Yu-Ya Liang

Assistant Professor

Department of Biology | Utah Valley University

liangyu@uvu.edu | yoyopikachu.github.io | Google Scholar

Professional Appointments

Assistant Professor — *Orem, UT*

Dept. of Biology, Utah Valley University — *August 2023 –> Present*

Research Associate — *East Lansing, MI*

Dept. of Plant Biology, Michigan State University | Mentor: Kevin Childs — *August 2019 –> July 2023*

Education

Ph.D. in Plant Breeding — *College Station, TX*

Texas A&M University — *2016 –> 2019*

- Advisor: Dr. Endang Septiningsih
- Dissertation: Genetics and genomics studies for water-related stresses in rice (*Oryza sativa*)

M.S. in Agronomy — *Taipei, Taiwan*

National Taiwan University — *2013 –> 2016*

- Advisor: Dr. Kai-Yi Chen
- Thesis: Genetic characterization of the late blight resistant locus *qPh2.1* in tomato

B.S. in Agronomy — *Taichung, Taiwan*

National Chung Hsing University — *2009 –> 2013*

Peer-Reviewed Publications

†Undergraduate Author, *Contributed equally.

1. *Mustahsan, W. K., ***Liang, Y.**, Mohammed, A. R., Johnson, C. D., Septiningsih, E. M., Tarpley, L., & Thomson, M. J. (2024). Transcriptome profiling of two rice varieties reveals their molecular responses under high night-time temperature. *PLOS ONE*, *19*(10), e0311746. https://doi.org/10.1371/journal.pone.0311746
2. Planta, J., **Liang, Y.-Y.**, Xin, H., Chansler, M. T., Prather, L. A., Jiang, N., Jiang, J., & Childs, K. L. (2022). Chromosome-scale genome assemblies and annotations for poales species *Carex cristatella, Carex scoparia, Juncus effusus, and Juncus inflexus*. *G3 GenesGenomesGenetics*, *12*(10), jkac211. https://doi.org/10.1093/g3journal/jkac211
3. **Liang, Y.**, Cason, J. M., Baring, M. R., & Septiningsih, E. M. (2021). Identification of QTLs associated with sclerotinia blight resistance in peanut (*Arachis hypogaea* L.). *Genetic Resources and Crop Evolution*, *68*(2), 629–637. https://doi.org/10.1007/s10722-020-01012-4
4. **Liang, Y.**, Tabien, R. E., Tarpley, L., Mohammed, A. R., & Septiningsih, E. M. (2021). Transcriptome profiling of two rice genotypes under mild field drought stress during grain-filling stage. *AoB PLANTS*, *13*(4), plab043. https://doi.org/10.1093/aobpla/plab043
5. **Liang, Y.**, Biswas, S., Kim, B., Bailey-Serres, J., & Septiningsih, E. M. (2021). Improved transformation and regeneration of indica rice: Disruption of SUB1A as a test case via CRISPR-Cas9. *International Journal of Molecular Sciences*, *22*(13), 6989. https://doi.org/10.3390/ijms22136989
6. **Liang, Y.**, Wang, S., Harper, C. L., Subramanian, N. K., Tabien, R. E., Johnson, C. D., Bailey-Serres, J., & Septiningsih, E. M. (2021). Reference-guided de novo genome assembly to dissect a QTL region for submergence tolerance derived from ciherang-Sub1. *Plants*, *10*(12), 2740. https://doi.org/10.3390/plants10122740
7. **Liang, Y.**, Baring, M. R., & Septiningsih, E. M. (2018). Mapping of quantitative trait loci for yield and grade related traits in peanut (*Arachis hypogaea* L.) using high-resolution SNP markers. *Plant Breeding and Biotechnology*, *6*(4), 454–462. https://doi.org/10.9787/PBB.2018.6.4.454
8. **Liang, Y.**, Baring, M., Wang, S., & Septiningsih, E. M. (2017). Mapping QTLs for leafspot resistance in peanut using SNP-based next-generation sequencing markers. *Plant Breeding and Biotechnology*, *5*(2), 115–122. https://doi.org/10.9787/PBB.2017.5.2.115

Manuscripts in Preparation

†Undergraduate Author, *Contributed equally.

