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BLAIR T. BLAKENEY

Education

The University of North Carolina at Chapel Hill May 2024
B.S. Biology, Minors in Data Science and Environmental Science and Studies

- Graduated with Highest Distinction
- GPA: 4.0

Honors and Awards

- Coker Award, April 2024
  - Awarded by the UNC-Chapel Hill Department of Biology to a senior biology major for excellence in research in organismal biology and ecology
- Highest Honors, April 2024
  - Awarded by the UNC-Chapel Hill Department of Biology for a senior honors thesis that demonstrates exceptional scholarly achievement
- Travel Award, June 2023
  - Awarded by the UNC-Chapel Hill Office of Undergraduate Research to support travel to the Evolution Conference in Albuquerque, New Mexico
- Summer Undergraduate Research Fellowship, May 2023
  - Awarded by the UNC-Chapel Hill Office of Undergraduate Research as part of a competitive University-wide application process to support 180+ hours of research over the summer
- Phi Beta Kappa Society, Fall 2022-Present

Research Interests

Evolutionary Biology • Computational Biology • Evolutionary Genetics • Recombination • Mutation

Relevant Coursework

Ecology & Evolution • Evolutionary Mechanisms • Molecular Biology & Genetics • Evolutionary Genetics • Mathematics of Evolutionary Processes • Behavioral Ecology • Introduction to Programming • Data Structures & Analysis • Foundations of Statistics & Data Science • Statistics for Environmental Scientists

Summary of Research Skills

Python, R, & Linux (HPC) • Bioinformatics & Sequence Analysis • Computational Algorithm Development • Evolutionary Modeling • DNA Extraction & Quality Assessment • Experimental Design • Statistical Analysis • Data Visualization • Grant Writing • Scientific Communication • Mentorship & Collaborative Research

Research Experience

Yoder Lab, Department of Biology August 2024-Present
Duke University
Principal Investigator: Dr. Anne Yoder, Braxton Craven Professor of Evolutionary Biology
Associate in Research
Project synopsis: I am building the first recombination maps for the gray mouse lemur (*Microcebus murinus*) by tracking SNP inheritance across three generations of individuals in a pedigree.

- Developed a SNP filtering pipeline for accurate pedigree reconstruction using the software *Sequoia*
- Wrote algorithms in R to construct recombination maps following established pedigree-based methods
- Performed DNA extractions from mouse lemur blood and tissue and assessed DNA quality with NanoDrop and Qubit
- Executed cryopreservation protocols for mouse lemur tissue and safely transported samples on dry ice
- Mentored an undergraduate in genomic analyses, including weekly sessions on R programming and HPC use
- Inventoried and organized lab equipment, reagents, and biological samples into a searchable digital repository
- Critically monitored -20°C and -80°C freezers and coordinated maintenance when necessary

Burch Lab, Department of Biology June 2022-July 2024
The University of North Carolina at Chapel Hill
Principal Investigator: Dr. Christina Burch, Professor & Associate Chair of Department of Biology

Research Technician (June 2024-July 2024)
Project synopsis: I characterized genetic changes accumulated during evolution experiments using the bacteriophage T7 to assess the repeatability of evolution across independent lineages.

- Analyzed Oxford Nanopore sequence data for T7, enhancing the sequence analysis pipeline's efficiency
- Characterized SNPs and deletions in independent lineages of T7, highlighting convergent and divergent evolution
- Performed statistical analysis to track the frequency of SNPs and deletions over time in evolution experiments
- Collaborated in a team, maintaining a code repository on GitHub and regularly presenting progress to the group

Undergraduate Research Assistant (June 2022-May 2024)
Project synopsis: I investigated how different mechanisms of uniparental reproduction affect the ability to colonize new environments after an evolutionary transition from biparental reproduction.

