

EDUCATION

Biochemistry Ph.D. Candidate

2020 - Present

University of Nevada, Reno

Biochemistry and Molecular Biology B.S.

2019

University of Nevada, Reno

Thesis: "Chromatin Conformation Dynamics Mediate Stress-induced Betacyanin Biosynthesis in the Common Ice Plant"

PUBLICATIONS

WC Yim, **ML Swain**, D Ma, H An, KA Bird, DD Curdie, S Wang, HD Ham, A Luzuriaga-Neira, JS Kirkwood, M Hur, JKQ Solomon, JF Harper, DK Kosma, D Alvarez-Ponce, JC Cushman, PP Edger, AS Mason, JC Pires, H Tang, X Zhang (2022). The final piece of the Triangle of U: Evolution of the tetraploid *Brassica carinata* genome. *The Plant Cell*, Volume 34, Issue 11, November 2022, Pages 4143–4172
<https://doi.org/10.1093/plcell/koac249>

PUBLICATIONS IN PREPARATION

WC Yim, **ML Swain**, JS Lomas, JC Cushman. High-Quality genome assembly of Saharan mustard (*Brassica tournefortii*) for investigation of genetic diversity in climate change adaptation.

WC Yim, **ML Swain**, JS Lomas, LM Petrusa, SD Lim, BWM Wone, J Ha, H Yin, X Yang, JC Cushman. A genetic blueprint for facultative crassulacean acid metabolism (CAM): Chromosome-level genome assembly and temporal mRNA expression profiling in the common ice plant. Target journal: *The Plant Cell*

AB Nuss, **ML Swain**, JS Lomas, W Lei, O Garcia-Cruz, G Kaur, A Sharma, JB Reyes, M Pham, S Beniwal, M McVicar, I Hinne, X Zhang, WC Yim, M Gulia-Nuss. Highly improved reference genome of *Ixodes scapularis* with X and Y chromosomes. Target journal: *Nature communications*

HONORS AND AWARDS

UNR Graduate Student Association Travel Award 2023 (\$500)

Robert E. Dickenson Scholarship 2022 - 2023

Agricultural Research Fellowship 2022 - 2023

Raymond Berner Graduate Scholarship 2020 - 2022

Nevada INBRE Scientific Core Services Award 2021 (\$2,600)

Nevada INBRE Undergraduate Research Opportunity Program 2019 (\$6,600)

College of Agriculture, Biotechnology, and Natural Resources Dean's List 2017 - 2019

RESEARCH PROJECTS

The role of Fatty Acyl Reducatases on erucic acid content in *Brassica* oilseed species

- Investigated the effect of intronic transposable element insertions in *FAR1*
- Conducted comparative genomics, cloning, and GC-MS experiments

The evolution of the tetraploid *Brassica carinata* genome

- High-quality reference assembly generated using PacBio and Hi-C sequencing technologies
- Analyzed the structure of the *B. carinata* genome and investigated key agronomic genes
- Conducted sequencing library preparation and comparative genomic analysis

Stress-induced C₃-to-CAM photosynthetic transition in the common ice plant

- Investigated the molecular mechanism underlying phenotypic plasticity in the facultative CAM species
- Conducted phenotypic analysis and Hi-C, RNA-Seq, and DAP-Seq experiments

TALKS

Biochemistry Seminar Series (Reno, NV)	2021
<i>"The final piece of the Triangle of U: Evolution of the tetraploid Brassica carinata genome"</i>	

POSTER PRESENTATIONS

Plant and Animal Genome Conference (San Diego, CA)	2023
George G. Bierkamper Molecular Biosciences Symposium (Reno, NV)	2022
Plant and Animal Genome Conference (virtual)	2022
George G. Bierkamper Molecular Biosciences Symposium (Reno, NV)	2021
American Society of Plant Biologists Conference (virtual)	2020
Global Climate Change Summit (Reno, NV)	2019
American Society of Plant Biologists Conference (San Jose, CA)	2019
Undergraduate Research Symposium (Reno, NV)	2019

TEACHING ASSISTANTSHIPS

Analytical Biochemistry Laboratory (BCH 303)	Fall 2022
Systems Biology (BCH 487/867)	Spring 2022, 2023
Introduction to Biochemistry (BCH 400)	Spring 2020, 2021
Introduction to Bioinformatics (BCH 709)	Fall 2020, Spring 2023

MENTORING EXPERIENCE

Zachary Fung - transformation project (<i>Arabidopsis thaliana</i>)	2022-2023
Sarah Gu - transformation project (<i>Brassica carinata</i>)	2020-2022
Samuel Wang - molecular biology techniques	2020-2021

PROFESSIONAL DEVELOPMENT

CompBio Asia: Computational Biology for Graduate Students

2022-2023

4-weeks of hands-on training in computational biology (Thailand & Singapore)

Foundational Open Science Skills Workshop

2023

Cyverse's 10-week training on essential skills in doing collaborative open science (virtual)