1. Massa, A. N., Sobolev, V. S., Orner, V. A., Walk, T. E., Butts, C. L., Lamb, M. C., **Liang, Y.**, Childs, K. L., & Arias, R. S. Genetic variants in the peanut transcriptome in response to aspergillus infection. *In Prep for Submission*.
2. **Liang, Y. Y.**, Planta, J., & Childs, K. L. Comparative genomic analysis of codon usage bias and tRNA abundance in grass and non-grasses species. *In Prep/Data Analysis*.
3. **Liang, Y. Y.**, & Childs, K. L. Ribosome-profiling reveals the translational regulation of gene expression by gene structure, codon usage and tRNA in rice. *In Prep/Data Analysis*.
4. †Hales, A. K., †Lazarte, L., Laney, A., & **Liang, Y.-Y.** Genome-wide association study of DNA virus resistance in brassica species. *In Prep/Data Analysis*.

Teaching Experience

College Biology I (Utah Valley University, BIOL 1610)— Instructor of Record

Introduce students to core concepts in biochemistry, energetics, cell structure and function, genetics, and evolution. Emphasize scientific reasoning through hypothesis generation, data evaluation, and problem solving, and connect biological concepts to issues in society.

- Fall 2023, 68 students
- Spring 2024, 53 students
- Fall 2024, 47 students
- Spring 2025, 50 students

Introduction to Data Analysis for Biologists (Utah Valley University, BIOL 3100)— Instructor of Record

Intro to R programming from zero to data analysis and visualization; focuses on reproducible workflows, tidy data, experimental design, modeling, and hypothesis testing. Students create publication quality figures and build an R Markdown website hosted on GitHub.

- Fall 2024, 12 students
- Spring 2025, 12 students

Controlled Environment Experiments in Horticulture (Utah Valley University, BOT 3210)— Instructor of Record

Course based undergraduate research experience. Students identify a garden problem, design and run greenhouse or growth chamber trials, manage environmental controls and crop care, analyze data, and present findings at the Biology Symposium.

- Fall 2024, 6 students

Plant Biology (Utah Valley University, BOT3340)— Instructor of Record

Course based undergraduate research experience. Students identify a garden problem, design and run greenhouse or growth chamber trials, manage environmental controls and crop care, analyze data, and present findings at the Biology Symposium.

- Fall 2024, 6 students

Controlled Environment Experiments in Horticulture (Utah Valley University, BOT 3210)— Instructor of Record

Angiosperm focused course on plant structure and function covering cells, meristems, anatomy, transport, photosynthesis, hormones, and adaptations; weekly literature discussions and student led final presentations.

- Fall 2023, 22 students
- Fall 2024, 18 students

Plant Propagation (Utah Valley University, BOT 3710)— Instructor of Record

Teach seed, cutting, grafting, layering, bulb, and micropropagation methods with emphasis on the plant biology behind each; students gain hands on practice with propagation techniques and management.

- Fall 2023, 9 students
- Fall 2023, 12 students

Plant Kingdom (Utah Valley University, BOT 2400)— Instructor of Record

Online course with weekly lab on structure, reproduction, classification, and evolution of fungi, algae, prokaryotes, and land plants; includes mitosis and meiosis, alternation of generations, flowering plant reproduction, natural selection, and phylogeny.

- Spring 2024, 28 students
- Spring 2025, 30 students

Horticulture Crop Production (Utah Valley University, BOT 490R)— Instructor of Record

Practical course on fruit, vegetable, and ornamental production at garden scale; covers soil management, plant nutrition, and pest control using conventional and organic methods; includes hands on planting, cultivation, and a final sustainable garden plan.

