

Chris Arehart

Christopher.H.Arehart@colorado.edu | [LinkedIn](#)



I specialize in computational methods to model the biology of complex diseases such as obesity, inflammatory bowel disease, addiction, and atopic dermatitis. I have led analyses across diverse omics layers – genomics, transcriptomics, proteomics, and metabolomics – and I am deeply committed to team science as a driver of innovation in drug target discovery, therapeutic development, and personalized medicine.

Education

University of Colorado Boulder (8/2021 – present; anticipated graduation 5/2026)

- PhD Candidate, Advisor: Luke M. Evans, GPA: 3.98
- Institute for Behavioral Genetics
- Department of Ecology and Evolutionary Biology
- Interdisciplinary Quantitative Biology program at the BioFrontiers Institute

University of Colorado Boulder (8/2015 – 12/2018)

- B.S. Applied Mathematics with minor in Leadership Studies (GPA: 3.68)
- Emphasis on computational biology (bioinformatics) and pre-medical curriculum (chemistry, biology, physics, humanities).
- Engineering Honors Program, Presidents Leadership Class: coursework dedicated to leadership, philosophy, public speaking, writing, critical thinking, global issues, and ethical decision making.

Fairview High School (8/2011 – 5/2015)

- International Baccalaureate (IB) Diploma Program Graduate; summa cum laude

Research Experience

University of Colorado Boulder (8/2021 – present)

- **PhD Student** in Luke Evans' lab (department of Ecology and Evolutionary Biology)
 - Completed research rotations as a student in the Interdisciplinary Quantitative Biology program at them BioFrontiers Institute with curriculum/program certificate.
 - Institute for Behavioral Genetics (IBG) trainee with curriculum/program certificate.
 - Appointed to the IBG NIMH T32MH016880 training grant (2 years).
 - PhD dissertation projects:
 - Poly-omic risk scores predict inflammatory bowel disease diagnosis
 - Modeling the genomic architecture of adiposity and anthropometrics across the lifespan
 - Biological networks link mental health drugs to weight-related adverse side effects
 - Retrospectively assessing pharmacological smoking cessation treatment success using genetically predicted nicotine metabolite ratio
 - PhD dissertation committee:
 - Luke M. Evans, Thesis Advisor
 - Christopher R. Gignoux, Thesis Advisor
 - Maggie A. Stanislawski, Thesis Advisor
 - Noah Fierer, Thesis Committee Member
 - Nolan C. Kane, Thesis Committee Member

University of Colorado Anschutz Medical Campus (1/2019 – 7/2021)

- **Bioinformatics Analyst** for the Department of Biomedical Informatics Data Analysis Core advised by Kathleen C. Barnes, Christopher R. Gignoux, Michelle Daya, Rasika A. Mathias, and Margaret A. Taub.
 - Bioinformatics software & pipeline development (R, BASH, GitHub)
 - Developed polygenic scoring pipeline for the Colorado Center for Personalized Medicine Biobank
 - High performance computing (Anschutz's Rosalind HPC and Eureka HPC in Google Cloud)
 - Cleaning and analyzing various -omics datasets: DNA whole genome sequencing (WGS); DNA genotyping chip; genotype imputation, RNA sequencing, metabolomics, machine learning (random forests, mixed effects models, etc.), genome wide association studies (GWASs), polygenic risk scores (PRS, PGS).
 - Data visualization & manuscript preparation
 - Presenting research at colloquia and national conferences

University of Chicago (2017)

- **Summer Research Internship** with Andrey Rzhetsky at the Conte Center for Computational Neuropsychiatric Genomics.
 - NSF funded Research Experience for Undergraduates (REU)
 - Prepared manuscript focused on modeling opioid overdoses in a population with comorbid psychiatric disorders.
 - Arehart, C. H., Mah'moud, M. A., Rzhetsky, A. (2017). Multiple psychiatric comorbidities drastically increase risk of opioid overdose.

University of Colorado Boulder (2016, 2018)

- **Summer Research Internships** with Vanja Dukic and Michael Z. David
 - Two Undergraduate Research Opportunities Program (UROP) summer stipends awarded to research infectious disease surveillance in the United States.
 - Published manuscript modeling whooping cough incidence using state-level Google search trends.

Clinical Experience

Anchor Physical Therapy (2018)

- Physical therapy aide
 - Assisted physical therapists in patient care including case history, scribing, and patient treatment.
 - Used conversational Spanish to communicate with Spanish-speaking patients.

