

Kehan Zhao

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EDUCATION

- Ph.D. Candidate in Plant Biology** 2021 - Present
University of California, Davis (UCD)
Academic advisor: Dr. J. Grey Monroe
- B.S. in Plant Science and Technology** 2015 - 2019
School of Agriculture and Biology, Shanghai Jiao Tong University
Academic advisor: Jingjin Zhang
Thesis: Effects of Red Light and Far-Red Light on the Growth, Development, and Hormone Levels of Water Spinach Sprouts
- B.A. in English (Translation)** 2017 - 2019
School of Foreign Language, Shanghai Jiao Tong University

RESEARCH POSITIONS & EXPERIENCES

- Graduate Student Researcher** 2021 - Present
Advisor: Dr. J. Grey Monroe
Department of Plant Sciences, University of California, Davis
Main Project: Loss-of-function (LoF) burden tests in Arabidopsis - Developed novel computational pipelines to call LoF alleles and discover causal relationships with trait variation, computationally recapitulated flowering time networks in Arabidopsis, and performed experimental validation through RNAseq.
Main Project: Genetic diversity in Colombian cassava landraces - Analyzed over 1000 cassava genomes, including 387 newly sequenced Colombian landraces, to investigate population structure, climate-associated genetic differentiation, and the functional consequences of LoF mutations.
Main Project: Gene loss-of-function in diploid wheat - Investigating patterns of LoF variation in *Triticum monococcum* and their potential roles in adaptation and domestication.
- Master Researcher** 2019 - 2021
Advisor: Dr. Julin Maloof
Department of Plant Biology, University of California, Davis
Main Project: CRISPR-based functional analysis of *LEAFY* in *Ceratopteris richardii* - Developed a CRISPR/Cas9 system for *C. richardii* to generate knockout lines targeting *CrLFY*.
Main Project: Genetic characterization of a *Brassica rapa* mutant with altered far-red light response - Investigated the role of the *phyB-ein194* allele in driving an elongated hypocotyl phenotype under far-red light.
- Undergraduate Researcher** 2016 - 2019
Advisor: Dr. Jingjin Zhang
School of Agriculture and Biology, Shanghai Jiao Tong University
Main Project: Investigated the effects of light intensity, light quality, and photoperiod on water spinach sprouts with the goal of optimizing yield and nutritional value.

PUBLICATIONS

In Revision, Review, or Prep

Monroe JG, Lensink M, Ahn V, Davis M, Oya S, **Zhao K**. Delineating Mutation bias and selection during plant development. **(2025)** bioRxiv. 2025.11. 01.686053. <https://doi.org/10.1101/2025.11.01.686053>

Zhao K, Lensink M, and Monroe JG. Functional insights into dispensable genes using genome-wide loss-of-function burden tests in Arabidopsis. **(2025)** bioRxiv. 2025.04.30.651390. <https://doi.org/10.1101/2025.04.30.651390>

Published Peer-Reviewed Papers

Zhao K, Long E, Sanchez F, Monier E, Chavarriaga P, and Monroe JG. Unlocking genetic diversity in Colombian cassava landraces for accelerated breeding. **(2026)** New Phytologist. <https://doi.org/10.1111/nph.70918>

Monroe JG, Lee C, Quiroz D, Lensink M, Oya S, Davis M, Long E, Bird KA, Pierce A, **Zhao K**, et al. Convergent evolution of epigenome recruited DNA repair across the Tree of Life. **(2025)** eLife. <https://doi.org/10.7554/elife.105016.1>

Quiroz D, Oya S, Lopez-Mateos D, **Zhao K**, Pierce A, Ortega L, Ali A, Carbonell-Bejerano P, Yarov-Yarovoy V, Suzuki S, et al. H3K4me1 recruits DNA repair proteins in plants. **(2024)** Plant Cell. 36(6):2410 - 2426.

<https://doi.org/10.1093/plcell/koae089>

Zhao S, **Zhao K**, Chen Z, Zhang J, Huang D. Growth response of water spinach sprouts to LED light intensity and light quality. **(2019)** China Vegetables. 1(6):51 - 57. [In Chinese]

PRESENTATIONS

Functional insights into dispensable genes using loss-of-function GWAS in Arabidopsis. (2026) [Oral] **PAG 33 (Plant and Animal Genome Conference 33)**, San Diego, CA

Functional GWAS for breeding: harnessing loss-of-function variation to fast-track gene discovery. (2025) [Oral] **UCD Plant Breeding Annual Retreat**, Bodega Bay, CA

Functional insights into dispensable genes using loss-of-function GWAS in Arabidopsis. (2025) [Poster] **PAG 32 (Plant and Animal Genome Conference 32)**, San Diego, CA

Climate adaptation in cassava landraces. (2024) [Oral] **PAG 31 (Plant and Animal Genome Conference 31)**, San Diego, CA

Utilizing loss-of-function (LoF) variations for gene discovery and crop improvement. (2024) [Oral] **2024 UCD PBGG Colloquium**, Davis, CA

A novel gene discovery approach: LoF-expression genome-wide association study. (2022) [Poster] **UCD Plant Sciences Symposium**, Davis, CA

The evolutionary significance of loss-of-function alleles in *Arabidopsis thaliana* transcription factors. (2021) [Video flash talk] **Evolution Conference**

AWARDS & FELLOWSHIPS

Graduate Student Research (GSR) Award, UCD (\$20,000 per year)	2021 - 2025
Jastro-Shields Research Award for the Plant Biology Graduate Group, UCD (\$3,000)	2023
Jastro-Shields Research Award for the Plant Biology Graduate Group, UCD (\$3,000)	2021
Outstanding Graduate Award, Shanghai Jiao Tong University, China	2019
Scholarship Awards for Academic Excellence, Shanghai Jiao Tong University, China	2018
Scholarship Awards for Academic Excellence, Shanghai Jiao Tong University, China	2017

TEACHING & MENTORING EXPERIENCES

Teaching Assistant

BIS 2B (Introduction to Biology: Principles of Ecology & Evolution), UCD	Spring 2021, Winter 2022
BIS 2C (Introduction to Biology: Biodiversity & the Tree of Life), UCD	Winter 2021, Fall 2021
BIS 101 (Genes & Gene Expression), UCD	Fall 2020
BIS 103 (Bioenergetics & Metabolism), UCD	Spring 2020
ABI 103 (Animal Biochemistry & Metabolism), UCD	Winter 2020

Mentorship

Supervised and mentored three undergraduate students in research projects at UC Davis, providing guidance in experimental design and data analysis.

PROFESSIONAL SERVICE

Service to Laboratory

Safety manager at Monroe Lab, UCD 2021 - Present

Peer Review

Participated in peer review for manuscripts submitted to *New Phytologist* and *Nature Genetics*.

REFERENCE

Dr. J. Grey Monroe

Ph.D. Advisor

Assistant professor, University of California, Davis

Department of Plant Sciences

Co-director, Climate Adaptation Research Center

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