# KYLE T. DAVID

101 Life Sciences Building, Auburn University
kzd0038@auburn.edu
kyletdavid.github.io
312-860-2058

## Education

**PhD Student - Halanych Lab, Auburn University** 2017-present
Department of Biological Sciences

**BS Biology/Marine Science - University of Miami** 2012-2016
Rosenstiel School of Marine & Atmospheric Science, Chemistry Minor

## Publications

Li, Y., Tassia, M.G., Waits, D.S., Bogantes, V. E., **David, K.T.**, & Halanych, K.M. (2019) Genomic adaptations to chemosymbiosis in the deep-sea seep-dwelling tubeworm Lamellibrachia luymesi. *BMC Biol* 17, 91 (2019)

**David, K.T.**, Wilson, A. E., & Halanych, K. M. (2019). Sequencing Disparity in the Genomic Era. *Molecular Biology and evolution*. [Featured Cover Article]

**David, K. T.**, & Halanych, K. M. (2017). Mitochondrial genome of *Dinophilus gyrociliatus* (Annelida: Dinophilidae). *Mitochondrial DNA Part B*, 2(2), 831-832.

McMahan, C. D., Ginger, L., Cage, M., **David, K. T.**, Chakrabarty, P., Johnston, M., & Matamoros, W. A. (2017). Pleistocene to holocene expansion of the black-belt cichlid in Central America, *Vieja maculicauda* (Teleostei: Cichlidae). *PLOS ONE*, 12(5), e0178439.

**David, K. T.**, Tanabe, P., & Fieber, L. A. (2016). Resource availability drives mating role selection in a simultaneous hermaphrodite *Aplysia californica*. *The Biological Bulletin*, 231(3), 199-206.

## Awards and Honors

**NSF Graduate Research Fellowship** - $138,000 2019 - 2022

**Wake Award for Best Student Oral Presentation** - $150 2019

**Auburn Cellular & Molecular Biosciences Fellowship** - $22,500 2017 - 2018

**Departmental Honors** 2016

**Presidential Scholarship** - $64,000 2012 - 2016

**Honor Roll** 2012 - 2016

**Dean's List** 2012 - 2016

## Presentations (Presented by K. T. David unless otherwise noted)

Use of Genomics Technologies to Explore Adaptations to Chemosymbiosis in the Deep-Sea Seep-Dwelling Siboglinid (Annelida) Tubeworms. Halanych, K. M., Li, Y., Tassia, M. G., Waits, D. S., Bogantes, V. E., **David, K. T.** Talk presented by K. M. Halanych at *AGU* Fall Meeting in San Francisco, CA. December 2019.

Sequencing Disparity in the Genomic Era. **David, K.T.**, Wilson, A. E., & Halanych, K. M. Talk presented at the *Evolution* meeting in Providence, Rhode Island. June 2019.

Another Story of Database Bias: Detecting Protein Domains Beyond Biomedical Model-Species. Tassia, M. G., **David, K. T.**, Halanych, K. M. Talk presented by M. G. Tassia at the *Evolution* meeting in Providence, Rhode Island. June 2019.

Much Ado About Orthologs: Consequences of Duplication and Speciation in Gene Evolution. **David, K. T.**, Oaks, J. R., Halanych, K. M. Talk presented at the *Society of Integrative and Comparative Biology* meeting in Tampa, Florida. January 2019.

Orthologs vs. Paralogs, What's the Difference? **David, K. T.**, Oaks, J. R., Halanych, K. M. Talk presented at the *Society of Systematic Biologists* standalone meeting in Columbus, Ohio. June 2018.

Mating Role Choice in a Simultaneous Hermaphrodite. **David, K. T.**, Tanabe, P., & Fieber, L. A. Poster presented at the *Undergraduate Research, Creativity, and Innovation Forum* in Miami, Florida. June 2016.

## Research Experience

**Kenneth M. Halanych Lab - Auburn University** 2017 - present

Comparative phylogenomics and the evolution of gene duplicates. Leveraging bioinformatic methods and high-throughput sequence data to develop methods and explore trends across the animal tree of life, with a focus on gene duplication and polyploidization events.

