Randy Klabacka | curriculum vitae

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Education

Ph.D. in Biological Sciences 2022 Department of Biological Sciences, Auburn University Advisors: Drs. Tonia Schwartz & Jamie Oaks B.S. in Biology 2016 Department of Biology, Brigham Young University Advisors: Drs. Jack Sites & Chad Hancock **Professional Appointments** Assistant Professor 2023-present Biological Sciences Department, Utah Tech University Grants, Fellowships, and Scholarships 2023: UT Faculty Research Fellowship) \$7.000 Bioinformatic examination of genome-wide expression and sequence variation in hybrid asexual lizards 2020: EECG Research Award (American Genetics Association) \$8,000 Genomic and bioenergetic costs of asexuality in a vertebrate system (Aspidoscelis) 2017: CMB Peaks of Excellence Research Fellowship (Auburn University) \$4,500 Mitonuclear distancing: The baggage of an asexual reproductive strategy 2017: Meredith Birchfield Endowed Fund for Excellence (Auburn Univ Museum of Natural History) \$1500 Examining species boundaries in *Draco maculatus* **2016**: Office of Research & Creative Activities Grant (BYU) \$1,500 Phylogeny and species boundaries in spotted flying lizards (*Draco maculatus*) 2012-15: Undergraduate Academic Scholarships (BYU) \$11.987 **Awards** \$200 2019: 1st Place - Henri Seibert Competition Systematics & Evolution Category (SSAR) Riverine barriers as potential drivers of biodiversification in *Draco maculatus* 2019: Trees in the Desert Workshop (NSF - University of Arizona) \$1.000 funded workshop (covering travel, lodging, food, and workshop \$300 2019: COSAM Travel Award (Auburn University) Funding to present research at 9th World Congress of Herpetology 2017: NSF Travel Grant (Society of Systematics Biology Meeting) \$500 Funding to present research at 2017 SSB meeting \$300 2015: 3rd Place - HBLL College of Life Sciences Poster Competition (BYU) Phylogeny and species boundaries in spotted flying lizards (*Draco maculatus*)

2015: College of Life Sciences Dean's List (BYU)

2014: REU Supplement Recipient (BYU)

\$3,000

Phylogeny and biogeography of New World leaf-toed geckos (Phyllodactylus)

