesian model for proteomics data to identify enriched antibody responses. This model has been applied to data from HIV-infected individuals and COVID patients.

Undergraduate Research Assistant

Baltimore, MD

Johns Hopkins University, Department of Biophysics | PI: Margaret Johnson, PhD — *December 2015 - August 2017*

- Analyzed and assessed challenges facing current single-particle modeling methods of biochemical systems.
- Studied spatial and stochastic effects on protein dynamics.
- Mentored a student in the Biophysics Research for Baltimore Teens program.

Skills

Computing R, Git, Github, LaTeX, Python, MATLAB, JAGS, Stan, Microsoft Office, Java, Mathematica, Pymol

Languages *Native*: English

Intermediate: Spanish

Conversational: Mandarin Chinese

Software

`beer`: Bayesian Enrichment in R (`R` package)

athchen/beer

- `R` package for quantifying antibody responses from phage-immunoprecipitation sequencing data.
- Implements BEER and edgeR for identifying enriched antibody responses.
- BEER is more sensitive for detecting peptides with smaller fold-changes but takes considerably longer than edgeR.
- Submission to Bioconductor in progress.

`PhIPData` (`R` package)

♪ Bioconductor | athchen/PhIPData

- `R` package for organizing data from phage-immunoprecipitation sequencing (PhIP-seq) experiments.
- Includes specialized methods to subset and identify negative control samples, filter by viral species, and use existing libraries to populate object parameters.

Publications

Journal Articles (peer reviewed)

1. **Chen**, **A.**, Laeyendecker, O., Eshleman, S. H., Monaco, D. R., Kammers, K., Larman, H. B. & Ruczinski, I. **A top scoring pairs classifier for recent HIV infections.** *Statistics in Medicine.* doi: `10.1002/sim.8920` (Mar. 2021).

2. Johnson, M. E., **Chen**, **A.**, Faeder, J. R., Henning, P., Moraru, I. I., Meier-Schellersheim, M., Murphy, R. F., Prustel, T., Theriot, J. A. & Uhrmacher, A. M. **Quantifying the roles of space and stochasticity in computer simulations for cell biology and cellular biochemistry.** *Molecular Biology of the Cell* **32.** PMID: 33237849, 186–210. doi: `10.1091/mbc.E20-08-0530` (Jan. 2021).

3. Kammers, K., **Chen**, **A.**, Monaco, D. R., Hudelson, S. E., Grant-McAuley, W., Moore, R. D., Alter, G., Deeks, S. G., Morrison, C. S., Eller, L. A., Blankson, J. N., Laeyendecker, O., Ruczinski, I., Eshleman, S. H. & Larman, H. B. **HIV Antibody Profiles in HIV Controllers and Persons With Treatment-Induced Viral Suppression.** *Frontiers in Immunology* **12,** 3459. doi: `10.3389/fimmu.2021.740395` (Aug. 2021).

4. Peng, R., **Chen**, **A.**, Bridgeford, E., Leek, J. T. & Hicks, S. C. **Diagnosing Data Analytic Problems in the Classroom.** *Journal of Statistics and Data Science Education.* doi: `10.1080/26939169.2021.1971586` (Aug. 2021).

5. R., M. W., Henson, S. N., Monaco, D. R., **Chen**, **A.**, Littlefield, K., Bloch, E. M., Fujimura, E., Ruczinski, I., Crowley, A. R., Harini, N., Butler, S. E., Weiner, J. A., Li, M. Z., Bonny, T. S., Benner, S. E., Balagopal, A., Sullivan, D., Shoham, S., Quinn, T. C., Eshleman, S., Casadevall, A., Redd, A. D., Laeyendecker, O., Ackerman, M. E., Andrew, P., Elledge, S. J., Robinson, M. L., Tobian, A. A. R. & Larman, H. B. **Antibody responses to endemic coronaviruses modulate COVID-19 convalescent plasma functionality.** *The Journal of Clinical Investigation.* doi: `10.1172/JCI146927` (Feb. 2021).

6. Eshleman, S. H., Laeyendecker, O., Kammers, K., **Chen**, **A.**, Sivay, M. V., Kottapalli, S., Sie, B. M., Yuan, T., Monaco, D. R., Mohan, D., Wansley, D., Kula, T., Morrison, C., Elledge, S. J., Brookmeyer, R., Ruczinski, I. & Larman, H. B. **Comprehensive profiling of HIV antibody evolution.** *Cell Reports* **27,** 1422–1433. doi: `10.1016/j.celrep.2019.03.097` (Apr. 2019).

Preprints (not peer reviewed)

* indicates equal contributions

7. Angkeow, J. W. *, Monaco, D. R. *, **Chen**, **A.** *, Venkataraman, T., Jayaraman, S., Valencia, C., Sie, B. M., Liechti, T., Farhadi, P. N., Funez-dePagnier, G., Sherman-Baust, C. A., Wong, M. Q., Sears, C. L., Simner, P. J., Round, J. L., Duggal, P., Laserson, U., Steiner, T. S., Sen, R., Lloyd, T. E., Roederer, M., Mammen, A. L., Longman, R. S., Rider, L. G. & Larman, H. B. **Prevalence, persistence, and genetics of antibody responses to protein toxins and virulence factors.** *bioRxiv.* doi: `10.1101/2021.10.01.462481` (2021).