**Jamie R. Oaks Lab Rotation - Auburn University** 2018

Testing the ortholog conjecture. Using custom bioinformatic scripts and pipelines this project explored divergence between orthologs and paralogs through models of gene evolution.

**Caleb McMahan Lab - Field Museum of Natural History** 2016 - 2017

Phylogenetic and biogeographical analyses of diadromous fishes utilizing museum collections.

**Douglas L. Crawford & Marjorie Oleksiak Labs - University of Miami** 2015 - 2016

Used an adapted genotyping by sequencing (GBS) protocol to examine species and population structure between the two coral morphospecies across regions of high and low upwelling.

**Lynne A. Fieber Lab - University of Miami** 2013 - 2016

Independently designed and ran a senior thesis on mating role selection in the California Sea Hare. Collected data on food intake, growth, egg yield, fertilization, as well as records of sexual history for a cohort of 22 animals for ~200 days over the course of their mature lives.

**Galápagos Study Abroad - University Miami** 2015

Five accelerated upper-level fieldwork intensive courses concerning relevant scientific issues surrounding the Galápagos as well as its local ecology, including a research project on shoal dynamics in the Panamic Sergeant Major.

# Skills

## Computational

Proficiency in Julia, Python, R, Bash

Phylogenomics: Genome and transcriptome alignment, assembly, translation, and annotation, homology/orthology inference, tree building, phylogenetic comparative methods, biological databases

Population Genomics: SNP processing, population delimitation, variant calling

## Lab

DNA/RNA extraction, PCR, nanodrop/Qubit quantification, gel electrophoresis

Library prep for high-throughput and Sanger sequencing

Experience with preserving, cataloguing, and extracting tissue and DNA from museum collections, including historical (100+ year old) specimens

## Field

Fieldwork experience in South Florida, the Caribbean, and the Galápagos islands

Sampling with quadrats and transects, collection *via* seining, cast netting, and straining

Extensive experience working with freshwater and saltwater aquarium systems from 10-150 gallon single tank setups to large scale fishery and hatchery operations

Advanced SCUBA certified with nitrox, 50+ hours

# Teaching

**Evolutionary Biology Guest Lecturer - Alabama Prison Arts + Education Project** 2019

Prepared and presented a 2.5hr lecture on metazoan diversity and phylogenetics to a class of inmates at Staton Correctional Facility as part of Auburn University's Alabama Prison Arts + Education Project.

**Organismal Biology Teaching Assistant** 2019

Managed five weekly lab sections for Organismal Biology (BIOL 1031). Presented weekly lectures, facilitated in-lab exercises, proctored and graded entrance and exit exams for each section in addition to lab midterms and finals.

**Science Tutor** 2016 - 2017

Certified tutor for high school and college students in a variety of science fields, specializing in evolutionary biology.

# Service & Outreach

**Skype a Scientist** 2018 - present

Engage in 30-60 minute Q&A sessions with k-12 classrooms 4-8 times each semester. Give students the opportunity to get to know a "real scientist" and ask questions.

**Auburn University Museum of Natural History** 2017 - Present

Participate in several engagement opportunities through the museum including open-houses and outreach events with underprivileged schools. Display specimens and engage visitors with questions and informative talks.

**Curious Curators Camp** 2019

Counselor for 5th-6th grade summer camp that teaches the importance of natural history museums. Oversaw educational exercises and activities in addition to supervising "collection" trips in the field, exploring local swamps, streams, forests, and grasslands.

**Field Museum of Natural History Outreach** 2016 - 2017

Participated in "Talk to a Scientist Hour" and "Meet a Scientist" programs at the Field Museum's DNA Discovery Center, educating tour groups and the general public on the fundamentals of molecular biology as well as my own research.

**Galápagos Tortoise Breeding Center** 2015

Fed, cleaned, and otherwise cared for a variety of captive-bred giant Galapágos tortoise subspecies for eventually repatriation back into the wild. Volunteered mornings while abroad in the Galapágos.

**University of Miami Aquarium Club** 2013 - 2016

As president, managed dozens of freshwater and marine systems campus-wide as well as provided our 70+ members with the means to care for their own aquariums. Responsible for all the club's major events and projects including club trips to aquariums all across the country. Also managed social media profiles and email correspondence.

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References Available Upon Request

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