

Curriculum Vitae

Keaka Farleigh, Ph.D.

Department of Biology | University of Virginia

485 McCormick Road
326 Gilmer Hall
Charlottesville, VA 22904
Email: keakafarleigh@virginia.edu

WEBSITES AND SOCIAL MEDIA

Coding Repository: <https://github.com/kfarleigh>

Research profiles: [Google Scholar](#)
[ResearchGate](#)

Website: <https://kfarleigh.github.io>

PROFESSIONAL POSITIONS

- Sep 2024 NSF Postdoctoral Research Fellow
Project: *Investigating contact zones to understand the genomic and environmental underpinnings of reproductive isolation and adaptive introgression*
Research Advisors: Dr. Drew Schield, Dr. Jesse Meik
University of Virginia, Department of Biology
- Sep 2019-Aug 2024 NSF Graduate Research Fellow
Project: *Identifying genomic adaptations to diverse climates and habitats in *Dipodomys microps* populations*
Research Advisor: Dr. Tereza Jezkova
Miami University, Department of Biology
- Aug 2018-Aug 2019 Graduate Assistant
Miami University, Department of Biology
- June 2017-July 2017 NSF Student Researcher
Project: *Variability in development rate within and between clutches from individual female copepods (*Pseudodiaptomas forbesi*)*
Research Advisor: Dr. Wim Kimmerer
San Francisco State University, BREED REU Program

EDUCATION

- August 2024 **Ph.D Ecology, Evolution, and Environmental Biology.** Miami University
Dissertation title: *Exploring the genetic basis of local adaptation*
Advisor: Tereza Jezkova

May 2018 **B.A. Biology.** Capital University
Advisor: Christine Anderson

PUBLICATIONS

10. Hein, S. R., **Farleigh, K.**, & Berg, D. J. (2024). Riverscape genomics of the endangered freshwater mussel *Lampsilis rafinesqueana*. *Freshwater Biology*, 69, 1438–1453.
9. Pavón-Vázquez, C. J., Rana, Q., **Farleigh, K.**, Crispo, E., Zeng, M., Lilia, J., ... & Blair, C. (2024). Gene Flow and Isolation in the Arid Nearctic Revealed by Genomic Analyses of Desert Spiny Lizards. *Systematic Biology*, syae001.
8. Brunton, A.J., **Farleigh, K.**, Ogbourne, S.M., Rossetto, M., Schoeman, D.S., Conroy, G.C. (2024). The geno-geo-climate nexus: contributions of geographic and ecological factors in shaping the genomic divergence of two closely related threatened rainforest species of Fontainea Heckel (*Euphorbiaceae*). *Landscape Ecology*, 39(11).
7. **Farleigh, K.**, Ascanio, A., Farleigh, M.E., Schield, D.R., Card, D.C., Leal, M., Castoe, T.A., Jezkova, T., Rodriguez-Robles, J.A. (2023). Signals of differential introgression in the genome of natural hybrids of Caribbean anoles. *Molecular Ecology*, 32(22), 6000-6017.
6. **Farleigh, K.**, & Jezkova, T. (2023). Genetic signals of local adaptation in a desert rodent that occupies diverse climates and habitats. *Landscape Ecology*, 38, 3269-3284.
5. Koochekian, N., Ascanio, A., **Farleigh, K.**, Card, D. C., Schield, D. R., Castoe, T. A., & Jezkova, T. (2022). A chromosome-level genome assembly and annotation of the desert horned lizard, *Phrynosoma platyrhinos*, provides insight into chromosomal rearrangements among reptiles. *GigaScience*, 11.
4. Finger, N., **Farleigh, K.**, Bracken, J. T., Leaché, A. D., François, O., Yang, Z., ... & Blair, C. (2022). Genome-Scale Data Reveal Deep Lineage Divergence and a Complex Demographic History in the Texas Horned Lizard (*Phrynosoma cornutum*) throughout the Southwestern and Central United States. *Genome biology and evolution*, 14(1), evab260.
3. **Farleigh, K.**, Vladimirova, S. A., Blair, C., Bracken, J. T., Koochekian, N., Schield, D. R., ... & Jezkova, T. (2021). The effects of climate and demographic history in shaping genomic variation across populations of the Desert Horned Lizard (*Phrynosoma platyrhinos*). *Molecular Ecology*, 30(18), 4481-4496.
2. Santibáñez-López, C. E., **Farleigh, K.**, Cushing, P. E., & Graham, M. R. (2021). Restriction enzyme optimization for RADseq with camel spiders (Arachnida: *Solifugae*). *The Journal of Arachnology*, 48(3), 346-350.

