Bailey Farms Outstanding Graduate Student Researchers 2025

The University of California Riverside's Center for Plant Cell Biology recognized two outstanding PhD students for their research accomplishments in 2025 at the Annual December Awards Ceremony. A committee of faculty and early career researchers solicited nominations from 50+ faulty and selected two winners. One is plant biologist, Taryn Dunivant, who works on protecting plants from a type of worm destroys crops. The other a plant pathologist, Huaitong Wu, who has made progress developing a method to protect plants from destructive bacteria and fungi.

The two winners have provided a description of their work for Bailey Farms.

Taryn Dunivant, PhD candidate in Plant Biology

Plant-parasitic nematodes are tiny "round" worms that pose a big threat to the global agricultural industry. Although they are often invisible to the naked eye, they cause enormous damage to agriculture by reducing yields and weakening vital crops in ways that can be difficult to diagnose and costly to manage. Many crops lack effective nematode resistance, making advanced genetic tools a potential game-changer. Rice, a staple crop crucial for global food security, is particularly susceptible to so-called "root-knot nematodes". I have dedicated my PhD to pursuing the discovery of molecular defenses that can be deployed in farmer preferred rice varieties to protect and strengthen them. This has led to discoveries that include the plant-made (phyto)chemicals called diterpenoids, and structural reinforcements of cell walls as mechanisms that increase resistance against nematodes.

At the International Rice Research Institute

These discoveries matter because they provide genetic and biological targets that researchers and plant breeders can use to develop more resistant crops. Stronger built-in resistance can reduce dependence on chemical treatments, support more sustainable production, and help protect yield, benefiting farmers and food systems.

Beyond research, I am committed to education and scientific communication. I value making science accessible through mentoring students, sharing research with broader audiences, and helping translate complex findings into clear, practical insights.

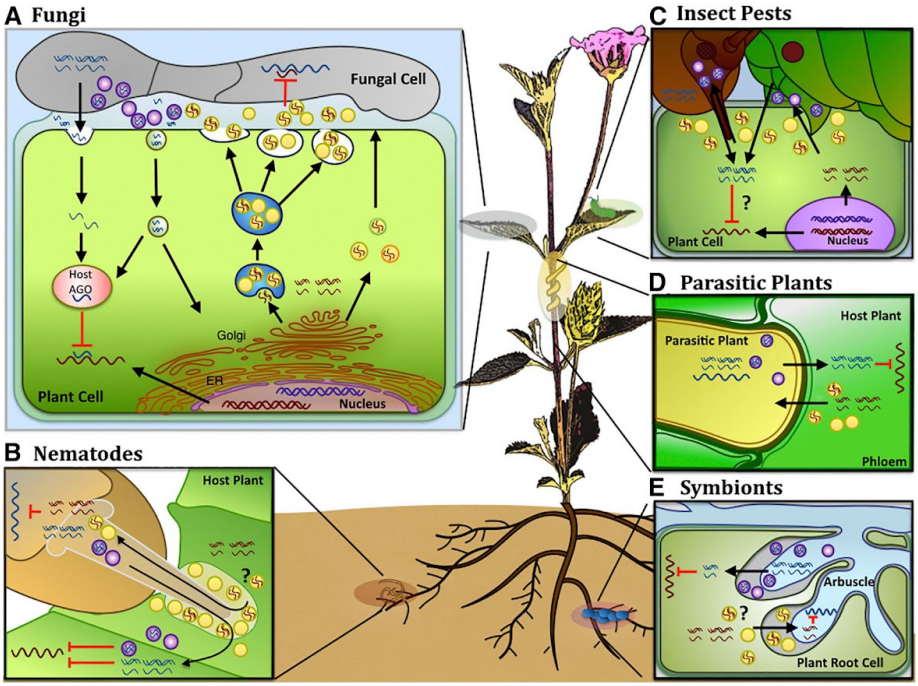
Taryn is directed by Prof. Simon "Niels" Groen. More about Groen's research.

Huaitong Wu, PhD candidate in Plant Pathology

Fighting bacterial and fungal infections is increasingly difficult globally due to growing resistance against traditional antibiotics and fungicides, creating an urgent need for new solutions in both medicine and agriculture. My research at UC Riverside investigates a cutting-edge approach that parallels modern human RNA therapies: harnessing plants' natural "delivery bubbles" (extracellular vesicles) to transport genetic instructions that can disarm a pathogen, such as one that makes a strawberry perish after harvest or impacts the quality of grapes on the vine.

We have identified specific proteins in plants that use this system to fight disease, and we are developing "good" bacteria to act as living factories that deliver these protective agents directly to the fungus. By understanding how plants package these genetic messages, we aim to create environmentally friendly crop treatments while also uncovering insights that could improve drug delivery systems for human health.

Huaitong is directed by Prof. Hailing Jin. A major discovery by this lab is the exchange of genetic material (small RNAs or proteins) between plants and their enemies including bacteria, fungi (mushrooms) and nematodes (round worms). The exchange can occur in both directions. Plants fight by destroying the transferred information in their cells. They can also fight back with their own ability to send genetic material into their enemy. use this mechanism to battle their foes. The figure below explains this natural battle. Huaitong work seeks to disarm pathogens by shipping “messages” via the yellow circles in panel A.



Courtesy of Huang et al., 2019, Cell Host & Microbe, with modifications