

# Wade R. Roberts

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## 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*. 34: e17817.
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.
  - Commentary published in the same issue:  
Banson I and Brown MW. Big evolutionary fireworks in tiny glass houses. *Proceedings of the National Academy of Sciences*. 122: e2511509122.
  - Media coverage from University of Arkansas News and 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. Cover image by WRR.
  - Media coverage from University of Arkansas News and multiple online science news blogs.
11. Brylka K<sup>†</sup>, 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<sup>†</sup>, 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<sup>†</sup>, 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.

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8. Onyshchenko A<sup>†</sup>, **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\*,<sup>†</sup>, **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<sup>†</sup>, 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<sup>†</sup>, **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. Cover image by WRR.
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. Cover image by WRR.

#### GRANTS AND AWARDS

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

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#### PRESENTATIONS

##### *Invited Talks:*

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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.

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2016 Molecular Plant Sciences seminar series, Washington State University, Pullman, WA.

*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

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- 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: Laboratory 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: Independently 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

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- 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.

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## IMPACT AND MEDIA COVERAGE

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- 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].

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## STUDENT MENTORSHIP

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### *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 the diatom *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.

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## OUTREACH AND SERVICE

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- 2020—current **myDiatoms** ([mydiatoms.org](https://mydiatoms.org)), citizen science outreach project, University of Arkansas.
  - *Develop and lead community and educational community 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.*
- 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*  
*BMC Plant Biology*  
*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

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## FIELDWORK AND FLORISTICS

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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.*

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.*

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## HONORIFIC NAMES

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

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## PROFESSIONAL REFERENCES

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Andrew J. Alverson, PhD (current supervisor)

Professor, Biological Sciences

University of Arkansas

[aja@uark.edu](mailto:aja@uark.edu)

Eric H. Roalson, PhD (doctoral supervisor)

Professor, Biological Sciences

Washington State University

[eric\\_roalson@wsu.edu](mailto:eric_roalson@wsu.edu)

Elizabeth C. Ruck, PhD (current colleague)

Lab Manager

University of Arkansas

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