1. **Farleigh, K.** (2018). Genetic estimates of migration for white-footed mice (*Peromyscus leucopus*) at the Primmer Outdoor Learning Center. *2018 NCUR Proceedings*.

Manuscripts in Review

Farleigh, K., Murphy, M.O., Blair, C., Jezkova, T. PopGenHelpR: An R package to streamline and facilitate informed population genomic analyses and visualization of genetic ancestry, diversity, and differentiation. *In review at Molecular Ecology Resources*.

Blair, C., Pavón-Vázquez, C., Rana, Q., **Farleigh, K.**, Crispo, E., Panzera, T., ... & Vazquez, U. G. Isolation and divergence of Greater Earless Lizards (Phrynosomatidae: *Cophosaurus*) in western North America support multiple diversification processes and indicate a cryptic species complex. *In review at Molecular Ecology*.

Prange, S., **Farleigh, K.**, Anderson, C.S. Evaluation of genetic diversity, inbreeding, and gene flow in declining populations of the gray fox (*Urocyon cinereoargenteus*) in Ohio. *In review at Ohio Journal of Science*.

Bernstein, J.M., Francioli, Y.Z., Schield, D.R., Adams, R.H., Perry, B.W., **Farleigh, K.**, ... & Castoe, T.A. Disentangling a genome-wide mosaic of conflicting phylogenetic signals in Western Rattlesnakes. *In review at Molecular Phylogenetics and Evolution*.

Murphy, M.O., **Farleigh, K.**, Jezkova T., Peterman, W.E., Boone, M.D. Land-cover patterns differentially affect population genetic structure and connectivity of two anurans. *In review at Landscape Ecology*.

Schild, D.R., Carter, J.K., Alderman, M.G., **Farleigh, K.**, Highland, D.K., Safran, R.J. Selection shapes repeated genomic landscapes of divergence across the speciation continuum in swallows (*Hirundo*). *In review at Molecular Ecology*.

PRESENTATIONS

- 2024 **Farleigh, K.**, Exploring the genetic basis of local adaptation. Oral Presentation. Dissertation Defense. Miami University. Oxford, OH.
- 2024 **Farleigh, K.**, & Jezkova, T., Local adaptation in desert horned lizards (*Phrynosoma platyrhinos*). Oral Presentation. Herpetology (BIO 409). Miami University. Oxford, OH.
- 2023 Jezkova, T., & **Farleigh, K.**, Genomic approaches to detecting signals of local adaptation. Oral Presentation. Central Ohio Phylogeography Extravaganza. Columbus, OH.
- 2022 Koochekian, N., Ascanio, A., **Farleigh, K.**, Card, D.C., Schield, D.R., Castoe, T.A., Jezkova, T. A chromosome-level genome assembly and annotation of the desert horned lizard, *Phrynosoma platyrhinos*, provides insight into chromosomal rearrangements among reptiles. Oral Presentation. Evolution 2022.

- 2022 **Farleigh, K.,** & Jezkova, T. Genetic signals of local adaptation in a desert rodent that occupies diverse climates and habitats. *Evolution 2022*. Oral Presentation. Virtual.
- 2022 **Farleigh, K.,** & Jezkova, T. Exploring signatures of differential selection and local adaptation across climate and habitat in the chisel-toothed kangaroo rat (*Dipodomys microps*). Oral Presentation. International Biogeography Society Meeting. Virtual.
- 2021 Koochekian, N., Ascanio, A., **Farleigh, K.,** Card, D.C., Schield, D.R., Castoe, T.A., Jezkova, T. The genome of *Phrynosoma platyrhinos*. Oral Presentation. Virtual Evolution 2021. Virtual.
- 2021 **Farleigh, K.,** & Jezkova, T. Identifying genomic adaptations in *Dipodomys microps*. Oral Presentation. American Society of Mammalogists 100th Annual Meeting. Virtual.
- 2021 **Farleigh, K.** Identifying genomic adaptations in *Dipodomys microps*. Oral Presentation. Miami University Ecolunch. Virtual.
- 2020 Jezkova, T., & **Farleigh, K.** Detecting genomic signals of population adaptation. City University of New York Bioinformatics Bootcamp for Ecology and Evolution. Oral Presentation. Virtual.
- 2019 Blair, C., Finger, N., Jezkova, T., François, O., Williams, D., Leachè, A.D., Charran, T., **Farleigh, K.,** Bracken, J.T. Genomic data reveal deep lineage divergence and molecular adaptation in the Texas horned lizard (*Phrynosoma cornutum*), Poster Presentation. Annual Evolution Meeting. Providence, RI.
- 2019 **Farleigh, K.,** & T. Jezkova. Identifying genomic adaptations to diverse environments in the Chiseled-Toothed Kangaroo Rat (*Dipodomy microps*). Oral presentation. American Society of Mammalogists 99th Annual Meeting. Washington D.C.
- 2018 **Farleigh, K.,** Ignoffo, T., & W.J. Kimmerer. Variability in development rate within and between clutches from individual females copepods (*Pseudodiaptomus forbesi*). Oral Presentation. Capital University Symposium for Undergraduate Research. Columbus, OH.
- 2018 **Farleigh, K.,** & C.S. Anderson. Population Genetics and Migration of *Peromyscus leucopus*, a Lyme disease reservoir species. Poster Presentation. Capital University Symposium for Undergraduate Research. Columbus, OH.