Peer-reviewed Publications

- Warner, Daniel A, Connor Kelly, Jenna E Pruett, Amélie Fargevieille, and Randy L Klabacka (2023). "Fluctuating environments hinder the ability of female lizards to choose suitable nest sites for their embryos." Behavioral Ecology and Sociobiology 77.3, p. 32.
- Beatty, Abby E, Emily P Driessen, Amanda D Clark, Robin A Costello, Sharday Ewell, Sheritta Fagbodun, Randy L Klabacka, Todd Lamb, Kimberly Mulligan, Jeremiah A Henning, et al. (2023). "Biology Instructors See Value in Discussing Controversial Topics but Fear Personal and Professional Consequences." CBE—Life Sciences Education 22.3, ar28.
- Tracy, Claire B., Emily Driessen, Abby E. Beatty, T. Lamb, Jenna E. Pruett, Jake Botello, Cara Brittain, Ísada Claudio Ford, Chloe C. Josefson, **Randy L Klabacka**, Tyler Smith, Ariel Steele, Min Zhong, Scott Bowling, Cindy Dixon, and Cissy Ballen (2022). "Why students struggle in undergraduate biology: sources and solutions." accepted in CBE-Life Sciences Education.
- Klabacka, Randy L, Hailey A Parry, Kang Nian Yap, Ryan A Cook, Tori A Herron, L Miles Horne, Jose A Maldonado, Jamie R Oaks, Andreas N Kavazis, Matthew K Fujita, and Tonia S Schwartz (2022). "Reduced mitochondrial respiration in hybrid asexual lizards." American Naturalist. (undergrad).
- Grismer, Jesse, Peter Scott, Erin Toffelmier, Brian Hinds, Randy L Klabacka, Glenn Stewart, Virginia White, Jamie Oaks, and H. Bradley Shaffer (2022). "Genomic data reveal local endemism in Southern California Rubber Boas (Serpentes: Boidae, *Charina*) and the critical need for enhanced conservation actions." accepted in Molecular Phylogenetics and Evolution.
- Westfall, Aundrea K, Rory S Telemeco, Mariana B Grizante, Damien S Waits, Amanda D Clark, Dasia Y Simpson, Randy L Klabacka, Alexis P Sullivan, George H Perry, Michael W Sears, et al. (2021). "A chromosome-level genome assembly for the Eastern Fence Lizard (*Sceloporus undulatus*), a reptile model for physiological and evolutionary ecology." *GigaScience*.
- Klabacka, Randy L, Perry L Wood Jr, Jimmy A McGuire, Jamie R Oaks, L Lee Grismer, Jesse L Grismer, Anchalee Aowphol, and Jack W Sites Jr (2020). "Rivers of Indochina as potential drivers of lineage diversification in the spotted flying lizard (*Draco maculatus*) species complex." *Molecular Phylogenetics and Evolution*, p. 106861.
- Gangloff, Eric J, Tonia S Schwartz, Randy L Klabacka, Natalie Huebschman, Ang-Yu Liu, and Anne M Bronikowski (2020). "Mitochondria as central characters in a complex narrative: Linking genomics, energetics, and pace-of-life in natural populations of garter snakes." *Experimental Gerontology*, p. 110967.
- Grismer, L Lee, Jr PL Wood, Shahrul Anuar, Marta S Grismer, ES Quah, Matthew L Murdoch, Mohd Abdul Muin, Hayden R Davis, Cesar Aguilar, Randy L Klabacka, et al. (2016). "Two new Bent-toed Geckos of the *Cyrtodactylus pulchellus* complex from Peninsular Malaysia and multiple instances of convergent adaptation to limestone forest ecosystems." *Zootaxa* 4105.5, pp. 401–429.
- Davis, Hayden R, L Lee Grismer, Randy L Klabacka, Mohd Abdul Muin, Evan SH Quah, Shahrul Anuar, Perry L Wood Jr, and JW Sites Jr (2016). "The phylogenetic relationships of a new Stream Toad of the genus *Ansonia* Stoliczka, 1870 (Anura: Bufonidae) from a montane region in Peninsular Malaysia." *Zootaxa* 4103.2, pp. 137–153.

Manuscripts in-review and in-prep

Klabacka, Randy, Anne Bronikowski, Suzanne McGaugh, Dawn Reding, Daniel Nettleton, Andrew Lithio, Laurie Stevison, Jessica Judson, and Tonia Schwartz (2024). "Evolution of targeted gene networks in divergent garter snake ecotypes." *in-prep for Aging Cell*.

Christensen, Baylee, Reagan McKee, Dante Celani, Candice Johnson, and Randy L Klabacka (2024). "CatPop: A software package to statistically quantify divergence between biological categories with underlying population structure." *in-prep for Evolutionary Bioinformatics*. (undergrad).

Invited Seminars

2021: Workshop on Fostering Idealogical Awareness

Auburn University

Teaching evolution to students of faith: How instructors can help students overcome barriers

2019: Museum of Natural Science Seminar Series

Louisiana State University

Riverine barriers as drivers of biodiversification in terrestrial fauna of Southeast Asia

Presentations

Klabacka, Randy L, Hailey Parry, Jeff Yap, Ryan Cook, Tori Herron, L Miles Horne, José Maldonado, Guillermo Álvarez, Andreas N Kavazis, Jamie R Oaks, Matthew K Fujita, and Tonia S Schwartz (n.d.). "Reduced endurance and mitochondrial respiration in hybrid asexual lizards (genus: Aspidoscelis)." In: SICB 2021 (). Virtual Conference – talk (undergrad).

