

Wade R. Roberts

Address: University of Arkansas
Department of Biological Sciences
Fayetteville, AR 72701

Email: [wader at uark dot edu](mailto:wader@uark.edu)
Website: <https://wrroberts.github.io>
Github: [wrroberts](https://github.com/wrroberts)

APPOINTMENTS

2018—current **Postdoctoral Fellow**, University of Arkansas
2013—2018 **Graduate Teaching Assistant & Instructor**, Washington State University
2012—2013 **Graduate Research Assistant**, Washington State University

EDUCATION

2018 **Ph.D., Molecular Plant Sciences** Washington State University, Pullman, WA
Dissertation title: Evolutionary genomics of flower diversification in the magic flowers (*Achimenes*, Gesneriaceae).
Advisor: Eric H. Roalson
2012 **B.S., Biology, cum laude** Whitworth University, Spokane, WA
2012 **B.A., Art, cum laude** Whitworth University, Spokane, WA

PUBLICATIONS

(*) indicates equal contribution, (†) indicates student co-author

Peer reviewed:

15. Pinseel E, Ruck EC, Nakov T, Jonsson P, Kourtchenko O, Kremp A, **Roberts WR**, Sjöqvist C, Töpel M, Godhe A, Hahn MW, Alverson AJ. 2025. Local adaptation of a marine diatom is governed by intricate genome-wide changes in diverse metabolic pathways. *Molecular Ecology*. In Press.
14. Alverson AJ, **Roberts WR**, Ruck EC, Nakov T, Ashworth MP, Brylka K, Downey KM, Kociolek JP, Parks M, Pinseel E, Theriot EC, Tye SP, Witkowski A, Beaulieu JM, Wickett NJ. 2025. Phylogenomics reveals the slow burning fuse of diatom evolution. *Proceedings of the National Academy of Sciences*. 122: e2500153122.
 - Media coverage from University of Arkansas Newswire and shared by multiple online science news blogs.
13. **Roberts WR**, Alverson AJ. 2025. Three reference genomes for freshwater diatom ecology and evolution. *Journal of Phycology*. 61: 267-274.
12. **Roberts WR**, Siepielski AM, Alverson AJ. 2024. Genome size predicts diatom abundance in the polar oceans. *PLOS Biology* 22: e3002733.
 - Featured on the cover.
 - Media coverage from University of Arkansas Newswire and shared by multiple online science news blogs.
11. Brylka K[†], Pinseel E, **Roberts WR**, Ruck EC, Conley DJ, Alverson AJ. 2023. Gene duplication, shifting selection, and dosage balance of silicon transporter proteins in marine and freshwater diatoms. *Genome Biology and Evolution* 15: evad212.
10. **Roberts WR**, Ruck EC, Downey KM[†], Pinseel E, Alverson AJ. 2023. Resolving marine—freshwater transitions by diatoms through a fog of gene tree discordance. *Systematic Biology* 72: 984-997.
9. Çiftçi O[†], Alverson AJ, van Bodegom P, **Roberts WR**, Mertens A, van de Vijver B, Trobajo R, Mann D, Pirovano W, van Eijk I, Gravendeel B. 2022. Phylotranscriptomics reveals the reticulate evolutionary history of a widespread diatom species complex. *Journal of Phycology* 58: 643-656.

8. Onyshchenko A[†], **Roberts WR**, Ruck EC, Lewis JA, Alverson AJ. 2021. The genome of a nonphotosynthetic diatom provides insights into the metabolic shift to heterotrophy and constraints on the loss of photosynthesis. *New Phytologist* 232: 1750-1764.
7. Gargas CB*,[†], **Roberts WR***, Alverson AJ. 2020. Genome sequences of bacteria associated with the diatom *Cyclotella cryptica* strain CCMP332. *Microbiology Resource Announcements* 9: e01030-20.
6. **Roberts WR**, Downey KM[†], Ruck EC, Traller JC, Alverson AJ. 2020. Improved reference genome for *Cyclotella cryptica* CCMP332, a model for cell wall morphogenesis, salinity adaptation, and lipid production in diatoms (Bacillariophyta). *G3: Genes, Genomes, Genetics* 10: 2965-2974.
5. **Roberts WR**, Roalson EH. 2020. Co-expression clustering across flower development identifies modules for diverse floral forms in *Achimenes* (Gesneriaceae). *PeerJ* 8: e8778.
4. Kleinkopf JA[†], **Roberts WR**, Wagner WL, Roalson EH. 2019. Diversification of Hawaiian *Cyrtandra* (Gesneriaceae) under the influence of incomplete lineage sorting and hybridization. *Journal of Systematics and Evolution* 57: 561-578.
3. **Roberts WR**, Roalson EH. 2018. Phylogenomic analyses reveal extensive gene flow within the magic flowers (*Achimenes*). *American Journal of Botany* 105: 726-740.
 - Featured on the cover.
2. **Roberts WR**, Roalson EH. 2017. Comparative transcriptome analyses of flower development in four species of *Achimenes* (Gesneriaceae). *BMC Genomics* 18: 240.
1. Roalson EH, **Roberts WR**. 2016. Distinct processes drive diversification in different clades of Gesneriaceae. *Systematic Biology* 65: 662-684.
 - Featured on the cover.