- 2018 **Farleigh, K.,** & C.S. Anderson. Population Genetics and Migration of *Peromyscus leucopus*, a Lyme disease reservoir species. Poster Presentation. Ohio Academy of Science (OAS) 127th Annual Meeting. Bowling Green, OH.
- 2018 **Farleigh, K.,** & C.S. Anderson. Conservation genetics and migration of Lyme disease reservoir species. Poster Presentation. National Conference on Undergraduate Research. Edmond, OK.
- 2018 **Farleigh, K.,** & C.S. Anderson. Bioinformatics in Conservation of Lyme disease reservoir species *Peromyscus leucopus*. Poster Presentation. Ohio Fish and Wildlife Management Association Conference. Columbus, OH.
- 2017 **Farleigh, K.,** Ignoffo, T., & W.J. Kimmerer. Variability in development rate within and between clutches from individual females copepods (*Pseudodiaptomus forbesi*). Poster Presentation. Coastal and Estuarine Research Foundation Biennial Convention. Providence, RI.
- 2017 **Farleigh, K.,** Ignoffo, T., & W.J. Kimmerer. Variability in development rate within and between clutches from individual females copepods (*Pseudodiaptomus forbesi*). Oral Presentation. Romberg Tiburon Research Symposium. San Francisco, CA.
- 2017 **Farleigh, K.,** Ignoffo, T., & W.J. Kimmerer. Variability in development rate within and between clutches from individual females copepods (*Pseudodiaptomus forbesi*). Oral Presentation. Summer Research Symposium at San Francisco State University. San Francisco, CA.
- 2017 **Farleigh, K.,** & C.S. Anderson. Genetic estimates of migration of white-footed mice (*Peromyscus leucopus*) between two habitats at Primmer Outdoor Learning Center. Poster Presentation. Capital University Symposium for Undergraduate Research. Columbus, OH.
- 2017 **Farleigh, K.,** Mcknight, M., Rios, B., & K. Cheesman. Nitrate Consumption of *Chlorella vulgaris* and *Ulothrix*. Poster Presentation. Capital University Symposium for Undergraduate Research. Columbus, OH.

GRANTS AND AWARDS

- 2024 NSF DBI-2409958 – Postdoctoral Research Fellowship in Biology: *Investigating contact zones to understand the genomic and environmental underpinnings of reproductive isolation and adaptive introgression* (\$240,000)
- 2023 Dissertation Scholarship – Miami University (\$11,000)
- 2022 Thesis and Dissertation Research Support – Miami University: *Identifying genomic adaptations of Ambystoma salamanders using whole exome sequencing* (\$600)

- 2020 Theodore Roosevelt Memorial Grant Program – American Museum of Natural History: *Identifying genomic adaptations to diverse climates and habitats in Dipodomys microps* (\$2,000).
- 2020 NSF Graduate Research Fellowship Program: *Identifying genomic adaptations to diverse climates and habitats in Dipodomys microps populations* (\$147,000).
- 2018 Diversity Enhancement Pathway (DEP) Graduate Assistantship
- 2018 Graduate School Scholar Assistantship
- 2018 Magna Cum Laude
- 2017 Boyd Fund Memorial Grant – Capital University: *Bioinformatics in Conservation of Lyme disease reservoir species Peromyscus leucopus* (\$1,000).
- 2017 Beta Beta Beta Research Grant: *Bioinformatics in Conservation of reservoir species Peromyscus leucopus* (\$500).
- 2017 NSF REU Travel Grant: *Variability in development rate within and between clutches from individual female copepods (Pseudodiaptomas forbesi)* (\$1,000).
- 2017 President’s List, Capital University
- 2014-2017 Capital Grant Award
- 2014-2017 Presidential Scholarship
- 2014-2017 Discover Cap Grant
- 2014-2017 Rev. Rufus Tarrant Grant
- 2014-2017 HWCIA Scholarship
- 2014-2016 Dean’s List, Capital University

