

Miles Roberts

✉ milesdroberts@gmail.com

🐦 @MilesDaRoberts

🌐 <https://www.linkedin.com/in/miles-roberts-58b015198/>



Education

- 2020 – Present 📖 **Ph.D., Michigan State University**, Genetics and Genome Sciences
Mentor: Dr. Emily Josephs
- 2017 – 2020 📖 **Bachelor of Science, Washington State University**, Biology
Minors: Chemistry, Mathematics
Certificate: Quantitative Biology
Summa cum laude
- 2015 – 2017 📖 **Associates Degree, Clark College**, Biology

Publications




- 1 **Roberts, M.**, & Josephs, E. (2022). Weaker selection on genes with treatment-specific expression may limit plasticity evolution in *Arabidopsis thaliana*. *submitted*.
🔗 doi:<https://doi.org/10.1101/2022.10.26.513896>
- 2 Palande, S., Kaste, J., **Roberts, M.**, Segura Abá, K., Claucherty, C., Dacon, J., ... et al. (2022). The topological shape of gene expression across the evolution of flowering plants. *submitted*.
🔗 doi:<https://doi.org/10.1101/2022.09.07.506951>
- 3 Wendlandt, C., **Roberts, M.**, Nguyen, K., Graham, M., Lopez, Z., Helliwell, E., ... Porter, S. (2022). Negotiating mutualism: A locus for exploitation by rhizobia has a broad effect size distribution and context-dependent effects on legume hosts. *Journal of Evolutionary Biology*.
🔗 doi:<https://doi.org/10.1111/jeb.14011>
- 4 Wendlandt, C., Helliwell, E., **Roberts, M.**, Nguyen, K., Friesen, M., Wettberg, E., ... Porter, S. (2020). Decreased coevolutionary potential and increased symbiont fecundity during the biological invasion of a legume-rhizobium mutualism. *Evolution*. 🔗 doi:<https://doi.org/10.1111/evo.14164>
- 5 **Roberts, M.**, Seymour, H., & Dimitrov, A. (2020). Selectively caring for the most severe covid-19 patients delays icu bed shortages more than increasing hospital capacity. *SIAM Undergraduate Research Online*. 🔗 doi:<https://doi.org/10.1137/20S1379149>
- 6 Kehlet-Delgado, H., Montoya, A., Jensen, K., Wendlandt, C., Martinez, L., **Roberts, M.**, ... Porter, S. (2022). The evolutionary genomics of adaptation to stress in wild soil microbiota. *in prep*.
- 7 Montoya, A., Wendlandt, C., Benedict, A., **Roberts, M.**, Griffiths, J., Piovia-Scott, J., & Porter, S. (2022). Hosts winnow symbionts with multiple layers of absolute and conditional discrimination mechanisms. *submitted*.

Peer reviews


- 2022 📖 **Evolution**, Co-reviewed with Emily Josephs
- 2021 📖 **New Phytologist**, Co-reviewed with Emily Josephs

Presentations





Posters

- 2022  **Weaker selection on genes with treatment-specific expression may limit plasticity evolution in *Arabidopsis thaliana***
Evolution 2022 Conference
Plant Biotechnology for Health and Sustainability Retreat
- 2020  **Selectively Caring for the Most Severe COVID-19 Cases Will Delay a Hospital Bed Shortage in Washington**, Roberts M, Jensen A, Coker H, Dimitrov A
2020 WSUV Undergraduate Research Showcase
- 2019 – 2020  **Soil bacteria adapt to tolerate heavy metal stress in their local soil environment**
2020 WSUV Undergraduate Research Showcase
2019 Murdock College Science Research Conference
2019 WSU Plant Sciences Symposium
2019 WSU Symposium for Undergraduate Research and Creative Activities
2019 WSUV Undergraduate Research Showcase

Talks

- 2021  **Uncovering the contributions of regulatory element mutations in a latitudinal cline of trait correlations**, Virtual Evolution Conference

Employment History

- 2020 – Present  **Graduate Student**, Michigan State University
> Research focus: How do plants respond to their environments and how do those responses evolve?
> Analyzed 24,000 RNA-seq samples to understand factors constraining the evolution of gene expression responses
> Writing snakemake workflows to analyze thousands of publicly available sequencing datasets
- 2018 – 2020  **Lab Technician**, Porter Plant-Microbe Lab, Washington State University Vancouver
> Designed high-throughput bacterial growth curve assay with 384 well-plates
> Designed petri-dish-based assay to determine the minimum inhibitory concentration of heavy metals on bacterial growth
> Grew over 300 strains of wild bacteria in the presence and absence of nickel to understand how bacteria adapt to heavy metal stress
- 2018  **Tutor**, General Genetics and Organic Chemistry, Washington State University Vancouver Quantitative Skills Center
> Designed 60 practice questions for genetics students
> Walked through reaction mechanisms with organic chemistry students
- 2016 – 2017  **Intern**, Porter Plant-Microbe Lab, Washington State University Vancouver
> Counting bacterial colonies on agar plates
> weighing dried plant matter
> preparing plant matter for isotopic analysis




