

LEARNING FROM FISH

By James Helicke



Mariana Posada '25 and Professor of Biology Jason Breves in Skidmore's aquatic animal facility.

Emma Laquinta '25 and Mariana Posada '25 conducted original research with Professor Jason Breves, a leading expert in comparative endocrinology — all while pursuing their passions in the arts and athletics.

When Emma Laquinta '25 walked into Professor of Biology Jason Breves' Comparative Vertebrate Physiology class, she knew within the first week that she wanted to do more. A biology major on the premedical track, Laquinta had always been interested in how the human body worked. But in Breves' classroom, the systems of fish, amphibians, and mammals revealed a new and complex world she hadn't fully considered.

"The dissections, the lectures, the way he covered everything from fish to people — it was my favorite class I've ever taken at Skidmore," said Laquinta, a senior from Providence, Rhode Island.

Soon after, she joined Breves' lab, where she found herself working hands-on with juvenile Atlantic salmon, studying how the fish adapt to shifting environments. The research, which involved hormonal manipulation to simulate the fish's natural migration to seawater, gave her something she hadn't fully expected: a broader scientific foundation that would shape her future career in medicine.

"I don't plan to be a fish physiologist," she said with a laugh. "But I do want to be a human physiologist — a physician. And the work I've done in this lab is setting up the skills I'll need in med school, residency, and beyond."

Laquinta's story is one of many at Skidmore that reveal a defining theme: Students don't have to pick and choose between seemingly disparate interests; they can do both. While diving into advanced biology research, Laquinta also pursued a minor in chemistry, danced in ballet classes, and became a dedicated member of the men's rowing team — where she serves as coxswain for the varsity eight.

"I always wanted to row, but I was in a pre-professional ballet program in high school," she said. "At Skidmore, I found the flexibility to do it all."

The same holds true for Mariana Posada '25, a biology major who also found a mentor in Breves. Posada also began working with Breves after taking his Comparative Vertebrate Physiology course. Intrigued by the subject matter, she asked to join his research team. One year later, she was listed as a co-author on a peer-reviewed paper — a rare accomplishment for undergraduates at many other institutions.

That study, published with Breves and a fellow student, focused on a protein called anoctamin-1, which had not previously been associated with how killifish maintain salt balance. The team uncovered new insights into how fish regulate salt balance in challenging environments — a question with implications beyond marine biology.

“We used PCR (a laboratory technique that exponentially amplifies specific DNA sequences from a small sample) to quantify gene expression to see how this protein might help fish maintain the right balance of salts in their bodies,” Posada said. “It’s about understanding what helps them survive.”

Posada, who is from Long Island, has long been drawn to science but also found herself craving creative outlets. That’s where Skidmore made a difference.

“I came here because I knew I wanted to study biology, but I’m also really into music,” said Posada, who plays guitar and explores classic rock and pop in her free time. In addition to guitar, she joined Skidmore’s Chinese and Mongolian music ensembles, where she learned to play new instruments. “Being able to do both — that was a huge draw.”

The integration of science and creativity is no accident. Skidmore has invested heavily in its natural sciences, most notably through the Billie Tisch Center for Integrated Sciences, which was completed in 2024. Cross-disciplinary in scope, the facility houses state-of-the-art laboratories and spaces including the aquatic animal facility, where Breves conducts much of his work.

“Fish physiology might sound esoteric,” said Breves, “but the physiological principles we study are foundational across all animals, including humans. It’s a powerful entry point into medicine, veterinary science, and many other fields.”

But perhaps what most distinguishes his lab is the way undergraduates are embedded in every part of the research.

“At Skidmore, students don’t have to wait until graduate school to do real science. They can go from learning the basics to participating in cutting-edge research, sometimes in the span of a year.”

In his lab, students might examine how salt-excreting cells in fish gills function — or fail — under different environmental circumstances. Or, students like Laquinta might travel off campus to administer hormones to juvenile salmon and analyze how their bodies adapt in preparation for life in the ocean.

For Posada, the experience has been transformative. After two years in the lab, she has taken on a mentoring role, helping train newer students to isolate RNA, conduct PCR testing, and apply other molecular biology techniques. She has also been accepted to graduate school, where she plans to continue her studies in biology and physiology.

“The skillset I’ve gained here — both the lab techniques and the ability to think critically — is probably a major reason I got in,” Posada said.

“What I want for my students is the same freedom I had,” said Breves, “to pursue what truly interests them and build a meaningful career around it.”

For Laquinta, that richness has defined her Skidmore experience. After graduation, she’ll spend a gap year as a research assistant at the New York Blood Center before applying to medical school. She plans to specialize in emergency medicine, inspired in part by her work in Saratoga Hospital’s emergency department.

“Skidmore gave me the chance to explore every side of myself — the scientist, the athlete, the artist,” she said. “And the mentorship I’ve had here, especially from Dr. Breves, has made all the difference.”

In Breves’ lab, the research stream may begin with fish, but it leads students toward a much broader current of science and discovery.

MAKING SCIENTIFIC WAVES

Professor of Biology Jason Breves was recently awarded the prestigious Grace E. Pickford Medal from the International Federation of Comparative Endocrinological Societies. He is the first recipient from a liberal arts college to receive the honor.

His research focuses on comparative endocrinology — the study of hormones across animal species. In particular, he has examined the role of prolactin in helping fish maintain salt and water balance; his findings have informed a broader scientific understanding of prolactin-regulated pathways in the human kidney. Separately, Breves has identified how the actions of growth hormone are disrupted in salmon exposed to pollutants — with implications for the survival of affected salmon.

“At its core, my research aims to understand how animals adapt to their environments,” Breves said. “We can apply that knowledge to understand human and animal disease and how long-term environmental changes affect the health of wild animals. This knowledge also informs the design of technologies that seek to rear animals more sustainably.”

Breves accomplishes much of his research in collaboration with Skidmore students.



Emma Laquinta '25 joined Professor of Biology Jason Breves on a research trip to the Conte Anadromous Fish Research Lab in Massachusetts, where they administered hormone treatments to juvenile Atlantic salmon to simulate the internal changes that fish experience during their spring migration to the ocean.



video:

Emma Laquinta '25 and Mariana Posada '25 discuss their Skidmore experiences, including their research with Professor of Biology Jason Breves.