Johnson, Candice, Dante Celani, Seun Onileowo, and Randy L Klabacka (2023). "The effect of read-to-reference evolutionary relatedness on bioinformatic mapping efficiency of genomic sequencing data." In: EVOLUTION 2023. Albuquerque, NM – poster (undergrad).

Christensen, Baylee, Reagan McKee, Dante Celani, Candice Johnson, Vicente Fernández Lara, Kasia Poulson, Anne M Bronikowski, Suzanne E McGaugh, Dawn Reding, Andrew Lithio, Dan Nettleton, Laurie S Stevison, Jessica Judson, Tonia S Schwartz, and Randy L Klabacka (2023). "Comparing genetic divergence between biological groups using pair-wise population data, combinatorics, and a permutation test." In: EVOLUTION 2023. Albuquerque, NM – poster (undergrad).

Ryland R Day, Syrus W D Miner, Adam P Dimaio, Justin P LeClair, T Smith, Aaron P Davis, and Randy L Klabacka (2023). "An inertial measurement unit enhanced knee brace working to improve outcomes after surgery." In: UCUR 2023. University of Utah; Salt Lake City, UT – poster (undergrad).

Klabacka, Randy L, Anne Bronikowski, Suzanne McGaugh, Dawn Reding, Daniel Nettleton, Andrew Lithio, Laurie Stevison, Jessica Judson, and Tonia Schwartz (2021). "Genomic and phenotypic evolution of targeted genenetworks in divergent garter snake ecotypes." In: *EVOLUTION 2021*. Virtual Conference – talk.

Klabacka, Randy L, Hailey Parry, Jeff Yap, Ryan Cook, Tori Herron, L Miles Horne, José Maldonado, Guillermo Álvarez, Andreas N Kavazis, Jamie R Oaks, Matthew K Fujita, and Tonia S Schwartz (2020). "The powerhouse of asexual cost? Endurance and mitochondrial efficiency in parthenogenetic whiptail lizards (genus Aspidoscelis)." In: 9th Annual World Congress of Herpetology. University of Otago; Dunedin, NZ – talk (undergrad).

Klabacka, Randy L, P L Wood Jr, Jimmy A McGuire, Jamie R Oaks, L Lee Grismer, Jesse L Grismer, Anchalee Aowphol, and Jack W Sites Jr (2019). "Riverine barriers as potential drivers of biodiversification in the *Draco maculatus* species complex of Indochina." In: *Joint Meeting of*

Ichthyologists and Herpetologists. Snowbird, UT – talk *1st place in Henri Seibert Competition (Systematics & Evolution Category).