- Summer 2024, 7 students
- Summer 2025, 3 students

Crop Biology and Physiology (Texas A&M University, SCSC 307)— Laboratory TA

Led weekly labs on seed biology, germination, plant anatomy, hormone responses, membrane transport, water relations, photosynthesis, respiration, and flowering; prepared reagents and plant materials, delivered review sessions, guided data collection and analysis, and graded lab reports.

- Spring 2019, 24 students

Soil Science (Texas A&M University, SCSC 301)— Laboratory TA

Led weekly labs on soil texture, structure, classification, pH and salinity, cation exchange capacity, organic matter, water retention, and nutrient testing; prepared materials and instruments, taught sampling and analysis, supported data interpretation, and graded reports.

- Fall 2018, 24 students

Genetics (National Taiwan University, Agron2009)— Laboratory TA

Led labs on Mendelian inheritance, genetic linkage mapping, complementation tests, and chi square analysis; maintained Drosophila stocks, prepared rice seedlings, managed rice field plots, supervised crosses and data collection, and graded lab reports.

- Spring 2014, 36 students

Synergistic Activities

Mentorship

Undergraduate Student Mentored —(their current position)

- Aubrilin Johnson (current student)
- Stirling Todd (current student)
- Dalton Palmer (current student)
- Lanreana Lazarte (research student at Virology Lab, UVU)
- Adam Hales (PhD student in Plant Breeding, University of Georgia)
- Erick Alvarez (MS student in Biomedical Informatics at the University of Utah)

Societies & Service

Professional Level

- ASHS Graduate Student Poster Competition Judge (2025)

University Level

- First-Gen Mentor (2025-current)
- GEL Review Committee (2025-current)

College Level

- Volunteered at STEM Fest (2023 & 2024)
- Volunteered at College of Science Care Station (2024 & 2025)

Department Level

- Faculty Search Committees (Member 2x)
- Strategic Planning Committee (Member, 2024-current)
- Greenhouse and Growth Chamber Management Committee (Member, 2024-current)

Program and Course Development

Plant Propagation (BOT 3710)

- Co-developed with Greenhouse Director Boston Swan. Designed hands on labs in seed, cutting, grafting, layering, bulb, and micropropagation with integrated greenhouse management practice.

Controlled Environment Experiments in Horticulture (BOT 3210)

- Developed CURE course where students identify garden problems, run greenhouse or growth chamber trials, analyze data, and present at the Biology Symposium.

Horticulture Crop Production (BOT 490R)

- Created modules for small farm and garden settings on soil management, plant nutrition, and pest control in conventional and organic systems. Students gain hands on practice in planting and cultivation and complete a capstone sustainable garden plan applied to real sites.

Active Collaborations

Childs Lab, Michigan State University

- tRNA-sequencing and translation efficiency

Gastrointestinal Laboratory, Texas A&M University

- Image analysis for disease diagnosis

Energy and Environmental Science Institute, West Virginia State University

- Transcriptomics of heavy metal transport in plants

Virology Lab, Utah Valley University

- Disease resistance in Brassica species

Rotter Lab, Utah Valley University

- Native plant breeding

Egan Lab, Utah Valley University

- Domestication of *Phaseolus*

Peer review

Journals

- Plant Physiology
- Experimental Agriculture
- The Crop Journal
- Crop Science
- Molecular Biology Reports
- Physiology and Molecular Biology of Plants
- Scientia Agricola
- Rice
- Phytochemistry
- BMC Plant Biology
- Tropical Plant Biology
- Journal of Crop Health
- Agronomy

Seminars and Conference Presentations

†Undergraduate Author, *Presenting Author.

