Chloee McLaughlin, Ph.D.

Genomics & Bioinformatics · Plant Biology · Science Communication

Fort Collins, CO

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Summary

Current computational biologist at the HudsonAlpha Institute for Biotechnology Genome Sequencing Center. I am a data-driven problem-solver with a passion for leveraging genomic data to answer biological questions. I value interdisciplinary collaborations and have a demonstrated ability to communicate to broad audiences.

Education

Ph.D. in Plant Biology

State College, PA

Pennsylvania State University

Aug. 2019 - Aug. 2024

- Thesis: Local adaptation of crop landraces

B.S. in Botany

Gainesville, FL

The University of Florida

Aug. 2015 - May 2019

- Minor in Wildlife Ecology and Conservation

Related Experience

Computational Biologist

Huntsville, AL (Remote)

HudsonAlpha Institute for Biotechnology

Oct. 2024 - Present

Genomics and Bioinformatics

- Deployed scalable bioinformatics pipelines to generate VCFs and reference-free data, used in downstream analysis.
- Applied bioinformatics expertise across diverse plant systems (Sorghum, Maize, Pecan, Strawberry, Pennycress) to relate genomic data to underlying biological questions.

Ph.D. Student and Graduate Researcher

State College, PA

Pennsylvania State University

Aug. 2019 - Aug. 2024

Genomics and Bioinformatics

- Integrated genomic, transcriptomic, phenotypic, and physiological data to investigate local adaptation in cereal crop landraces (native varieties).
- Developed a novel machine learning approach to predict phenotypic variation across environmental space. Identified locally adapted quantitative trait loci (QTL) using phenotype-environment associations of complex traits (root anatomy, microbiome).
- Utilized population genomics and species forecasting techniques (gradient forest, genomic offset) to predict maladaptation in cereal crops landraces following an extreme climate event.
- Characterized trade-offs in physiological traits and biotic interactions coupled with loss-of-function at strigolactone genes in Sorghum bicolor.

Collaboration, Writing, and Communication

- Maintained an open-collaborative working environment with mentors and mentees on interdisciplinary projects.
- Authored six publications with one additional manuscripts in review.
- Presented research at seven conferences, three symposiums, and three departmental seminars.

Undergraduate Student and Research Assistant

Gainesville, FL

University of Florida

Aug. 2016 - May 2019

Plant Cultivation and Industry Knowledge

- Co-invented the commercial downy mildew-resistant basil variety, 'Besto Pesto', released through the horticultural company Proven Winners.
- Led screening trials, data collection, plant performance assessments, and managed four students.

Skill Sets

Data Science R, Linux, Git, bash scripting, high performance computing (HPC), statistical analyses, data visualization

Bioinformatics Production-level variant calling, pangenomics (integration of long and short-read genomic datasets), genome wide association (GWA), transcriptomics, crop modeling

Professional Development & Workshops

2021 **Genomics-Enabled Restoration Workshop**, Population genomics research group
2021 **World Campus Teaching Certificate**, Penn State World Campus course
2020 **Summer Institute in Statistical Genetics**, University of Washington
2020 **Bioinformatics Data and Reproducibility**, (BDR) Bootcamp
2020 **International Conference of Quantitative Genetics**, Quantitative genetics workshop

Awards & Acknowledgements

2025 **Next Gen Leadership Award**, AGBT - Agriculture
2024 **Early Career Award**, International Phytobiomes Alliance
2024 **Plant and Animal Genome Travel Award**, PSU One Health Microbiome Center
2023 **Walter Thomas Memorial Scholarship**, PSU College of Ag. Science
2023 **International Travel Award**, PSU Huck Institute of the Life Sciences
2022 **J. Ben and Helen D. Hill Memorial Fund Award**, PSU College of Biology
2021 **Walter Thomas Memorial Scholarship**, PSU College of Ag. Science

DEI & Involvement

Graduate Student Representative *State College, PA*
Plant Science Department *July 2021 - Dec. 2023*
- Elected by peers to participate in and provide a graduate student perspective at Plant Science faculty meetings.

Diversity, Equity, and Inclusion Committee *State College, PA*
Plant Science Department *July 2020 - Dec. 2022*
- Committee member and head of a sub-committee that promotes belonging within the plant science department.

Letters to a Pre-Scientist *Remote*
STEM Professional *July 2020 - Dec. 2022*
- Acted as pen-pal to a middle schooler to demystify STEM and encourage students from low-income areas.

Smithsonian Habitat Camps *Washington, DC*
Group leader *2018*
- Developed and taught curriculum for middle school STEM camps focusing on preserving plant biodiversity.

Select Presentations

CSU Plant Adaptation Symposium. Invited Talk. *Fort Collins, CO*
A pangenomic resource illuminates genetic diversity in the sorghum carotenoids pathway *2026, Feb. 5*
- Symposium sponsored by Corteva.

Plant Animal Genome Conference. Invited Talk. *San Diego, CA*
Count the cost: Trade-offs associated with low germination stimulant 1. *2024, Jan. 17*
- Sponsored by the Penn State One Health Microbiome Center.

Center for Root and Rhizophere Biology Retreat. Invited Talk. *State College, PA*
Evidence that variation in root anatomy contributes to local adaptation in native maize *2023, May 23*
- Invited by the Center for Root and Rhizosphere Biology.

Select Publications

Google Scholar

Chloee M. McLaughlin, et al. (2024). Maladaptation in cereal crop landraces following a soot-producing climate catastrophe. ***Nature Communications***.

G. Morris*, A. Harder*, A. Healey*, **Chloee M. McLaughlin***, J. Rifkin*, et al. (2026). A pangenomic resource for sorghum crop improvement. In Press at ***Nature***.

Chloee M. McLaughlin, et al. (2024). Evidence that variation in root anatomy contributes to local adaptation in Mexican native maize. ***Evolutionary Applications***.

* denotes co-first author