

Avery Davis Bell

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EDUCATION

PhD, Harvard University 2012-2019

- Program in Genetics and Genomics, Biological and Biomedical Sciences Program
- Advisor: Steven McCarroll

BA, Swarthmore College 2008-2012

- Major in Biology, Minor in Sociology & Anthropology (Highest Honors)

RESEARCH EXPERIENCE *(selected)*

Postdoctoral research with Annalise Paaby May 2020 – Present

Georgia Institute of Technology, School of Biological Sciences

- Computational genetics investigations of evolution using RNA sequencing data from the model organism nematode *Caenorhabditis elegans*

Postdoctoral research with Steven McCarroll September 2019 – January 2020

Harvard Medical School, Department of Genetics

- Continued investigation of recombination and aneuploidy from sequencing human sperm genomes with Sperm-seq (method developed by me during my PhD)
- Initial application of Sperm-seq to patients with infertility

Dissertation research with Steven McCarroll March 2013 – August 2019

Harvard Medical School, Department of Genetics

- Insights about recombination and aneuploidy from >30,000 haploid human sperm genomes
- Developed and implemented cellular, molecular, and computational methods to sequence single sperm in droplets, generate completely phased genomes of the sperm donors, identify recombination and aneuploidy events in each single cell, and analyze inter- and intra-individual variation and correlation in and among meiotic phenotypes
- *Dissertation advisory committee:* Mark Daly, Stephen Elledge, Joel Hirschhorn

PUBLICATIONS

Insights into variation in meiosis from 31,228 human sperm genomes

- **Bell, A.D.**, Mello, C.J., Nemesh, J., Brumbaugh, S.A., Wysoker, A., McCarroll, S.A. (2020). *Nature*.
- *PMID: 32494014 | DOI: [10.1038/s41586-020-2347-0](https://doi.org/10.1038/s41586-020-2347-0)*

Analyzing Copy Number Variation with Droplet Digital PCR

- **Bell, A.D.**, Usher, C.L., McCarroll, S.A. (2018). *Methods Mol Biol* 1768, 143-160.
- *PMID: 29717442 | DOI [10.1007/978-1-4939-7778-9_9](https://doi.org/10.1007/978-1-4939-7778-9_9)*

A Loss-of-Function Splice Acceptor Variant in IGF2 Is Protective for Type 2 Diabetes

- Mercader, J.M., Liao, R.G., **Bell, A.D.**, Dymek, Z., Estrada, K., Tukiainen, T., Huerta-Chagoya, A., Moreno-Macias, H., Jablonski, K.A., Hanson, R.L., Walford, G.A., Moran, I., Chen, L., Agarwala, V., Ordonez-Sanchez, M.L., et al. (2017). *Diabetes* 66, 2903-2914.
- *PMID: 28838971 | DOI: [10.2337/db17-0187](https://doi.org/10.2337/db17-0187)*

Schizophrenia risk from complex variation of complement component 4

- Sekar, A., Bialas, A.R., de Rivera, H., **Davis, A.**, Hammond, T.R., Kamitaki, N., Tooley, K., Presumey, J., Baum, M., Van Doren, V., Genovese, G., Rose, S.A., Handsaker, R.E., Schizophrenia Working Group of the Psychiatric Genomics, C., Daly, M.J., McCarroll, S.M. et al. (2016). *Nature* 530, 177-183.
- *PMID: 26814963 | DOI: [10.1038/nature16549](https://doi.org/10.1038/nature16549)*

Impact of natural selection due to malarial disease on human genetic variation

- Gomez F., Ko W.-Y., **Davis A.**, Tishkoff S.A. (2013). Pp. 117-160 in *Primates, Pathogens, and Evolution*. Brinkworth, J.F. and Pechenkina, K., Eds.

PRESENTATIONS (*selected*)

Annual Meeting of the American Society of Human Genetics October 2019
Houston, TX

- *Talk:* Aneuploidy and recombination across chromosomes, gametes, and individuals from large-scale single-sperm sequencing

Annula Meeting of the American Society of Human Genetics October 2018
San Diego, CA

- *Talk:* Analysis of 33,527 haploid sperm genomes from 20 individuals reveals new relationships underlying meiotic recombination and aneuploidy

The Biology of Genomes Meeting May 2018
Cold Spring Harbor, NY

- *Poster:* 33,527 haploid sperm genomes from 20 individuals ascertained by a droplet-based single-sperm sequencing technology

HONORS AND AWARDS

Semi-finalist for Charles J. Epstein Trainee Awards Summer 2018
for Excellence in Human Genetics Research

- Selection based on abstract submitted to the 68th American Society of Human Genetics Meeting
- One of 60 / 670 trainee applicants selected as semi-finalists

Bok Center Certificate of Distinction in Teaching for Genetics 201 Fall 2013;
for LS1b Spring 2015

- Reflects an average student evaluation score of 4.5 / 5 or higher

Phi Beta Kappa, Swarthmore College May 2012

TEACHING EXPERIENCE

Co-instructor, 6-hour course: Algorithmic Thinking: February 2019
How you should be thinking about your data

Graduate and post-doc "nanocourse," Department of Genetics, Harvard Medical School

- Co-developed and co-taught material introducing algorithmic thinking (modular problem breakdown) and introductory R programming to implement algorithmic thinking
- Successful course will be offered again by multiple departments; students gave feedback that this course filled the gap between having a problem and being able to solve it with code

Assistant lead teaching associate for quantitative curriculum development: Fall 2017
BBS230 Analysis of the Biological Literature

Graduate introductory course, Biological and Biomedical Sciences, Harvard Medical School

- Developed curriculum for R programming and statistical analysis for the first year where quantitative curriculum was included in this course
- Developed, tested, and helped teach formative assessments implemented via an online platform and done in in-class groups
- Students reported increased familiarity and ability with performing analyses in R

Guest lecturer: Bio260.A: Molecular Biology Fall 2015

Undergraduate introductory course, Department of Biology, Massachusetts College of Pharmacy and Health Sciences

- Taught two lectures covering meiosis to two sections of 200 students, using clicker questions and activities for student engagement

Teaching Fellow: LS1b Genetics, Genomics, & Evolution Spring 2015

Undergraduate introductory course, Department of Life Sciences, Harvard University

- Led one three-hour section each week comprising problem session and instruction as well as laboratory experiments; graded 2-4 assignments per week
- Received 4.55 out of 5 on course evaluations (11 of 13 students responding) and unsolicited positive feedback verbally and via email from students

Teaching Assistant: Genetics 201 Principles of Genetics Fall 2013

Graduate introductory course, Department of Genetics, Harvard Medical School

- Prepared and taught original problems and demonstrations for section of 13 students in yeast, bacterial, fruit fly, nematode, and human genetics
- Received 5 out of 5 on course evaluations from all students (12 out of 13 students responding)

EDUCATION OUTREACH

High school cancer research outreach program June – July 2017 and 2018
weekly journal club co-facilitator

- *Dana-Farber / Harvard Cancer Center Continuing Umbrella of Research Experience*

Judge for genetics-related high school competitions

- First round essay judge, *American Society of Human Genetics* March 2018
DNA Day essay competition
- Second round essay judge, *American Society of Human Genetics* March 2014
DNA Day essay competition
- Proposal judge, *Barcoding Burlington high school project* November 2013

Program in Genetics and Genomics journal club co-organizer 2014-2017

Invited speaker for undergraduate student research club February 2016

- Spoke about my path to research and thesis research, *Massachusetts College of Pharmacy and Health Sciences Student and Professor Academic Research Kollaboration (SPARK)*