Joseph McGirr, PhD

Evolutionary Biologist
Postdoctoral Researcher

email: josephmcgirr@gmail.com
twitter: @mcgirr_joe
website: joemcgirr.github.io
github: joemcgirr

Summary

I'm a bioinformatics scientist specializing in genetics and population biology. I have a Ph.D. in biology from the University of North Carolina and have published research in evolutionary genetics and bioinformatics in prominent journals including *Molecular Biology and Evolution, Evolution Letters,* and *Molecular Ecology*. My projects combine evolutionary theory with next generation sequencing data to answer questions at the intersection of basic and applied research.

Education

University of North Carolina, Chapel Hill	2015-2020	Ph.D. Biology
University of Colorado, Colorado Springs	2010-2014	B.S. Biology *magna cum laude*

Experience

2020 - **Postdoctoral Researcher, Whitehead Lab, Dept. of Environmental Toxicology, University of California, Davis, CA**

- Conducted temporal and spatial genomic contrasts to understand population collapse and recovery.
- Identified cross-species differential gene expression in response to osmotic stress.

2015-2020 **PhD Student, Martin Lab, Dept. of Biology, University of North Carolina, Chapel Hill, NC**

- Research on the genetic basis of adaptive traits and reproductive isolation in young species.
- Identification of novel candidate genes influencing craniofacial development.
- Discovered alleles under divergent selection contributing to gene misregulation in hybrids.
- Taught labs in evolution, animal behavior, anatomy, and course-based undergraduate research (CURE).

2011-2014 **Undergraduate Research Assistant, Bono Lab, Dept. of Biology, University of Colorado, Colorado Springs, CO**

- Research on early stages of speciation in *Drosophila*.

Selected Publications

full list at: https://scholar.google.com/citations?user=BaXHXekAAAAJ&hl=en

Few fixed variants between trophic specialist pupfish species reveal candidate *cis*-regulatory alleles underlying rapid craniofacial divergence. McGirr JA and Martin CH. 2020. *Molecular Biology and Evolution.* https://doi.org/10.1093/molbev/msaa218

Ecological divergence in sympatry causes gene misregulation in hybrids. McGirr JA and Martin CH. 2020. Molecular Ecology. https://doi.org/10.1111/mec.15512

Parallel evolution of gene expression between trophic specialists despite divergent genotypes and morphologies. McGirr JA and Martin CH. *Evolution Letters.* https://doi.org/10.1002/evl3.41

Funding and Awards

Triangle Center for Evolutionary Medicine Graduate Fellowship. 2018-2019

Rosemary Grant Travel Award, Society for the Study of Evolution. 2017

L.I. Gilbert Travel Award, University of North Carolina Chapel Hill. 2017.

Best Graduate Student Presentation, Southeastern Population Ecology and Evolutionary Genetics Conference. 2018.

Skills

Code: R, python, bash.

Bioinformatics: Illumina whole genome and transcriptome alignment, annotation, and SNP calling with BWA, STAR, Trinity, GATK, samtools, ANGSD and R-Bioconductor packages.

Computing: SLURM, Amazon EC2, LSF, git.

Statistics: Linear models, mixed models, classical stats, GWAS, genetic demographic modeling.

Bench: Designed and performed CRISPR/Cas9 gene editing experiments.