Randy Klabacka | Curriculum Vitae

Assistant Professor - Utah Tech University, St. George, UT - 435-879-4828

Education

B.S. in Biology

Ph.D. in Biological Sciences

2022

Department of Biological Sciences, Auburn University

Advisors: Drs. Tonia Schwartz & Jamie Oaks

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)

\$4,500

2017: CMB Peaks of Excellence Research Fellowship (Auburn University)

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*

\$1,500

2016: Office of Research & Creative Activities Grant (BYU)

Phylogeny and species boundaries in spotted flying lizards (Draco maculatus)

2012-15: Undergraduate Academic Scholarships (BYU)

\$11,987

Awards

2019: 1st Place - Henri Seibert Competition Systematics & Evolution Category (SSAR)	\$200
Riverine barriers as potential drivers of biodiversification in <i>Draco maculatus</i> 2019 : Trees in the Desert Workshop (NSF - University of Arizona)	\$1,000
funded workshop (covering travel, lodging, food, and workshop 2019 : COSAM Travel Award (Auburn University)	\$300
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	

2015: 3rd Place - HBLL College of Life Sciences Poster Competition (BYU) \$300

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

- * mentored undergraduate student
- 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 Ryan A Cook* Tori A Herron* L Miles Horne* Yap, 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*.
- 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

* mentored undergraduate student

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*.

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

* mentored undergraduate student

Klabacka, Randy L, Hailey Parry, Jeff Ryan Cook* Tori Herron* L Miles Horne* Yap, 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.

Johnson*, Candice, Dante Celani*, Seun Onileowo 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.

Christensen, Baylee*, Reagan McKee*, Dante Celani*, Candice Johnson*, Vicente Fernández Lara*, Kasia Poulsen*, 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.

Day*, Ryland R, 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.

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 Ryan Cook* Tori Herron* L Miles Horne* Yap, 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.

- 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.
- 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./Ph.D. evol/ecol graduate school, undergraduate research assistant, and working on manuscripts for peer-reviewed publications.

Teaching Experience

Course Instructor	
o 2023: BIOL 4320: Scripting for Biologists	In-person
o 2023: BIOL 3030: Principles of Genetics	In-person
o 2023: BIOL 2300: Fundamentals of Bioinformatics	In-person
o 2023: BIOL 3030: Principles of Genetics	Blended
o 2023: BIOL 4310: Advanced Bioinformatics	In-person
o 2022: BIOL 7180: Scripting for Biologists	Online and Synchronous
o 2021 : BIOL 3000: Genetics	Online and Asynchronous
Teaching Assistantships	Instructor(s)
o 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 2017-2019: BIOL 5600/6600: Biomedical Physiolo	gy Lab Mary Mendonca
o 2016 : BIOL 2501: Anatomy and Physiology Lab	Shobnom Ferdous
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
 2021: Mitonuclear Ecology (BIOL 6750) 	The evolution of sex
	ting python classes & using random number generators
 2021: Scripting for Biologists (BIOL 7180) 	Implementing regular expressions
 2021: Scripting for Biologists (BIOL 7180) 	Introduction to Biopython
• 2019 : Vertebrate Biodiversity (BIOL 4020)	Amphibian Life History Strategies
• 2018 : Functional Genomics (BIOL 5850/6850)	Using high-throughput sequencing for targeted genes
• 2018: Evolution and Systematics (BIOL 3030	Early evolutionary ideas- Tree thinking
• 2016: Principles of Biology	The domains of life
 2016: Principles of Biology 	The central dogma of biology

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. Organizer: Dr. Abby Beatty
- 2021: Fostering ideological awareness professional workshop

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

Jon Armbruster and David Laurencio
Jamie Oaks and Tonia Schwartz
Jamie Oaks
Jamie Oaks
Tonia Schwartz
Jack Sites
Chad Hancock

Field Experience

2021 :	Assisted with animal capture and respirometry of <i>Thamnophis elegans</i> in CA	10 days
2021 :	Assisted with animal capture processing of 8 Anolis species in FL	5 days
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	3 weeks
2016 :	Collected various herpetofauna for BYU Bean LS Museum in Thailand and Malaysia	3 weeks
2015 :	Collected morphological data from live Crotalus oreganus lutosus	1 day
2014 :	Participated in neotropical biology and geology field course in Costa Rica	2 weeks
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
- o 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
- Established inter-institutional field research in TX and NM
- o Led multiple collection- and research-based field trips in TX, NM, and AZ

Outreach and Community Service

2023: Bioinformatics guest lecture	UT STEM Out	reach; Hurricane HS Comp Sci class
2023: Bioinformatics Q&A	Zion International	Program; Japanese visiting students
2023: Museum tour guide	Museum of Nat	tural Sciences; Utah Tech University
2023: Virgin river litter collector	Bi-annual Virgin River Cleanup;	UT Biological Sciences Department
2020-present: QuickGRITS podcast:	link (available on Spotify)	Creator
2022: "Gross Out Camp" Museum In	nstructor	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	A	UTEP-IMRS Field Biology Course
2018: Volunteer Field Herpetology Ta	A	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 Coordinator	Utah Tech University
2023-present: IACUC Member	Utah Tech University
2020-2022: DBS Seminar Committee Grad Representative	Auburn University
2018-2021: Member of the Snake Response Team	Auburn University
2015-16: Co-president/founder of Life Sciences Pre-Graduate Student Club	BYU

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	Utai	h Tech University
2023:	Panel Member for Undergraduate Research	Trailblazer Connections; U	T Welcome Week
2023:	Biological Sciences Poster Judge Biannual Pos	ster Competition; UT Biologic	cal Sciences Dept
2023:	STEM Poster Judge	Trailblazer Symposium; Utai	h Tech University
2022:	DBS Seminar Host Chair - Brandon Ogbunu Visit (Pr	inceton) A	Auburn University
2022:	Natural History Museum Open House Representative	A	Auburn University
2021 :	Safe techniques for handling snakes: Instructor	E. W. Shell Fisheries, A	Auburn University
2021 :	DBS Seminar Host Committee Member - Rebecca Tar	rvin Visit (UC- Berkeley) - A	Auburn University
2019 :	Grad Representative - Global Change Biology Hiring C	Committee A	Auburn University
2019 :	STEM Discovery Day instructor	A	Auburn University

CV

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 L	ife Science Museum
2014: Tour guide for LSB opening- President's Leadership Council dinner Bright	am 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