J Grey Monroe

Assistant Professor gmonroe@ucdavis.edu
University of California Davis 279-222-8881
UC Davis Department of Plant Sciences monroelab.org
UC Davis Genome Center 262 Robbins Hall
UC Davis Climate Adaptation Research Center California Ave, Davis CA 95616

EDUCATION

Ph.D., Graduate Degree Program in Ecology 2019
Colorado State University College of Agriculture
Advisor: John McKay
Dissertation: Causes and Consequences of Plant Climate Adaptation

BSc Biology, cum laude
Appalachian State University 2012
Advisor: Matt Estep

EMPLOYMENT and APPOINTMENTS

Assistant Professor of Climate Adaptation and Plant Genomics 2020 -
University of California, Davis, CA, USA
UC Davis Department of Plant Sciences
UC Davis Genome Center
UC Davis Climate Adaptation Research Center

2019-2020
Post Doctoral Fellow
Max Planck Institute for Developmental Biology, Tubingen, Germany
Department of Molecular Biology - Adaptation to Changes
Advisor: Detlef Weigel

Data Consultant 2017 - 2019
New West Genetics, USA
Max Planck Society, Germany
United States Geological Survey, USA

CO-OP in Plant Breeding and Genetics 2016 - 2017
Cargill
Specialty Seeds and Oil Innovation Center, Fort Collins, CO

Research Assistant 2013 - 2014
Duke University, Durham, NC
Herman Staats Lab, Pathology Dept

PUBLICATIONS

Preprints:

*Kenchanmane Raju, S. K., Lensink, M., Kliebenstein, D. J., Niederhuth, C., & Monroe, G. (2023). Epigenomic divergence underlies sequence polymorphism and the evolutionary fate of duplicate paralogs in A. thaliana. bioRxiv, 2023-02

Sutherland, C., Prigozhin, D., Monroe, J.G., & Krasileva, K. (2023). High intraspecies allelic diversity in Arabidopsis NLR immune receptors is associated with higher transcription, gene body hypomethylation, and proximity to transposable elements. bioRxiv, 2023–01.

Karasov, T., Neumann, M., Shirsekar, G., Monroe, J.G., PATHODOPSIS Team, Weigel, D., & Schwab, R. (2022). Drought selection on Arabidopsis populations and their microbiomes. bioRxiv, 2022–04.

*Monroe, J.G., Murray, K., Xian, W., Carbonell-Bejerano, P., Fenster, C., & Weigel, D. (2022). Report of mutation biases mirroring selection in Arabidopsis thaliana unlikely to be entirely due to variant calling errors. bioRxiv, 2022–08.

*Quiroz, D., Lopez-Mateos, D., Zhao, K., Pierce, A., Ortega, L., Ali, A., Carbonell-Bejerano, P., Yarov-Yarovoy, V., & Monroe, J. (2022). The H3K4me1 histone mark recruits DNA repair to functionally constrained genomic regions in plants. bioRxiv, 2022–05.

Williams, C., Dai, D., Tran, K., Monroe, J.G., & Williams, B. (2022). Dynamic DNA methylation turnover in gene bodies is associated with enhanced gene expression plasticity. bioRxiv, 2022–12.

Journal articles:

*Quiroz, D., Lensink, M., Kliebenstein, D.J., Monroe ,J.G. (2023, in press) Causes of Mutation Rate Variability in Plant Genomes. Annual Reviews in Plant Biology

*Monroe, J.G. (2022). Potential and limits of (mal) adaptive mutation rate plasticity in plants. New Phytologist.

*Monroe, J.G., Srikant, T., Carbonell-Bejerano, P., Becker, C., Lensink, M., Exposito-Alonso, M., Klein, M., Hildebrandt, J., Neumann, M., Kliebenstein, D., & others (2022). Mutation bias reflects natural selection in Arabidopsis thaliana. Nature, 602(7895), 101–105.

Heckman, K., Hicks Pries, C., Lawrence, C., Rasmussen, C., Crow, S., Hoyt, A., Fromm, S., Shi, Z., Stoner, S., McGrath, C., & others (2022). Beyond bulk: Density fractions explain heterogeneity in global soil carbon abundance and persistence. Global Change Biology, 28(3), 1178–1196.

*Monroe, J.G., Cai, H., & Des Marais, D. (2021). Diversity in nonlinear responses to soil moisture shapes evolutionary constraints in Brachypodium. G3, 11(12), jkab334.