Denver Recovery Group (2018)

- Intern at a methadone clinic where I interacted with patients recovering from opioid addictions and shadowed doctors and counselors.
- Performed analysis and visualization of internal survey data.

Longmont United Hospital (2017)

- Hospital patient ambassador - twice per week worked in clinical settings to observe and assist with patient care.

Teaching & Mentorship

2024 International Genetic Epidemiology Society (IGES) Education Workshop (2024)

- Co-developed and co-instructed a conference workshop titled: Development and Evaluation of Polygenic Risk Scores for Application in Diverse Populations.

Summer Multicultural Access to Research Training (SMART) program mentor (2023, 2024)

- Mentored undergraduate research projects.

IB/AP Math & Science Tutor (2015 – 2020)

- Taught algebra, geometry, elementary functions, calculus, physics, and biology to high school students.

Publications

- Arehart, C. H.**, Lin, M., Gibson, R., Raghavan, S., Gignoux, C. R., Stanislawski M. A., Grotzinger, A. D., Evans, L. M. (2025). Modeling the genomic architecture of adiposity and anthropometrics across the lifespan. *Nature Communications* 16, 7494 (2025). 10.1038/s41467-025-62730-w
- Arehart, C. H.**, Sterrett, J., D., ..., Gignoux, C. R., Evans, L. M., Stanislawski M. A. (2023). Poly-omic risk scores predict inflammatory bowel disease diagnosis. *mSystems*. 2023 Dec 14:e0067723. 10.1128/msystems.00677-23
- Arehart, C. H.**, Arehart, J. H., David, M. Z., D'Amico, B., Sozzi, E., Dukic, V., Pomponi, F. (2023). MONOPOLI: A customizable model for forecasting COVID-19 around the world using alternative nonpharmaceutical intervention policy scenarios, human movement data, and regional demographics. *Handbook of Visual, Experimental and Computational Mathematics. Springer, Cham*. 10.1007/978-3-030-93954-0_2-1
- Evans, L. M., **Arehart, C. H.**, Grotzinger, A. D., ... Stitzel, J. A., Ehringer, M. A., Hoeffler, C. A. (2023). Transcriptome-wide gene-gene interaction associations elucidate pathways and functional enrichment of complex traits. *PLoS Genetics*. 2023 May 22;19(5):e1010693. 10.1371/journal.pgen.1010693
- Lee, L. P., Dimos, S., ..., **Arehart, C. H.**, Avery, C. L., & Graff, M. (2023). Increasing of ancestral diversity in lipoprotein(a) studies helps address evidence gaps. *Open Heart*. 2023 Aug;10(2): e002382. 10.1136/openhrt-2023-002382
- Arehart, C. H.**, Daya, M., ..., Mathias, M. A., Barnes, K. C. (2022). Polygenic prediction of atopic dermatitis improves with atopic training and filaggrin factors. *The Journal of Allergy and Clinical Immunology*, 149(1), 145–155. h10.1016/j.jaci.2021.05.034
- Johnson, R. K., ..., **Arehart, C. H.**, Taub, M. A., Mathias, R. A., Reisdorph, N., Barnes, K. C., & Daya, M. (2022). Discovering metabolite quantitative trait loci in asthma using an isolated population. *The Journal of Allergy and Clinical Immunology*, 149(5), 1807–1811.e16. 10.1016/j.jaci.2021.11.002
- Arehart, C. H.**, David, M. Z., & Dukic, V. (2019). Tracking U.S. Pertussis Incidence: Correlation of Public Health Surveillance and Google Search Data Varies by State. *Scientific Reports*, 9(1), 19801. 10.1038/s41598-019-56385-z

In Review:

- Stanislawski, M. A., Litkowski, E., **Arehart, C. H.**, ... North, K. E., Burk, R. D., Kaplan, R. C. Host genetics and gut microbiota associated with asthma among US Hispanics/Latino adults. *Nature Communications*.
- Slack, S. D., Esquinca, E., **Arehart, C. H.**, ..., Johnson, R. K. Prediction and Characterization of Genetically Regulated Expression of Target Tissues in Asthma. *The Journal of Allergy and Clinical Immunology*.
- White, S. L., Brasher M. S., ... **Arehart, C. H.**, ..., Gignoux, C. R., Pozdeyev, N. Global multi-ancestry genetic study elucidates genes and biological pathways associated with thyroid cancer and benign thyroid diseases. *Nature Genetics*

In Preparation:

- Arehart C. H.**, Evans, L. M. Biological network links mental health drugs to weight-related adverse side effects.
- Arehart C. H.**, Sherman, C. A., Claw, K. G., Evans, L. M., Retrospectively assessing pharmacological smoking cessation treatment success using genetically predicted nicotine metabolite ratio.
- Arehart, C. H.**, Taub, M. A., Johnson, R. K., ..., Barnes, K. C., Mathias, R. A. Regulatory landscape of CD4+ T cells with implications for asthma.