- Schwartz, Tonia S, Dawn Reding, **Randy L Klabacka**, Stephen Sephick, Laurie Stevison, and Anne M Bronikowski (2019). "Population genetics of the electron transport chain in snake populations exhibiting divergent resting metabolic rates." In: *Society for Integrative and Comparative Biology Meeting*. Tampa, FL poster.
- Klabacka, Randy L, José Maldonado, Andreas N Kavazis, Hailey Parry, Jamie R Oaks, Matthew K Fujita, and Tonia S Schwartz (2019). "Comparative examination of mitochondrial function in parthenogenetic whiptail lizards genus (*Aspidoscelis*)." In: *American Genetics Association Presidential Symposium*. Portland, OR poster.
- Cook, Ryan, Randy Klabacka L, Sarin Tiatragul, Gabrielle Ripa, Kayla Wilson, and Jamie Oaks (2018). "Longitudinal examination of lungless salamander species (family Plethodontidae) morphology in Alabama." In: COSAM Research Fair 2018. Auburn University poster (undergrad).
- Klabacka, Randy L, P L Wood Jr, Jimmy A McGuire, Jamie R Oaks, L Lee Grismer, Jesse L Grismer, Anchalee Aowphol, and Jack W Sites Jr (2018). "Bayes factor delimitation supports population structure in Southeast Asian species complex of Agamid lizard." In: Society for Systematic Biologists Meeting. The Ohio State University; Cleveland, OH poster.
- Schwartz, Tonia S, Dawn Reding, Randy L Klabacka, Stephen Sephick, Laurie Stevison, and Anne M Bronikowski (2017). "Targeted sequence capture for functional population genomics of genetic networks: Mapping approaches for non-model organisms." In: *Joint Meeting of Ichthyologists and Herpetologists*. Austin, TX poster.
- Klabacka, Randy L, P L Wood Jr, Jimmy A McGuire, L Lee Grismer, and Jack W Sites Jr (2017). "Speciation or isolated diversification: The hidden variation of *Draco maculatus*." In: *Society for Systematic Biologists Meeting*. Louisiana State University; Baton Rouge, LA talk.
- Klabacka, Randy, P L Wood Jr, and Jack W Sites Jr (2016). "Phylogeny and species boundaries in the "flying dragons" of the *Draco maculatus* species complex (family Agamidae)." In: *Utah Conference on Undergraduate Research*. University of Utah; Salt Lake City, UT poster.
- Klabacka, Randy L, P L Wood Jr, L Lee Grismer, Jimmy A McGuire, and Jack W Sites Jr (2016). "Hidden Dragons: The molecular composition of the *Draco maculatus* species complex." In: *South Eastern Population Ecology and Evolutionary Genetics Meeting*. Madison, FL talk.
- Klabacka, Randy L, P L Wood Jr, and Jack W Sites Jr (2015). "Phylogeny and species boundaries in the "flying dragons" of the *Draco maculatus* species complex (family Agamidae)." In: *HBLL BYU Poster Competition*. Brigham Young University; Provo, UT poster *3rd Place.
- Klabacka, Randy L, César Aguilar, Aaron M Bauer, Alessandro Catenazzi, Eli Greenbaum, Jack W Sites Jr, F Faldez, Perry L Wood Jr, Ryan Wilkes, and Tony Gamble (2015). "Phylogeny and biogeography of New World leaf-toed geckos, *Phyllodactylus* (Phyllodactylidae: Gekkota)." In: *Society for the Study of Amphibians and Reptiles Meeting*. University of Kansas; Lawrence, KA poster.

Mentorship

I have mentored 20 undergraduate students in bioinformatics, field biology, and molecular lab work. Three of these undergraduates published research with me as co-authors. Current positions of these students include veterinary school, hydrology technician, M.S. evol/ecol graduate school, undergraduate research assistant, and working on manuscripts for peer-reviewed publications.

Teaching Experience

| Course Instructor | |
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| • Fall 2023: BIOL 4320: Scripting for Biologists | In-person |
| • Fall 2023: BIOL 3030: Principles of Genetics | In-person |
| o Fall 2023: BIOL 2300: Fundamentals of Bioinform | natics In-person |
| • Summer 2023: BIOL 3030: Principles of Genetics | Online |
| • Spring 2023: BIOL 4310: Advanced Bioinformatic | In-person |
| • Spring 2023: BIOL 3030: Principles of Genetics | Blended |
| • Spring 2022: BIOL 7180: Scripting for Biologists | Online and Synchronous |
| o Fall 2021: BIOL 3000: Genetics | Online and Asynchronous |
| Teaching Assistantships | Instructor(s) |
| • 2021: BIOL 7180: Scripting for Biologists | Jamie Oaks |
| o 2020: BIOL 4020: Vertebrate Biodiversity Lab | Dan Warner |
| o 2020 : BIOL 5740/6740: Herpetology Lab | Jamie Oaks & Dan Warner |
| o 2019: BIOL 4020: Vertebrate Biodiversity Lab | Joshua Hall |
| o 2018: BIOL 5240/6240: Animal Physiology Lab | Ray Henry |
| o 2013-2016: BIO 130 Lab: Principles of Biology | Keoni Kauwe & Byron Adams |
| Guest Lectures | Instructor(s) |
| o 2023: Principles of Biology (BIOL 1610) | Overview of Bioinformatics |
| o 2023: Principles of Biology (BIOL 1610) | Mendel and the Gene Idea |
| o 2023: Principles of Biology (BIOL 1610) | Cell Division |
| o 2021: Mitonuclear Ecology (BIOL 6750) | The evolution of sex |
| o 2021: Scripting for Biologists (BIOL 7180) Crea | ting python classes & using random number generators |
| o 2021: Scripting for Biologists (BIOL 7180) | Implementing regular expressions |
| o 2021: Scripting for Biologists (BIOL 7180) | Introduction to Biopython |
| o 2019 : Vertebrate Biodiversity (BIOL 4020) | Amphibian Life History Strategies |
| o 2018 : Functional Genomics (BIOL 5850/6850) | Using high-throughput sequencing for targeted genes |
| o 2018: Evolution and Systematics (BIOL 3030 | Early evolutionary ideas- Tree thinking |
| o 2016: Principles of Biology | The domains of life |
| o 2016: Principles of Biology | The central dogma of biology |
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Professional Development