*Monroe, J.G., McKay, J., Weigel, D., & Flood, P. (2021). The population genomics of adaptive loss of function. Heredity, 126(3), 383–395.

Lawrence, C., Beem-Miller, J., Hoyt, A., Monroe, J.G., Sierra, C., Stoner, S., Heckman, K., Blankinship, J., Crow, S., McNicol, G., & others (2020). An open-source database for the synthesis of soil radiocarbon data: International Soil Radiocarbon Database (ISRaD) version 1.0. Earth System Science Data, 12(1), 61–76.

*Monroe, J.G., Arciniegas, J., Moreno, J., Sanchez, F., Sierra, S., Valdes, S., Torkamaneh, D., & Chavarriaga, P. (2020). The lowest hanging fruit: Beneficial gene knockouts in past, present, and future crop evolution. Current Plant Biology, 24, 100185.

Baggs, E., Monroe, J.G., Thanki, A., O'Grady, R., Schudoma, C., Haerty, W., & Krasileva, K. (2020). Convergent loss of an EDS1/PAD4 signaling pathway in several plant lineages reveals coevolved components of plant immunity and drought response. The Plant Cell, 32(7), 2158–2177.

Togninalli, M., Seren, ., Freudenthal, J., Monroe, J.G., Meng, D., Nordborg, M., Weigel, D., Borgwardt, K., Korte, A., & Grimm, D. (2020). AraPheno and the AraGWAS Catalog 2020: a major database update including RNA-Seq and knockout mutation data for Arabidopsis thaliana. Nucleic acids research, 48(D1), D1063–D1068.

Mason, C., LaScaleia, M., De La Pascua, D., Monroe, J.G., & Goolsby, E. (2020). Learning from dynamic traits: seasonal shifts yield insights into ecophysiological trade-offs across scales from macroevolutionary to intraindividual. International Journal of Plant Sciences, 181(1), 88–102.

*Monroe, J.G., Gill, B., Turner, K., & McKay, J. (2019). Drought regimens predict life history strategies in Heliophila. New Phytologist.

Endriss, S., Vahsen, M., Bitume, E., Grey Monroe, J.G., Turner, K., Norton, A., & Hufbauer, R. (2019). The importance of growing up: juvenile environment influences dispersal of individuals and their neighbours. Ecology Letters, 22(1), 45–55.

Prior to PhD graduation:

*Monroe, J.G., Powell, T., Price, N., Mullen, J., Howard, A., Evans, K., Lovell, J., & McKay, J. (2018). Drought adaptation in Arabidopsis thaliana by extensive genetic loss-of-function. Elife, 7, e41038.

Price, N., Moyers, B., Lopez, L., Lasky, J., Monroe, J.G., Mullen, J., Oakley, C., Lin, J., Ågren, J., Schrider, D., & others (2018). Combining population genomics and fitness QTLs to identify the genetics of local adaptation in Arabidopsis thaliana. Proceedings of the National Academy of Sciences, 115(19), 5028–5033.

Dittberner, H., Korte, A., Mettler-Altmann, T., Weber, A., Monroe, J.G., & Meaux, J. (2018). Natural variation in stomata size contributes to the local adaptation of water-use efficiency in Arabidopsis thaliana. Molecular ecology, 27(20), 4052–4065.

*Monroe, J.G., Markman, D., Beck, W., Felton, A., Vahsen, M., & Pressler, Y. (2018). Ecoevolutionary dynamics of carbon cycling in the anthropocene. Trends in ecology & evolution, 33(3), 213–225.

*Monroe, J.G., Allen, Z., Tanger, P., Mullen, J., Lovell, J., Moyers, B., Whitley, D., & McKay, J. (2017). TSPmap, a tool making use of traveling salesperson problem solvers in the efficient and accurate construction of high-density genetic linkage maps. BioData mining, 10, 1–15.

Rockenbach, K., Havird, J., Monroe, J.G., Triant, D., Taylor, D., & Sloan, D. (2016). Positive selection in rapidly evolving plastid–Nuclear enzyme complexes. Genetics, 204(4), 1507–1522.

*Monroe, J.G., McGovern, C., Lasky, J., Grogan, K., Beck, J., & McKay, J. (2016). Adaptation to warmer climates by parallel functional evolution of CBF genes in Arabidopsis thaliana. Molecular ecology, 25(15), 3632–3644.

