A Community of Scholars

University of Oregon genetics researchers Chris Holzapfel and Bill Bradshaw.

The small, black mosquito known as Wyeomyia smithii develops within the water-filled leaves of the predatory carnivorous purple pitcher plant. ▸

In a large, computer-driven room on the UO campus, genetics researchers Bill Bradshaw and Chris Holzapfel can replicate the temperature, humidity, and day-night cycle of any place on the planet. "This is New Jersey in the summer," Holzapfel says, walking into the humid, windowless room.

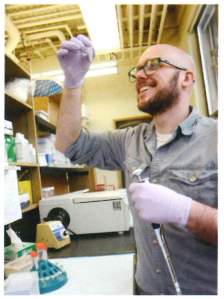
Tucked inside Pacific Hall at the Bradshaw-Holzapfel laboratory are three more controlled-environment rooms, each programmed to simulate a natural environment—from the tropics to the polar regions—and to give UO researchers an opportunity to understand how genetics actually works in the real world.

This is where researchers at the UO's Institute of Ecology and Evolution raise mosquitoes and tend to the fascinating plants that house them.

For more than 30 years, educators, researchers, colleagues, and life partners—Bradshaw and Holzapfel—have used advanced genetic and genomic tools to study a single organism known as Wyeomyia smithii. This small, black mosquito develops within the water-filled leaves of the predatory carnivorous purple pitcher plant, Sarracenia purpurea, which thrives in wet bogs and swamps in the eastern part of the US and in Canada.

With the mosquito at the epicenter of their research, scholars at the Bradshaw-Holzapfel lab have made a number of landmark discoveries, including isolating the genes that control biting in mosquitoes. This discovery is an essential step in the eradication of all blood-borne diseases carried by mosquitoes, including malaria, dengue, yellow fever, and West Nile virus. Theirs was the first lab to make the groundbreaking discovery that recent rapid climate change has penetrated to the level of the gene. And they have also recently determined the genetic connections between the seasonal timer that orchestrates how the world looks around us and the daily circadian clock that integrates metabolism and behavior in all organisms.

Passionate about their research, devoted to helping future students achieve their life goals, and committed to building what they've called "a community of scholars" at the University of Oregon, Holzapfel and Bradshaw are giving back to the institution that has supported the greater part of their life's work, research they began decades ago while they were postdoctoral fellows at Harvard University.

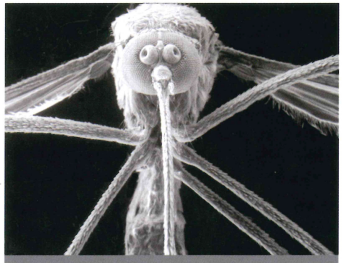


Graduate student Nick Depatie extracts RNA for comparative genomic studies from the brains of mosquitoes. ◂

Their gift will create the Bradshaw and Holzapfel Research Professorship in Transformational Science and Mathematics. This endowed professorship will rotate across the biology, chemistry and biochemistry, physics, mathematics, and computer and information science departments.

"Each department gets to nominate one person and the department heads vote on it," Bradshaw says. "Each department has a vested interest in who gets that award, which means they will read those applications very carefully. This is something for which departments will compete."

Biology major Lauren Goemaat helps tend to the purple pitcher plants in the Bradshaw-Holzapfel laboratory. ◂



Know Your *Wyeomyia smithii*

- In their larval stage, these mosquitoes live submerged in the aqueous reservoirs of their host, the carnivorous, prey-trapping purple pitcher plant, found in wet areas in North American bogs, seeps, or wet pine savannahs.
- The larvae feed on bacteria, rotifers, protozoans, and pieces of deteriorating insects caught by the pitcher plant's leaves.
- Only adult female mosquitoes of any species take a blood meal (bite). These mosquitoes bite in southern North America, but never bite in the North.
- It takes about six weeks to complete their life cycle, which allows them to evolve rapidly and to keep pace with changing environmental conditions.
- Airborne adults may travel, but generally remain near the plants where they emerged.
- They use the length of daylight, or photoperiodism, to determine the optimal time to enter hibernation.
- In direct response to climate change, animals are developing earlier and hibernating later in the year.