Naomi Huntley

Computational Biologist | Statistical Genomics & Microbiome Scientist

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Professional Summary

PhD candidate in Biology with integrated wet lab and computational expertise spanning multi-omics data generation, processing, and analysis. Specializes in host genetics, microbiome science, and statistical genomics, with experience in GWAS, multi-omic data integration, and development of reproducible R/Python pipelines. Skilled in translating complex biological questions into scalable, quantitative analyses, with a strong track record of interdisciplinary collaboration, scientific leadership, teaching, and peer-reviewed research.

Education

PhD Candidate in Biology – The Pennsylvania State University, University Park, PA
Advisor: Dr. Emily Davenport

Masters in Marine and Environmental Science – The University of the Virgin Islands
Advisor: Dr. Amy Apprill and Dr. Tyler Smith

B.S. – The University of Michigan, Ann Arbor, MI

A.S. with High Honors – Mott Community College, Flint, MI

Publications

- Liu S, et al. Analysis of metagenomic data. Nat Rev Methods Primers. (2025). https://doi.org/10.1038/s43586-024-00376-6
- **Huntley N**, Experimental transmission of SCTLD results in differential microbial responses within coral mucus and tissue. Reef Encounter. (2023).
- Rosales SM, et al. A meta-analysis of the stony coral tissue loss disease microbiome finds key bacteria in unaffected and lesion tissue in diseased colonies. ISME COMMUN. 3, 19 (2023). https://doi.org/10.1038/s43705-023-00220-0
- **Huntley N**, et al. Experimental transmission of Stony Coral Tissue Loss Disease results in differential microbial responses within coral mucus and tissue. ISME COMMUN. 2, 46 (2022). https://doi.org/10.1038/s43705-022-00126-3
- Weber L, et al. Benthic exometabolites and their ecological significance on threatened Caribbean coral reefs. ISME COMMUN. 2, 101 (2022). https://doi.org/10.1038/s43705-022-00184-7
- Laramore S, Courtemanche C, **Huntley N**. Differential effects of increased salinity on growth and survival of a native and a nonnative apple snail species. J. Molluscan Stud. 88, 1 (2022). https://doi.org/10.1093/mollus/eyab047

- Meiling SS, et al. Variable Species Responses to Experimental Stony Coral Tissue Loss Disease (SCTLD) Exposure. Front. Mar. Sci. (2021). https://doi.org/10.3389/fmars.2021.670829
- Sanchez KF, **Huntley N**, et al. (2018) Toxins or Medicines? Phytoplankton diets mediate host and parasite fitness in a freshwater system. Proc. R. Soc. B:Biol. Sci. doi: 10.1098/rspb.2018.2231
- Laramore S and **Huntley N**. (2015) Effects of Saltwater Intrusion on Native and Exotic Apple Snails, *Pomacea paludosa* and *P. insularum*. J. Shellfish Res. 34 (2), 651-651.

Research Experience

PhD Research Assistant

The Pennsylvania State University | August 2020-Present

- Conduct interdisciplinary research at the intersection of host genetics, microbiome science, and computational biology.
- Develop analytical pipelines for GWAS, enrichment analyses, and high-dimensional omics datasets.
- Integrate genomic and microbiome datasets to identify biologically meaningful associations.
- Create publication-quality visualizations and reproducible workflows in R and Python.
- Apply and extend methods in statistical genetics and microbiome analysis (e.g., enrichment frameworks, multivariate association testing, and dimensionality reduction approaches)
- Produce reproducible, publication-quality analyses and visualizations using R and Python
- Contribute to microbiome experimental workflows, including sample processing and sequencing data interpretation
- Mentor junior trainees in statistical analysis, programming, and study design for genomics and microbiome research projects

Industry Intern

QIAGEN | June-August 2025

- R&D internship optimizing DNA extraction workflows for challenging microbiome and molecular diagnostics sample types
- Benchmarked performance of QIAGEN and competitor DNA extraction kits across diverse biological matrices
- Identified limitations in extraction efficiency, robustness, and sample compatibility across current kit workflows
- Contributed to life cycle management efforts to streamline product portfolio and reduce production complexity and cost
- Expanded kit performance claims by evaluating applicability across a broader range of sample types