Skills

Coding	■	R, Python, Github, L ^A T _E X
Computational Biology	■	snakemake workflows , high performance computing, calling genetic variants, RNA-seq analysis, cloud computing
Population genetics	■	genome-wide association (k-mer-based, SNP-based, multivariate, univariate) , quantifying nucleotide diversity, SLiM simulations
Laboratory techniques	■	bacterial growth curves, PCR, DNA extraction, Gel electrophoresis, working with heavy metals

Outreach and Service

- 2022 – 2023 ■ **Treasurer**, Council of Graduate Students
- > Representative government of graduate students at MSU
 - > Manage \$250,000 in yearly expenses, plus \$250,000 in Funds Functioning as Endowments
 - > Chair Finance Committee, review over 60 funding requests per semester
 - > Represent graduate student voice in select hiring committees and board meetings for the MSU student radio station
 - > Reviewed short-term loan application procedures at MSU to identify gaps in getting emergency funding to graduate students
- 2021 – 2023 ■ **Treasurer**, QT-Grad
- > Social organization of queer graduate students at MSU
- 2022 ■ **Organizing Committee**, Genetics and Genome Sciences Symposium
- Invited speakers to discuss the use of "Big Data" in overcoming bottlenecks
 - lead two discussions in a semester-long seminar course on the use of machine learning in genomics
- 2021 – 2022 ■ **Peer mentor**, Graduate Recruitment Initiative Team
- > Mentored three first-year graduate students
- **Finance Committee**, Council of Graduate Students
- > Reviewed \$60,000 worth of funding applications
- **Grad School Application Feedback**, Graduate Recruitment Initiative Team
- > Reviewed grad school applications from two prospective students
 - > Met with both students one-on-one to discuss applying to graduate school
- 2021 ■ **SLAM semi-finalist**, Museum of Science in Boston
- > Science Communication competition
- 2020 ■ **Podcast Co-host**, Talking Biotech Ep. 249, Host: Dr. Kevin Folta
- > Interviewed Dr. Eva Farre about plant circadian rhythms
- **Interview**, Brian Charles Clark, A WSU Scientist Explores the Ecological and Evolutionary Power of Symbiosis, <https://magazine.wsu.edu/2020/10/31/get-together/>


Outreach and Service (continued)


- 2019  **1 hour seminar**, Playing with Bacteria: An Undergrad Science Story, Encounter Research Series, WSU
> presented my journey through undergraduate research to other undergraduates at WSU
-  **Interview**, Lindman S, Student's paper on antibiotic resistance receives 2019 Library Research Award, WSU Insider
-  **Interview**, Kimball M, Vancoug Explores the Dangers of Antibiotic-Resistance, Vancougar News Magazine

Awards and Honors

- 2022 – 2024  **Plant Biotechnology for Health and Sustainability Fellowship**, NIH
- 2022 – 2023  **Cloud Computing Fellowship**, Institute for Cyber-Enabled Research, MSU
- 2022  **Graduate Student Organization Event Funding Award**
> host game night for QT-Grad Students
- 2021 – 2022  **Integrated Training Model in Plant and Computational Sciences Fellowship**, NSF
- 2021  **NSF GRFP Honorable Mention**
- 2020  **College of Natural Sciences Recruiting Fellowship**, MSU
-  **Outstanding Researcher in Biology Award**, Washington State University Vancouver
-  **1st Place in Poster Competition**, Undergraduate Research Showcase, Washington State University Vancouver
-  **1st Place in Student Competition Using Differential Equation Modeling**, SIMIODE
- 2017 – 2019  **President's Honor Roll**, Washington State University Vancouver
- 2019  **Student Research Excellence Award**, Washington State University Vancouver
-  **Honorable Mention**, WSU-Pullman Plant Sciences Symposium Poster Competition
-  **Travel Award**, WSUV, to attend evolutionary biology conference
- 2018  **Auvil Scholars Fellowship**, Washington State University Vancouver
-  **Academic Achievement Award**, Washington State University Vancouver
-  **Travel Award**, WSUV, to attend two conferences

Awards and Honors (continued)

2017  **Washington State Honors Award**
> GPA and SAT scores in top 10 % of WA high school graduates

2015 – 2017  **Vice President's Honor Roll**, Clark College