Lin, M., **Arehart, C. H.**, ..., Gignoux, C. R. Phenome-wide PGS portability in the Colorado Center for Personalized Medicine biobank suggests overlooked challenges in diverse populations.

Kakar, A., ..., **Arehart C. H.**, Evans, L. M., Stanislawski M. A. Multi-omic risk scores to predict change in BMI.

Evans, L. M., **Arehart C. H.**, Gibson R., Gignoux C.R., A simple approach for multiple observations improves power to detect genetic effects and genomic prediction accuracy, with specific application to samples of diverse ancestry.

Peer Review for Academic Journals

Communications Biology; Human Molecular Genetics (HMG); Journal of Allergy and Clinical Immunology (JACI); Nature Communications; Scientific Reports; Cell Genomics

Conference Presentations

- American Society of Human Genetics (ASHG November 2024 in Denver)
 - Poster: Modeling the genomic architecture of adiposity and anthropometrics across the lifespan. **Arehart, C. H.**, Lin, M., Gibson, R., Raghavan, S., Gignoux, C. R., Stanislawski M. A., Grotzinger, A. D., Evans, L. M.
- International Genetic Epidemiology Society (IGES November 2024 in Denver)
 - Education Workshop: Development and Evaluation of Polygenic Risk Scores for Application in Diverse Populations. Lin, M., Konigsberg I. R., **Arehart, C. H.**, Brasher, M., Lange, L., Caliebe, A., Gignoux, C. R.
- IQ Biology Symposium – Healthy Systems: How they Work, Bend, and Break (August 2024 in Boulder)
 - Lightning Talk & Co-Organizer: Modeling the genomic architecture of adiposity and anthropometrics across the lifespan. **Arehart, C. H.**, Lin, M., Gibson, R., Raghavan, S., Gignoux, C. R., Stanislawski M. A., Grotzinger, A. D., Evans, L. M.
- Cohorts for Heart and Aging Research in Genomic Epidemiology (CHARGE May 2024 in Denver)
 - Poster: Modeling the genomic architecture of adiposity and anthropometrics across the lifespan. **Arehart, C. H.**, Lin, M., Gibson, R., Raghavan, S., Gignoux, C. R., Stanislawski M. A., Grotzinger, A. D., Evans, L. M.
- American Society of Human Genetics (ASHG October 2022 in Los Angeles)
 - Poster: Improving the selection of variants included in polygenic risk scoring models. **Arehart, C. H.**, Lin, M., Evans, L. M., Gignoux, C. R.
 - Co-author Poster: Phenome-wide PGS portability in the Colorado Center for Personalized Medicine biobank suggests overlooked challenges in diverse populations. Lin, M., **Arehart, C. H.**, Rafaels, N., Crooks, K. R., Pozdeyev, N., Hendricks, A., Raghavan, S., Gignoux, C. R., on behalf of the CCPM Clinical PRSUIT Working Group
 - Co-author Poster: Epigenetic signatures of asthma in nasal epithelium from African ancestry populations from the CAAPA consortium
- American Society of Human Genetics (ASHG October 2021 held remotely)
 - Poster: Regulatory landscape of CD4+ T cells with implications for asthma. **Arehart, C. H.**, Taub, M. A., Johnson, R. K., ..., Barnes, K. C., Mathias, R. A.
- American Society of Human Genetics (ASHG October 2019 in Houston)
 - Poster: Using polygenic risk scores to identify risk for asthma in an underrepresented population. **Arehart, C. H.**, Daya, M., ..., Mathias, R. A., Barnes, K. C.

Other Leadership and Work Experience

University of Colorado Women's Basketball Practice Team (2015 – 2018)

- Leader of the men's practice team for training with the CU women's D1 team.

City of Boulder Parks and Recreation **(2015)**

- Kids camp counselor for the science and tennis summer camps.