GRANTS AND AWARDS

2020—current	Co-PI: Community Science Program, Joint Genome Institute. [ID 506537100]: 100 Diatom Genomes Project. PI: Thomas Mock.
2016—2018	Co-PI: Doctoral Dissertation Improvement Grant, National Science Foundation. [DEB 1601003]: Evolution of gene expression in floral diversification of Neotropical Gesneriaceae. PI: Eric Roalson. \$19,323.
2016—2017	PI: Elvin McDonald Research Endowment Fund, The Gesneriad Society. Characterizing a red-to-blue flower color transition in <i>Achimenes</i> (Gesneriaceae). \$1,750.
2016	Best Poster Presentation , Inland Northwest Genomics Symposium, Moscow, ID.
2015	Travel Award , Botany conference, American Society of Plant Taxonomists. \$300.
2012	Fellowship: Global Plant Sciences Initiative, Washington State University. \$10,000.
2011	Fellowship: Synthetic Biology Undergraduate Research Experience, National Science Foundation, North Carolina State University. Faculty sponsor: Jenny Xiang. \$6,000.

PRESENTATIONS

Invited Talks:

2024	Arkansas Tech University, Russellville, AR.
2024	Natural Resources Research Institute, Duluth, MN.
2023	Molecular Life of Diatoms conference, San Diego, CA.
2022	University of Arkansas, Fayetteville, AR.
2017	Molecular Plant Sciences seminar series, Washington State University, Pullman, WA.
2016	Molecular Plant Sciences seminar series, Washington State University, Pullman, WA.
May 2025	

Contributed Talks:

- 2025 Ashworth MP, Matibag BD, Majewska R, Frankovich TA, Bosak S, **Roberts WR**, Theriot EC. Variation across the morphology, genes and genome organization of the epizoic diatom *Achnanthes elongata*. [PSA conference, San Juan, PR]
- 2024 **Roberts WR**, Alverson AJ. Genome-scale resolution of cryptic speciation in a cosmopolitan marine diatom. [North American Diatom Symposium, Milford, IA]
- 2024 **Roberts WR**, Alverson AJ. Genome-scale resolution of cryptic speciation in a cosmopolitan marine diatom. [PSA-ISOP-ISEP joint conference, Seattle, WA]
- 2022 **Roberts WR**, Alverson AJ. Genome size evolution in diatoms. [North America Diatom Symposium, Brazil, IN]
- 2021 **Roberts WR**, Alverson AJ. Phylogenomic analysis of the centric diatom order Thalassiosirales based on genome and transcriptome data. [Botany conference, Virtual]
- 2020 **Roberts WR**, Alverson AJ. Evidence for a recent whole-genome duplication in a diatom genome. [Botany conference, Virtual]
- 2019 **Roberts WR**, Alverson AJ. Whole genome shotgun phylogenomics in the Thalassiosirales. [North American Diatom Symposium, Eatonton, GA]
- 2018 **Roberts WR**, Roalson EH. Gene co-expression network connectivity is an important determinant of selective constraint during flower diversification in the magic flowers (*Achimenes*, Gesneriaceae). [Botany conference, Rochester, MN]
- 2018 Kleinkopf J, **Roberts WR**, Wagner WL, Roalson EH. Detecting hybridization in Hawaiian *Cyrtandra* (Gesneriaceae) using genome-wide data. [Botany conference, Rochester, MN]
- 2017 **Roberts WR**, Roalson EH. Genomic evidence for gene flow between species of magic flowers (*Achimenes*, Gesneriaceae). [Evolution conference, Portland, OR]
- 2017 **Roberts WR**, Roalson EH. Dissecting floral diversification in the magic flowers (*Achimenes*, Gesneriaceae). [Biological Sciences Graduate Student Symposium, Washington State University]
- 2015 **Roberts WR**, Roalson EH. Understanding flower diversification in *Achimenes* (Gesneriaceae) using a comparative transcriptomics approach. [Botany conference, Edmonton, AB]

Poster Presentations:

- 2018 **Roberts WR**, Roalson EH. Phylogenomic analyses reveal extensive gene flow within the magic flowers (*Achimenes*, Gesneriaceae).
- Botany conference, Rochester, MN.
 - Academic Showcase, Washington State University.
- 2017 **Roberts WR**, Roalson EH. Exploring phylogenetic relationships in *Achimenes* (Gesneriaceae) using transcriptome sequencing.
- School of Biological Sciences Graduate Student Symposium, Moscow, ID.
 - Plant Sciences Retreat, Washington State University, Pullman, WA.
- 2016 **Roberts WR**, Roalson EH. Using comparative transcriptomics to understand flower diversification: an example from *Achimenes* (Gesneriaceae).
- Inland Northwest Genomics Research Symposium, Moscow, ID. [awarded best poster]
 - Academic Showcase, Washington State University.
 - Plant Sciences Retreat, Washington State University.
- 2015 **Roberts WR**, Roalson EH. Understanding flower diversification in *Achimenes* (Gesneriaceae) using a comparative transcriptomics approach.
- Pan-Am Evo-Devo inaugural conference, Berkeley, CA.

2015

Roberts WR, Roalson EH. Geographic processes drive diversification in different clades of Gesneriaceae.

- School of Biological Sciences Graduate Student Symposium, Moscow, ID.
- Plant Sciences Retreat, Washington State University, Pullman, WA.

2011

Roberts WR, Yi Y, Xiang L, Xiang J. Cloning and evolutionary analysis of *SEPALLATA3* genes in dogwoods—deciphering the genetic links to bract petaloidy.

- North Carolina State University Undergraduate Summer Research Symposium, Raleigh, NC.

TEACHING EXPERIENCE

2013—2018

Graduate Teaching Assistant & Instructor

Washington State University

- Systematic Botany, Biol 332 (3 semesters)
- Introductory Botany, Biol 120 (3 semesters)
- Introductory Biology: Organismal Biology, Biol 106 (5 semesters)

Responsibilities: Instruction and lecturing, course and syllabus design, laboratory prep, writing and grading quizzes and exams, performing course assessments, and providing office hours.

2018

Guest Lecturer

Washington State University

- Systematic Botany (Biol 332)

2012

Supplemental Instructor

Whitworth University

- General Biology I, Biol 140 (1 semester)

Responsibilities: Organized and led weekly study sessions, provided instruction outside the main course, created study guides and worksheets.

2010—2012

Undergraduate Teaching Assistant

Whitworth University

- Genetics, Biol 363 (2 semesters)
- Plant Biology, Biol 153 (2 semesters)

Responsibilities: Laboratory instruction, laboratory prep, homework and exam grading.

OTHER EDUCATION

2025

NVIDIA Workshop: Generative AI with Diffusion Models

Arkansas High Performance Computing Center, University of Arkansas, Fayetteville, AR.

2025

AI literacy with LLMs

Arkansas High Performance Computing Center, University of Arkansas, Fayetteville, AR.

2019

High Performance Computing Workshop

Arkansas High Performance Computing Center, University of Arkansas, Fayetteville, AR.

2017

Software Carpentry Workshop

Center for Environmental Research, Education, and Outreach, Washington State University, Pullman, WA.

2017

Parallel Programming Workshop

Center for Environmental Research, Education, and Outreach, Washington State University, Pullman, WA.

MEDIA COVERAGE

2025

[“Study Resolves Diatom Tree of Life, Could Offer Clues to Earth’s Puzzle”](#), 3 June 2025, Featured in University of Arkansas Newswire [blog].

2024

[“Researchers Make Breakthrough in Understanding Species Abundance”](#), 9 August 2024, Interview for University of Arkansas Newswire [blog].

May 2025

STUDENT MENTORSHIP

Graduate students:

- 2018—2023 **Cory Gargas**, Ph.D., University of Arkansas
Genomics and metagenomics of diatom—bacterial symbioses in *Psammoneis japonica*.
- 2018—2022 **Kala Downy**, Ph.D., University of Arkansas
Genomics and RNA-seq of salinity adaptation in marine and freshwater diatoms.
- 2020—2021 **Kathryn Dupree**, University of Arkansas
Molecular lab work for population genetics of the invasive honeysuckle *Lonicera maackii*.
- 2017—2018 **Joseph Kleinkopf**, M.S., Washington State University
Hybrid capture probe design, molecular lab work, and phylogenomics of Hawaiian *Cyrtandra*.
- 2017 **Raimundo Luciano Soares Neto**, Ph.D., Universidade Federal de Pernambuco
Molecular lab work for a taxonomic revision of Cleomaceae.