Mojica, J., Mullen, J., Lovell, J., Monroe, J.G., Paul, J., Oakley, C., & McKay, J. (2016). Genetics of water use physiology in locally adapted Arabidopsis thaliana. Plant Science, 251, 12–22.

Zhu, M., Monroe, J.G., Suhail, Y., Villiers, F., Mullen, J., Pater, D., Hauser, F., Jeon, B., Bader, J., Kwak, J., & others (2016). Molecular and systems approaches towards drought-tolerant canola crops. New Phytologist, 210(4), 1169–1189.

Book Reviews

Monroe, J.G. (2022). Mutation, Randomness, and Evolution by Arlin Stoltzfus. The Quarterly Review of Biology, 97(2).

Monroe, J.G. (2021). Evolutionary Genetics: Concepts, Analysis, and Practice by Glenn-Peter Sætre and Mark Ravinet. The Quarterly Review of Biology, 96(3), 224.

* Corresponding Author

FELLOWSHIPS, AWARDS, and HONORS

New Phytologist Tansley Medal Finalist	2023
Rising Star in Organismal Botany, SICB	2020
Graduate Degree Program in Ecology Travel Award, CSU	2018
Graduate Degree Program in Ecology Travel Award, CSU	2017
Ralph Baker Graduate Student Award for Research Excellence, CSU	2017
NSF Graduate Research Fellowship Honorable Mention	2016
Ralph Baker Graduate Student Award for Research Excellence, CSU	2016
PMPB Research and Scholarly Excellence Award, CSU	2015
NSF Graduate Research Fellowship Honorable Mention	2015
GDPE Research and Scholarly Excellence Award, CSU	2014
Frontiers and Techniques in Plant Science Workshop Scholarship, CSHL	2014

GRANTS

PI, UC Davis Science Translation and Innovative Research Grant ($50,000) 2022-2023
Title: Engineered histone readers: disruptive technology for epigenomics

Co-PI , USDA-NIFA SCRI ($3,759,650) 2022-2026
Title: Adapting Pistachio Production to a Changing Climate

Co-PI, USDA-NIFA ($800,000) 2022-2024
Title: Accelerating Genomics Assisted Wheat Improvement by Utilizing Genetic Diversity of the Ancient Einkorn wheat

PI, Foundation for Food and Agricultural Research ($1,000,000) 2021-2024
Title: Leveraging landraces to accelerate thermotolerance in cassava

PI, California Pistachio Research Board ($375,000) 2021-2024
Title: Pistachio Pan-genome for Accelerated Breeding

Co-PI, Pacific BioSciences ($50,000) 2021-2024
Title: HiFi pan-genome and pan-transcriptome for pistachio adaptation to climate change

Co-PI, Aligning the Food System Symposium, UCD World Food Center ($25,000) 2020

Title: Catalyzing Adaptive and Resilient Food Systems

PI, Research Mentoring to Advance Inclusivity in STEM, CSU ($1,160) 2018

Co-PI, Doctoral Dissertation Improvement Grant, NSF ($19,760) 2017
Title: The evolution of plant drought tolerance and gene function across historic drought frequency gradients

PI, Evo-Devo-Eco Network Grant, Harvard University ($3,000) 2016
Title: Variation in developmental and physiological responses to a gradient of water availability in *Brachypodium*

SERVICE

Publication Reviewer:
PNAS, Science Advances, Nature Communications, Cell, Genome Biology, Genetics, Evolutionary Ecology, American Naturalist, Molecular Plant, Evolution, New Phytologist, FEMS Microbiology Reviews, Theoretical and Applied Genetics, Evolutionary Applications, Scientific Reports, PLoS One, Molecular Ecology, Nucleic Acids Research, Plant Cell and Enviroment, The Plant Journal, Genes

Grant Reviewer:
NSF

Other service (mentorship, leadership, outreach, symposia):

Faculty Organizer: Plant Sciences Symposum (Corteva + UC Davis) 2022-2023

Plant & Animal Genomes Conference Workshop Organizer ("*Mutation*") 2023

American Society of Plant Biologists Plantae Mentoring Center 2021

Co-director UC Davis Climate Adaptation Research Center 2021-2023

Co-organizer Catalyzing Adaptive and Resilient Food Systems @ UC Davis Climate Adaptation Research Center 2020