o 2023: Microcredential Course: Promoting Active Learning

Completed course in effective teaching practices focused on techniques in active learning. Satisfied expectations
of the course, including successful completion of 6 modules of learning and implementation.

• 2021: Fostering ideological awareness - professional workshop

Organizer: Dr. Abby Beatty

Organizer: ACUE

- Week-long, inter-institutional workshop where collaborators presented research and collaboratively created open-source course modules for contextualizing societal and ethical impacts of applied biology.
- o 2020: Inroduction to Discipline-Based Education Research graduate course Instructor: Dr. Cissy Ballen
 - Semester-long graduate course focused on topics, literature, and methods of discipline-based education research, with an emphasis on active-learning teaching strategies. As part of this course, we published a manuscript on barriers to introductory biology students (see Tracey et al. in Manuscripts In-review section)
- 2018: Engaged and Active Student Learning professional workshop
 Host: AU Biggio Center
 - Half-day workshop , literature, and methods of discipline-based education research, with an emphasis on

active-learning teaching strategies.

Research Assistantships

o 2013-16: Phylogenetic Systematics Jack Sites

• 2013-16: Metabolic Physiology and Bioenergetics

Field Experience

| 2021: Assisted with animal capture and respirometry of Thamnophis elegans in CA | |
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| 2021: Assisted with animal capture processing of 8 Anolis species in FL | |
| 2020: With team of 3 collected 200 live Anolis sagrei for lab breeding colony | 2 days |
| 2019: Led team of five in NM and TX and collected 50 live Aspidoscelis of five species | 1 month |
| 2018: Led team of four in NM and TX and collected 210 Aspidoscelis of 12 species | 2 months |
| 2017: Led team of two to validate potential Aspidoscelis collection localities | |
| 2016: Collected various herpetofauna for BYU Bean LS Museum in Thailand and Malaysia | 3 weeks |
| 2015: Collected morphological data from live Crotalus oreganus lutosus | |
| 2014: Participated in neotropical biology and geology field course in Costa Rica | |
| 2013: Counted egg masses & recorded localities for Rana luteiventris habitat restoration | 1 day |

Relevant Research Skills

Computational.

- O Develop genomic pipelines for read cleaning, assembly, mapping, and variant calling
- Implement computational tools for functional genomics (e.g., gene expression), population genetics, and phylogenetics with genomic datasets
- Run scripts on high-performance clusters using slurm and pbs
- o Languages: Python, C++, Bash, R, LaTeX, HTML, git

Molecular.

- Perform DNA sequencing techniques (extraction, optimizing quality/quantity for genomic sequencing, PCR, PCR cleanup, big-dye sequencing, will be performing RNA-seq in 2022)
- Perform mitochondrial isolation, tissue homogenization (for physiology), mitochondrial respirometry, enzyme activity assays, protein assays, and reactive oxygen species assays.