Undergraduate students:

- 2024—current **Kara Bledsoe**, University of Arkansas
Community and educational outreach with the myDiatoms citizen science project.
- 2024—current **Kylee Dandini**, University of Arkansas
Morphological and phylogenetic characterization of *Thalassiosira* cf. *cedarkeyensis*.
- 2019—2020 **Andrew Palmer**, University of Arkansas
DNA extractions for population genetics of the invasive honeysuckle *Lonicera maackii*.
- 2019—2020 **Katjana Wiederkehr**, University of Arkansas
Phylogenetics of C4 photosynthesis-associated genes in diatoms, mined from transcriptomes.
- 2017 **Julian Bennett-Ponsford**, Washington State University
Phoenix Conservancy intern, floristics at the Hudson Biological Reserve.
- 2017 **Mara Huang**, Washington State University
Phoenix Conservancy intern, floristics at the Hudson Biological Reserve.
- 2017 **Tia Prudholm**, Washington State University
Phoenix Conservancy intern, floristics at the Hudson Biological Reserve.

OUTREACH AND SERVICE

- 2020—current **myDiatoms (mydiatoms.org)**, citizen science outreach project, University of Arkansas.
- *Develop and lead community and educational outreach events; promote citizen participation in scientific activities related to diatoms and water body health; sample and document diatom biodiversity from water bodies across the United States.*
- 2019—current **Student project judge**, Northwest Arkansas Science and Engineering Fair.
- *Volunteer judge for the microbiology and overall sections; providing feedback and encouragement to local middle and junior high school science students.*
- 2023 **Creator and instructor**, Genome Assembly Workshop, University of Arkansas.
- *Created and led a workshop that provided detailed learning and exposure to current practices in genome assembly and high-performance computing; covered topics ranging from data collection, assembly, and annotation.*
- 2021 **Session chair**, Botany conference, Virtual.
- *Ensured the smooth and timely execution of the session, introducing the speakers, managing the presentation slides, and facilitating the Q&A period.*
- 2019 **Educational outreach volunteer**, Secchi Day at Beaver Lake, Rogers, AR.
- *Provided education about diatoms and water body health to community members.*

May 2025

- 2018 **Volunteer botanist**, Palouse Conservation District, Steptoe Butte State Park, WA.
 ▪ *Provided botanical and native plant expertise to aid community volunteers surveying and identifying the flora of a local state park.*
- 2016—2018 **Faculty representative**, Molecular Plant Sciences Graduate Student Organization.
 ▪ *Advocated for and represented the interests of the graduate students to the faculty; gathered student feedback and raised concerns to ensure student voices were heard.*
- 2017 **Co-lead organizer**, Plant Science Day, Washington State University.
 ▪ *Led the planning, coordination, and organization of the annual community outreach event for children and families to learn about plant science.*
- 2014—2016 **Co-chair**, Palouse Discovery Science Center Committee, Pullman, WA.
 ▪ *Designed and participated in educational outreach events for children in the community to learn about science via hands-on exhibits.*
- 2016 **Exhibit leader**, Plant Science Day, Washington State University.
 ▪ *Provided a hands-on learning exhibit to community members about plant biology.*
- 2015 **Native plant guide**, Palouse Outdoor Science Day, Washington State University.
 ▪ *Led walking tours that taught plant identification of native flora to community members.*
- 2014—2015 **Greenhouse tour guide**, Biology Open House, Washington State University.
 ▪ *Provided tours and information about the plants in the greenhouse to community members.*

Scientific Peer Review:

Biodiversitas Journal of Biological Diversity
Biological Procedures Online
BMC Genomics
Communications Biology
Ecology and Evolution
Environmental Microbiology Reports
Evolutionary Bioinformatics
Evolutionary Ecology
Genes
Marine Life Science & Technology
Mitochondrial DNA Part B: Resources
Molecular Ecology

Molecular Ecology Resources
New Phytologist
PeerJ
PhytoKeys
Plant Cell Reports
Plant Growth Regulation
Plants
PLoS One
Scientific Data
Systematic Biology
Taxon

Research Review Panels: National Science Foundation BIO advisory panel (2023)

Professional Society Membership:

Botanical Society of America
 The Gesneriad Society
 Phycological Society of America

FIELDWORK AND FLORISTICS

- 2018—current **Ozark Plateau, Boston Mountains, and Northwest Arkansas**
 ▪ *Ongoing; collected and cleaned water body samples from over 50 locations to prepare microscope slides, identify, and document diatom biodiversity; slides are maintained at the University of Arkansas.*
- 2011—2018 **Columbia Plateau, Palouse Prairie, and eastern Washington state**
 ▪ *Surveyed, collected, and identified native plants during my time as an undergraduate student, graduate student, and instructor for Systematic Botany.*

May 2025

- 2015—2018 **Hudson Biological Reserve**, Smoot Hill, WA
- *Surveyed, collected, identified, and cataloged over 600 specimens of native and invasive plant species; specimens were deposited into the WS herbarium.*

HONORIFIC NAMES

2007 ‘Wade Riley’, M. Roberts, Tall Bearded Iris, The American Iris Society