Lecturer on Implicit Bias @ CSU Research Mentoring to Advance Inclusiveness in Science 2018

Assistant organizer BSURE Undergraduate Summer Mentorship Program 2017

Co-organizer Drought Tolerance in Agriculture and Natural Ecosystems Symposium DuPont-Pioneer and Colorado State University 2017

Assistant Organizer Front Range Student Ecology Symposium by Graduate Degree Program in Ecology and Colorado State University 2015, 2017

MENTORSHIP

6 Graduate students
- Daniela Quiroz
- Alice Pierce
- Matt Davis
- Kehan Zhao
- Elton Kane
- Mariele Lensink

3 Postdoctoral scholars
- Chaehee Lee
- Kevin Bird
- Evan Long

8 Undergraduate students
2 High school students
Visiting International Scholars
- Lea Berg
- Daniela A. Trippa

TEACHING

UC Davis:

Primary Instructor: Plant Genetics (PLS 152)	Fall 2022
Primary Instructor: Applied Multivariate Modeling for Agricultural and Environmental Sciences (PLS 206)	Winter 2022 Winter 2023
Guest Lecturer: BIT 150 (2), IAD 200 (2), PBI 291 (2), PLS 152 (2), PLS 220	2022-

Previous:

Guest Lecturer (CSU) Ecosystem Ecology, Drought Tolerance Breeding Workshop, Principles of Data Visualization Using R and ggplot2

Teaching Assistant (CSU): Molecular and General Genetics

Assistant Instructor (CSU) Software Carpentry Workshop

Presentations

Recent Contributed/Invited Talks

Biology Colloquium at Queens College, City University of New York, NY	2023

Carnegie Institution for Science, Department of Plant Biology, Stanford University	2023
Department of Genetics, University of Georgia	2023
Pistachio Work Group and Funding Meeting, Parlier, CA	2023
Cassava Retreat, International Center for Tropical Agriculture, Palmira, Colombia	2023
Symposium on Physical Genomics, Northwestern University, Chicago, IL	2022
Society for Molecular Biology and Evolution, Mutational Biases and Adaptation Conference	2022
The Donald Danforth Plant Science Center, Olivette, MO	2022
Institute for Integrative Genome Biology, University of California, Riverside	2022
Plant & Microbial Biology, University of California, Berekeley	2022
Institute of Integrative Biology and Systems, Université Laval, Quebec, Canada	2022
Max Planck Chinese Scholars Association, Multidisciplinary Webinar Series	2022
Integrative Plant Epigenics Conferene, Cold Spring Harbor Laboratory Asia, Awaji, Japan	2022
Department of Biology, University of Tokyo	2022
Plant Biology Worldwide Summit, American Society of Plant Biologists	2021
Innovative Genomics Institute, University of California, Berekeley	2021
International Evolution Conference	2021
International Conference on Arabidopsis Research	2021
Pistachio Work Group and Funding Meeting	2021
Plant Resilience Institute, Michigan State University	2020
Institute of Evolution and Ecology, University of Tübingen, Germany	2020
Institute of Ecology and Evolution, Universität Bern, Switzerland	2020
Society for Integrative and Comparative Biology, Austin, TX	2020
Carnegie Institution for Science, Department of Plant Biology, Stanford University	2020
Pistachio Work Group and Funding Meeting	2020
International Plant and Animal Genome Conference, San Diego, CA	2019
International Center for Tropical Agriculture, Palmira, Colombia	2019
Plant Genome Evolution, Sitges, Spain	2019
Climate Summit of Generations, Hamburg, Germany	2019

Presentations at UC Davis

Climate Adaptation Research Center Seminar Series	2023
Integrated Genetics and Genomics Winter Seminar on Plant Genetics	2023
Plant Sciences Deparmental Seminar	2022
Seminar in DNA Repair & Recombination	2022
Plant Biology Graduate Group Colloquium	2022
Integrated Genetics and Genomics Colloquium	2022
Corteva Plant Sciences Symposium	2021
Seminar in DNA Repair & Recombination	2021

Plant Biology Graduate Group Colloquium Taylor Lab Retreat Seed Central	2021 2021 2021
Plant Biology Graduate Group Colloquium Integrated Genetics and Genomics Colloquium	2020 2020