Organismal and Museum Collection

- Capture and formalin fix herpetofauna and maintain ethanol-preserved collection (curate teaching collection while teaching Vertebrate Biodiversity and Herpetology, which contains over 1000 ethanol-preserved fish, amphibians, and reptiles)
- Isolate blood from lizards (using post-orbital cavity) and perform general animal necropsy and dissection, flash-preserving tissues in liquid nitrogen.

Field and Additional

Fluently speak Spanish

Chad Hancock

- Established inter-institutional field research in TX and NM
- Led multiple collection- and research-based field trips in TX, NM, and AZ

Outreach and Community Service

2023: Bioinformatics guest lecture UT STEM Outreach; Hurricane HS Comp Sci class Zion International Program; Japanese visiting students 2023: Bioinformatics Q&A 2023: Museum tour guide Museum of Natural Sciences; Utah Tech University Bi-annual Virgin River Cleanup; UT Biological Sciences Department **2023**: Virgin river litter collector **2020-present**: QuickGRITS podcast: link (available on Spotify) Creator 2022: "Gross Out Camp" Museum Instructor Fresh Air family; Auburn, AL 2020: Chief Science Officers "Zoom In On Science" Guest SciTech Institute; Kenya 2020: Chief Science Officers "Zoom In On Science" Guest SciTech Institute; Sonora, Mexico 2019: Volunteer Field Ornithology TA UTEP-IMRS Field Biology Course 2018: Volunteer Field Herpetology TA UTEP-IMRS Field Biology Course 2016: Reptile and Amphibian Studies Scout Merit Badge Instructor Boy Scouts of America

Department and University Service Positions

2023-present:Bioinformatics Program CoordinatorUtah Tech University2023-present:IACUC MemberUtah Tech University2020-2022:DBS Seminar Committee Grad RepresentativeAuburn University2018-2021:Member of the Snake Response TeamAuburn University2015-16:Co-president/founder of Life Sciences Pre-Graduate Student ClubBYU

Department and University Service Activities

2023: Lead Organizer and Host for Dr. Perry Ridge visit Utah Tech University Forum 2023: Organizer and Panel Member for Grad School Q&A Utah Tech University 2023: Panel Member for Undergraduate Research Trailblazer Connections; UT Welcome Week 2023: Biological Sciences Poster Judge Biannual Poster Competition; UT Biological Sciences Dept 2023: STEM Poster Judge Trailblazer Symposium; Utah Tech University **2022**: DBS Seminar Host Chair - Brandon Ogbunu Visit (Princeton) Auburn University 2022: Natural History Museum Open House Representative Auburn University 2021: Safe techniques for handling snakes: Instructor E. W. Shell Fisheries, Auburn University 2021: DBS Seminar Host Committee Member - Rebecca Tarvin Visit (UC- Berkeley) Auburn University 2019: Grad Representative - Global Change Biology Hiring Committee Auburn University 2019: STEM Discovery Day instructor Auburn University 2018: DBS Seminar Host Chair - Matt Fujita Visit (UT- Arlington) Auburn University 2018: Natural History Museum Open House Representative Auburn University 2018: DBS Seminar Host Chair - Marjorie Oleksiak Visit (U Miami) Auburn University 2017: DBS Seminar Host Committee Member - Peter Andolfatto Visit (Princeton) Auburn University 2017: Natural History Museum Open House Representative Auburn University 2017: DBS Seminar Host Committee Member - Armin Moczek Visit (Indiana Univ) Auburn University 2016: Natural History Museum Open House Representative Auburn University

2015: Host for the BYU-sponsored "Night at the Museum" Monte L. Bean Life Science Museum2014: Tour guide for LSB opening- President's Leadership Council dinner Brigham Young University

Professional Memberships

Society for the Study of Amphibians and Reptiles (SSAR) Society for Integrative and Comparative Biology (SICB) Society of Systematic Biologists (SSB) Society for the Study of Evolution (SSE) American Genetics Association (AGA)

Scholarly Reviews

Molecular Ecology Biological Journal of the Linnean Society Herpetologica Entomology, Ornithology, & Herpetology: Current Research