- Proposed optimization strategies to improve kit versatility and enable more universal extraction workflows
- Presented results and discussed findings with QIAGEN R&D scientists and product development teams
- Gained exposure to industrial R&D pipelines, product development cycles, and cross-functional biotechnology research workflows

Master's Research Assistant

University of the Virgin Islands | Aug 2018 – Apr 2020

Co-advisors: Dr. Tyler Smith and Dr. Amy Apprill

- *Thesis*: Investigated the microbiome of a transmissible Caribbean coral disease outbreak in St. Thomas, U.S. Virgin Islands.
- Coordinated a cross-institutional collaboration between the University of the Virgin Islands and Woods Hole Oceanographic Institution.
- Conducted coral health monitoring, benthic surveys, sedimentation assessments, and water-quality measurements using SCUBA.
- Performed molecular analyses including DNA extraction, PCR, and sequencing preparation.
- Studied harmful algal species linked to Ciguatera Fish Poisoning using ecological and molecular methods.

Guest Researcher

Woods Hole Oceanographic Institution | Aug 2019 – Jun 2020

- Applied molecular biology methods including DNA extraction, PCR, gel electrophoresis, and next-generation sequencing.
- Completed advanced training in bioinformatics.
- Contributed to collaborative marine microbiome research projects.

Selected Early Research Experience

NSF Research Experience for Undergraduates (REU)

Bermuda Institute of Ocean Sciences | Aug 2015 – Nov 2015

- Investigated physiological responses of Atlantic corals to sustained low-temperature stress.
- Conducted coral husbandry, tank experiments, field collections, and coral outplanting.
- Collaborated internationally and mentored an undergraduate trainee.

NSF Research Experience for Undergraduates (REU)

Harbor Branch Oceanographic Institute, Florida Atlantic University | Jun 2014 – Aug 2014

- Independently designed and executed experiments on salinity stress in native and invasive apple snails.

University of Michigan | 2012 – 2016

- Freshwater Ecology Lab: parasite ecology experiments and sterile algal culture isolation.
- Microplastics in the Great Lakes: quantified plastics and assessed bacterial communities using PCR.
- Cardiovascular Surgery: helped develop quality-improvement dashboards for clinical decision support.

Grants, Fellowships, and Awards

2025 The One Health Microbiome Center Industry Internship at QIAGEN
2024 PSU One Health Microbiome Center Data Analysis Leadership Fund
2023 Summer Institute in Statistical Genetics University of Washington Scholarship
2022 PSU One Health Microbiome Center Data Analysis Leadership Fund
PSU Interdisciplinary Innovation Fellowship
2020 National Science Foundation Graduate Research Fellowship, Honorable Mention
University Graduate Fellowship
Dean's Distinguished Graduate Scholar
Verne M. William Distinguished Graduate Fellow
Braddock Scholarship
2019 International Coral Reef Society Graduate Fellowship
Lana Vento Charitable Foundation Research Grant
Lana Vento Charitable Foundation Travel Grant
2018 Lana Vento Charitable Foundation Research Grant
Lana Vento Charitable Foundation Travel Grant
2016 University of Michigan Scott Turner Award
Bermuda Institute of Ocean Sciences/NSF Travel Grant
2015 Bermuda Institute of Ocean Sciences/NSF REU
2014 Florida Atlantic University, Harbor Branch/NSF REU

Leadership, Mentoring & Teaching Experience

Teaching Assistant

Penn State University | Aug 2022 – Dec 2025
Course: Ecology and Evolutionary Biology

- Led undergraduate laboratory sections, instructing students in experimental design, data analysis, and application of the scientific method
- Taught foundational quantitative and computational skills including statistics, Excel-based analysis, and data interpretation
- Provided mentorship during office hours and guided student research project development and troubleshooting
- Supported development and refinement of course teaching materials and laboratory protocols

- Evaluated and graded assignments, providing structured feedback on scientific writing and analytical reasoning