In Preparation

8. **Chen**, **A.**, Kammers, K., Larman, H. B., Scharpf, R. B. & Ruczinski, I. **Detecting Enriched Antibody Peptides in Phage-Immunoprecipitation Sequencing Data.** *For submission to Genome Biology.*

9. **Chen**, **A.**, Kammers, K., Larman, H. B., Scharpf, R. B. & Ruczinski, I. **Quantifying enriched antibody responses in PhIP-Seq data with `beer`.** *For submission to Bioinformatics.*

Posters and Presentations

Mar 2021	**Antibody Profiling Identifies Antibody Targets Associated with Natural HIV Control** Conference on Retroviruses and Opportunistic Infections | Science Spotlight Presentation	*Virtual*
April 2020	**Top Scoring Pairs Classifier for Identifying Recent HIV Infection** Johns Hopkins Biostatistics Seminar | Lightning Talk	*Baltimore, MD*
Mar 2020	**Improving Classification for Recent HIV Infection Using Top Scoring Pairs** Conference on Retroviruses and Opportunistic Infections | Poster	*Boston, MA*
Nov 2016	**Spatial Cell Modeling: Application and Evaluation of Methodologies** Lectures in Computational Biophysics at Johns Hopkins University | Invited Talk	*Baltimore, MD*

Honors & Awards

2021	**The Margaret Merrell Award**, Johns Hopkins Department of Biostatistics
	New Investigator Scholarship, Conference on Retroviruses and Opportunistic Infections
2020	**The June B. Culley Award**, Johns Hopkins Department of Biostatistics
	The Jane and Steve Dykacz Award, Johns Hopkins Department of Biostatistics
	New Investigator Scholarship, Conference on Retroviruses and Opportunistic Infections
2018	**Wolfe Street Competition**, Maryland Genetics, Epidemiology, and Medicine (MD-GEM) Training Program and Burroughs-Wellcome Fund
2017	**Phi Beta Kappa**, Johns Hopkins University
	Hartline Research Award in Biophysics, Johns Hopkins University Department of Biophysics
	Naddor Prize, Johns Hopkins University Department of Applied Math and Statistics
2015–2016	**Michael S. Applestein Scholarship**, Johns Hopkins University
	Aronson Family Scholarship, Johns Hopkins University
2014–2017	**Dean's List**, Johns Hopkins University

Teaching

Guest Lecturer

Fall 2019	**Advanced Data Science**, *Evaluating Data Analyses with Examples* taught by Stephanie Hicks, PhD and Roger Peng, PhD

Graduate Teaching Assistant

- Guided students through lab exercises and discussions of course material.
- Provided feedback on assignments to facilitate a better understanding of course concepts.

Fall 2021	**Statistical Methods in Public Health II**, *taught by Marie Diener-West, PhD and Karen Bandeen-Roche, PhD*
Fall 2021	**Statistical Computing**, *taught by Stephanie Hicks, PhD*
Spring 2021	**Bayesian Methods I and II**, *taught by Gary Rosner, PhD and Robert Scharpf, PhD*
Fall 2019/2020	**Advanced Data Science**, *taught by Jeff Leek, PhD; Stephanie Hicks, PhD; and Roger Peng, PhD*
Summer 2020	**Data Wrangling with R**, *taught by Andrew Jaffe, PhD and John Muschelli, PhD*
	Introduction to R for Public Health Researchers, *taught by Andrew Jaffe, PhD and John Muschelli, PhD*
Spring 2020	**Statistics for Laboratory Scientists I and II**, *taught by Ingo Ruczinski, PhD*
Spring 2019	**Statistical Methods in Public Health III and IV**, *taught by Marie Diener-West, PhD; Leah Jager, PhD; James Tonascia, PhD*
Fall 2018	**Methods in Biostatistics I and II**, *taught by Ciprian Crainiceanu, PhD*

Undergraduate Teaching Assistant

- Developed computer lab exercises on bioinformatic techniques to analyze omic data sets.
- Assisted students with homework and computing lab assignments.

- Led review sessions to reinforce topics introduced in lecture.

Spring 2017	**Introduction to Bioinformatics**, *taught by Patrick Fleming, PhD*
Fall 2016	**Biochemistry I**, *taught by Patrick Fleming, PhD*
Summer 2016	**Discrete Mathematics**, *taught by Fred Torcaso, PhD*

Service

Biostatistics Student Organization Co-founder and President

Baltimore, MD

Johns Hopkins Bloomberg School of Public Health, Department of Biostatistics — *August 2020 – PRESENT*

- Established a student organization to facilitate student-to-student and student-to-faculty communication in the department and advocate for student needs.
- Organized monthly meetings to discuss student concerns, activities, and other initiatives.

PhD Student Mentoring Committee Chair

Baltimore, MD

Johns Hopkins Bloomberg School of Public Health, Department of Biostatistics — *August 2019 – PRESENT*

- Established mentoring program to enable students to collaboratively enhance skills, share knowledge, and experience growth through peer mentoring.
- Organized training sessions regarding mental health awareness, prevention, and treatment for mentors as well as mentor resources.

PhD Student Event Committee Chair

Baltimore, MD

Johns Hopkins Bloomberg School of Public Health, Department of Biostatistics — *August 2019 – Present*

- Organized luncheons discussing student well-being, concerns, and career opportunities.

Graduate Program Recruiting Committee

Baltimore, MD

Johns Hopkins Bloomberg School of Public Health, Department of Biostatistics — *February 2018 – Present*

- Assisted with recruitment weekend events and interviews.
- Met with prospective and admitted students.