SOFTWARE AND DATA REPOSITORIES

PopGenHelpR (<https://kfarleigh.github.io/PopGenHelpR>):

An R package to estimate commonly used population genomic statistics and to generate publication quality figures.

HybridFindR (<https://github.com/kfarleigh/HybridFindR>):

An R package to detect signals of differential introgression in hybrid individuals (see publication #7).

GEApermutation (<https://github.com/kfarleigh/GEApermutation>)

A statistical test to identify differential patterns of local adaptation linked to environmental conditions (see publication #6).

Bioinformatics Bootcamp 2020 (https://github.com/kfarleigh/BioinformaticsBootcamp_2020):

A tutorial to perform genome-environment association analysis using data published in Farleigh et al., (2021; see publication #3). This tutorial was presented at the City University of New York Bioinformatics Bootcamp in the Summer of 2020.

Moments (<https://github.com/kfarleigh/Moments>):

Python scripts and demographic models used to model the demographic history of 3 and 4 populations. Models were originally published in Farleigh et al., (2021; see publication #3).

STUDENT ADVISING AND TRAINING

As a Ph.D. student in the laboratory of Dr. Jezkova at Miami University, I assisted Dr. Jezkova in mentoring eight undergraduate researchers and one high school researcher. I have trained students in molecular laboratory techniques, including parts of next-generation library construction, and have trained students in bioinformatic techniques as well as the use of Geographic Information Systems (GIS) programs.

TEACHING EXPERIENCE

Instructor Summer, 2023

Lambda Biological Data Analysis Workshop – Miami University, Oxford, OH
 Instructor for Genetic Data with R, focusing on population genomics, phylogenetics, and differential gene expression.

Assistant Instructor Summer 2019, 2021

Computer Science in Modern Biology – Miami University, Oxford, OH
 Assistant instructor for introduction to R and data visualization classes.

Instructor Summer 2020

Bioinformatics Boot Camp for Ecology and Evolution – The City University of New York, New York, NY
 Instructor for a tutorial demonstrating how to use genetic and environmental data to perform genome-environment association analyses.

Graduate Teaching Assistant Fall 2018

Miami University, Oxford, OH
 Laboratory instructor for semester long course **Biological Concepts: Ecology, Evolution, Genetics, and Diversity** (BIO 115).

PROFESSIONAL SOCIETIES

Member Beta Beta Beta, National Biological Honor Society
 Member Society for the Study of Evolution

SERVICES

2024 Reviewer, NSF GRFP Speed Dating, University of Virginia
 2017-2018 Treasurer, Beta Beta Beta, Capital University
 2018 Participant, Student Leadership Conference, Capital University
 2017 Presenter, Science Visit Day, Capital University
 2017 Judge, Horizon Science Academy Science Fair
 2017 Panelist, Capital University Student Science Opportunities Panel
 2017 Student Coordinator, Capital University Primmer Property Cleanup and BBQ
 2017 Beta Beta Beta National Biological Honor Society, Capital University

2017 Volunteer, Relay for Life, Capital University

SKILLS AND LANGUAGES

R: High proficiency;

- Datacamp certified Data Scientist in R
- Ability to develop and publish packages to CRAN
- Ability to implement standard and advanced statistical processes
- Machine Learning (Supervised, Unsupervised, Reinforcement)
- Data Cleaning, Mining, and Modeling
- GIS Mapping
- Function Writing
- Data Visualization

Python: Working proficiency;

- Ability to implement standard statistical processes
- Function Writing
- Data Cleaning, Mining, and Modeling
- Data Visualization

Git: Working proficiency;

- Version control

Bash: Working proficiency;

- Shell scripting

ArcGIS: High proficiency;

- Spatial Analysis – proficient

Microsoft: High proficiency;

- PowerPoint

- Word

- Excel

Spanish: Beginner