- Programmed in Python to simulate the evolution of uniparental reproduction using a gene regulatory network model
- Managed evolution experiment data via Linux on a high-throughput computing cluster
- Compiled and visualized results using R, presenting figures to lab members and incorporating feedback
- Evaluated relevant literature and designed experiments in collaboration with graduate students and principal investigator
- Engaged in complex discussions of theory and code debugging within a group, driving project advancement

Research Presentations

- Blair Blakeney*, Adriana Coke-Schlachter, Christina Burch. *The road less traveled: modeling transitions from biparental to uniparental reproduction*. Evolution Conference. Albuquerque, New Mexico. June 22, 2023. [Poster Session]
- Blair Blakeney*, Adriana Coke-Schlachter, Christina Burch. *Modeling transitions from biparental to uniparental reproduction in tardigrades.* BIOL 395 Research Poster Symposium. Chapel Hill, North Carolina. November 14, 2023. [Poster Session]
- Blair Blakeney. *Investigating transitions from biparental to uniparental reproduction during colonization.* John K. Koeppe Biology Undergraduate Honors Research Symposium. Chapel Hill, North Carolina. March 25, 2024. [Talk]
- Blair Blakeney*, Adriana Coke-Schlachter, Christina Burch. *Modeling transitions from biparental to uniparental reproduction in tardigrades.* Celebration of Undergraduate Research. Chapel Hill, North Carolina. April 29, 2024. [Poster Session]
- Blair Blakeney*, J. Carolina Segami, Sajni Patel, Anne D. Yoder. *Building recombination maps for the gray mouse lemur using pedigree data.* Evolution Conference. Athens, Georgia. June 23, 2025. [Poster Session]

Research Papers

- Blair Blakeney. *Investigating the evolutionary consequences of different reproductive modes.* Research paper completed for BIOL 395: Undergraduate Research in Biology. April 28, 2023.
- Blair Blakeney. *Investigating transitions from biparental to uniparental reproduction during colonization*. Manuscript completed for a senior honors thesis. March 22, 2024.

Tutoring and Student Engagement

BIOL 101: Principles of Biology, Department of Biology August 2021-May 2022
The University of North Carolina at Chapel Hill
Supplemental Instructor

- Answered student questions during 300+ person lectures twice a week
- Led office hours for ~15 students per week, providing content review and assistance to students seeking additional support
- Designed and distributed practice problems that extended student understanding beyond lectures
- Worked with a team of ~8 supplemental instructors to facilitate 4 exam review sessions per semester, contributing to content creation and gaining insights from peer-led instructional approaches
- Advised students on improving learning techniques, drawing on knowledge from a course on "The Science of Learning"

Leadership and Community Involvement

Duke Lemur Center May 2025-Present
Education Docent

- Led engaging public tours for visitors of all ages with discussions about lemur biology and the Center's mission
- Answered questions with professionalism and clarity related to species behavior, conservation, and non-invasive research
- Prepared for tours through independent study of video and written materials provided by the Center
- Volunteered at least two 2.5-hour shifts per month during the summer season (May-September)

The Chapel Hill Alt. Protein Project May 2022-May 2024
The University of North Carolina at Chapel Hill
Director of Course Development (May 2022-May 2024)

- Enriched content and led planning for UNC's first student-developed cellular agriculture course over two semesters
- Built relationships with 10+ guest speakers from innovative startups and academic research institutions
- Assembled comprehensive learning materials for course modules centered around alternative protein
- Delegated responsibilities and fostered collaboration among ~6 committee members involved in course development

Course Development Committee Member (February 2022-May 2022)

- Generated a database identifying 20+ courses suitable for the integration of alternative protein content
- Engaged with UNC professors to incorporate alternative protein content into relevant courses
- Coordinated and executed events aimed at educating the UNC community about sustainable meat alternatives

UNC ScienceDays January 2022-May 2022
The University of North Carolina at Chapel Hill
Lesson Planning Committee Member

- Collaborated with a team of ~7 to create engaging lesson plans for elementary and middle school students
- Adapted lesson plans based on constructive feedback from a testing committee
- Promoted inclusivity by highlighting profiles of underrepresented minorities in STEM within lesson plans