Director, Data Analysis Working Group

One Health Microbiome Center, Penn State | Jan 2023-Aug 2024

- Directed the Data Analysis Working Group within the One Health Microbiome Center, leading strategic development of microbiome data science training and collaborative research support
- Designed and led recurring workshops and training programs in microbiome analytics, including 16S rRNA gene sequencing, ITS fungal profiling, and metagenomic data analysis
- Promoted reproducible research practices and development of computational and statistical analysis skills within the community
- Facilitated interdisciplinary collaboration among students, postdocs, and faculty across microbiome-related research areas
- Advanced center-wide adoption of reproducible research practices, standardized analytical workflows, and computational best practices for microbiome data analysis
- Oversaw collaborative data analysis initiatives supporting research groups lacking in-house bioinformatics expertise, enabling integration of microbiome components into diverse project

Program Coordinator

Sea Islands Alliance Bridge to Ph.D. Program | Aug 2020 – Jul 2022

- Co-developed curriculum and training materials for students preparing for graduate study in STEM.
- Designed and managed program application processes; reviewed and evaluated applicants.
- Led laboratory experiments and hands-on scientific training activities.
- Delivered instructional sessions on research methods and academic preparation.
- Mentored students through graduate school readiness, research skills, and career development.

Core Technical Skills

- **Statistical Genetics**: PLINK, LDSC, MAGMA, Mendelian Randomization, GWAS, heritability analysis, enrichment testing
- **Single-Cell & Omics**: Seurat, AnnData, scRNA-seq integration, UMAP, cell type annotation
- **Microbiome Bioinformatics**: QIIME2, DADA2, amplicon sequencing (16S/ITS), diversity analysis, taxonomic profiling
- **Programming and Computing**: R, Python, Bash scripting, Linux/HPC, Git, Slurm
- **Molecular Biology**: qPCR, digital PCR, DNA extraction, PCR, gel electrophoresis, sequencing library prep (16S, ITS, WGS)
- **Statistics**: Regression, mixed models, PERMANOVA, multivariate analysis, machine learning basics, multiple testing correction

- **Research Operations**: mentoring, project coordination, scientific communication

Scientific Talks & Presentations

2025 **Huntley, N.**, & Davenport, E. Microbiome associated host variants act in tissues beyond sampling sites. Biology of Genomes. Cold Spring Harbor, NY.

2023 **Huntley, N**., & Davenport, E. Tissues where host genetic variation acts to impact gut microbiome abundance. American Society of Human Genetics. Washington D.C.

2023 **Huntley, N.** Building Trust Through Experience – Demystifying The Microbiome. Communicating Novelty and Controversy in Ecology and Evolution in Infectious Disease Workshop. Penn State University.

2022 **Huntley, N**. et al. The microbiome of a transmissible panzootic disease: A purported Stony Coral Tissue Loss Disease outbreak in the Caribbean U. S. Virgin Islands. International Coral Reef Symposium.

2021 **Huntley, N**. et al. The microbiome of a transmissible panzootic disease: A purported Stony Coral Tissue Loss Disease outbreak in the Caribbean U. S. Virgin Islands. International Coral Reef Symposium.

2019 **Huntley, N**. Effects of major wind disturbances on the resilience of Magens Bay Arboretum in the Magens Bay Watershed Preserve of Saint Thomas USVI: An Altered Basin Moist Forest. Research Day, University of the Virgin Islands.

2019 **Huntley, N.** The Microbiome of purported Stony Coral Tissue Loss Disease. Student Research Seminar. University of the Virgin Islands.

2018 **Huntley, N.** Coral-Ramicrusta microbial interactions. Student Research Seminar. University of the Virgin Islands.

2016 **Huntley, N**. Ecophysiology of a Coral Species in the Northernmost Atlantic Reef System: Effects of Low Temperatures on *Siderastrea radians* in Bermuda. International Coral Reef Symposium. Honolulu, HI.

2015 **Huntley, N.E.** Ecophysiology of a Coral Species in the Northernmost Atlantic Reef System: Effects of Low Temperatures on *Siderastrea radians* in Bermuda. Summer Student Research Seminar; Bermuda Institute of Ocean Sciences, St. George, Bermuda.

2014 **Huntley, N.E.** Effects of saltwater intrusion on native and exotic apple snails, *Pomacea paludosa* and *P. maculata*. Summer Student Research Seminar; Fl. Atlantic Uni.

2013 **Huntley, N.E.** Evaluation and Improvement of Cardiac Surgery. University Research Opportunity Program Symposium, University of Michigan.