2025

1. *†Palmer, D., Redd, J., & **Liang, Y.-Y.** Comparative observation of trichome type and density in *Solanum* spp. Using scanning electron microscopy. *American Society for Horticultural Science Annual Meeting*, *New Orleans, LA*.
2. *†Todd, S., Rotter, M., Hjelmen, C., & **Liang, Y.-Y.** Optimization of genome size estimation protocol for thimbleberry (*Rubus parviflorus*). *American Society for Horticultural Science Annual Meeting*, *New Orleans, LA*.
3. *†Baum, A., **Liang, Y.-Y.**, & Rotter, M. Concentration of phenolic compounds in *Populus* (salicaceae). *Botany Annual Meeting*, *Palm Springs, CA*.
4. *†Johnson, A., & **Liang, Y.-Y.** Optimizing tissue culture for germination and growth of drought-tolerant wild tomato. *Utah Conference on Undergraduate Research*, *Cedar City, UT*.
5. *†Lazarte, L., & **Liang, Y.-Y.** Phenotypic variation in brassica species: Impact on resistance mechanisms. *Utah Conference on Undergraduate Research*, *Cedar City, UT*.

2024

1. *†Hales, A. K., †Lazarte, L., Laney, A., & **Liang, Y.-Y.** Uncovering genetic resistance to DNA viruses in brassica species. *ASA, CSSA, SSSA International Annual Meeting*, *San Antonio, TX*. (Oral Presentation)
2. *†Hales, A. K., & **Liang, Y.-Y.** Geminivirus resistance in mustard plants. *Utah Conference on Undergraduate Research*, *Orem, UT*. (Oral Presentation)
3. *†Lazarte, L., & **Liang, Y.-Y.** Geminivirus resistance in mustard plants. *Utah Conference on Undergraduate Research*, *Orem, UT*.
4. *†Johnson, A., & **Liang, Y.-Y.** Transcriptome analysis to study the effects of drought on tomato. *Utah Conference on Undergraduate Research*, *Orem, UT*. (Oral Presentation)

Selected Presentations (Before 2024)

1. ***Liang, Y.**, Tabien, R., Tarpley, L., Mohammed, AR., Dou, F., & Septiningsih, EM. (2017). Agronomic characterization of two rice cultivars under drought conditions. *Texas A&M Agrilife Research Extension Field Day*, *Beaumont, TX*.
2. ***Liang, Y.**, Baring, M., Wang, S., & Septiningsih, EM. (2017). Mapping QTLs for leafspot resistance in peanut using SNP-based next-generation sequencing markers. *ASA CSSA SSSA International Annual Meeting*, *Tampa, FL*.
3. ***Liang, Y.**, Tabien, R., López, M., Prior, M., Cabanlit, S., Bailey-Serres, J., & Septiningsih, EM. (2019). Toward the characterization of qSub8.1 for super submergence tolerance in rice. *Plant and Animal Genome Conference*, *San Diego, CA*.
4. ***Liang, Y.**, Planta, J., & Childs, KL. (2023). Comparative genomic analysis of codon usage bias and tRNA abundance in monocots. *Plant and Animal Genome Conference*, *San Diego, CA*.
5. *Massa, AN., Sobolev, VS., **Liang, Y.**, Orner, VA., Walk, TE., Lamb, MC., Childs, KL., & Arias, RS. (2023). Developing genomic resources for aflatoxin resistance in peanuts. *Plant and Animal Genome Conference*, *San Diego, CA*.

Selected Funding and Awards

Faculty Senate Travel & Instructional Development Grant
$1300 | 2024 & 2025

UVU College of Science Scholarly Activities Committee (SAC) Dissemination Award
$1500 | 2024 & 2025

UVU College of Science Scholarly Activities Committee (SAC) Summer Research Award
$3500 | 2024

UVU Grants for Engaged Learning (GEL)
$3500 | 2025

External Proposals

NSF BRC-BIO: Examining Drought and Heat Tolerance Mechanisms and Enhancing Propagation Ability in Native Plants
$499,818 | (Proposal not funded, program discontinued.)