

Meet undergraduate ISU researcher, Aaliyah Tovar



Aaliyah Tovar, an undergraduate student majoring in biology (biomedical sciences) at Idaho State University, wasn't interested in research early on in her academic career. According to Tovar, a college education was only for people who wanted to become a doctor, lawyer, or teacher. She notes that within her community of Rupert, Idaho, no career avenues, other than agricultural or automotive, were really discussed within her family.

“My parents never really got too much of a say in their futures, “ states Tovar, “Both my parents went right to work after high school to support themselves and a baby. From then on, their aspirations for me were to graduate high school, attend college, and to find a stable job.”

As a high school student, Tovar found that she enjoyed biology classes and eventually decided to go to ISU as a pre-med student majoring in biology.

Tovar states that she had never really given much thought about the concept of research, however, as she began to take more classes, the topic of research came up various times and the idea of becoming engaged with a research project began to take hold. According to Tovar, “STEM outreach was particularly weak at my high school, and the concept of academia and research seemed surreal. Research was mysterious and the concepts involved seemed abstract which only furthered my curiosity.”

Tovar began looking at various research opportunities at ISU and was introduced to the world of research by her major advisor, Heather Ray, ISU Associate Professor in Developmental Biology. Tovar was offered an opportunity to work in Ray's lab which focused on developmental biology and the impact gene mutations have on early development.

Having some knowledge of development through her high school healthcare courses, the opportunity spurred Tovar's interest, not only in Ray's lab but in the world of research. Tovar states, “While I had a weak understanding of the different concepts involved, I became encouraged to broaden my knowledge.”

A semester later, Tovar was offered a GEM3 Summer Authentic Research Experience (SARE) position in Ray's lab and jumped at the chance to connect with other researchers and delve deeper into research throughout the summer. The focus of the SARE project was to examine how the loss of function in Masp 1, a protein coding gene, impacts gene expression and how these changes are involved in craniofacial defects and developmental disorders (see research detail in shaded column).

“Research has allowed me to build up confidence in myself and my capabilities,” notes Tovar. Working under the guidance of her faculty mentor, Tovar was eventually named the lead of the research team on the Masp 1 research project and is now serving in a mentor position as well. “As a mentor,” explains Tovar, “my role is to help explain to mentees the background of the project, how to conduct the experiments, and to explain the purpose of the different processes involved.”

Through SARE, Tovar was able to meet and work with students from various colleges. Tovar was also able to participate in the Idaho Conference for Undergraduate Research (ICUR) in Boise, ID over the summer to present her research. She also recently presented her research at the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) conference in October, with ICUR providing travel support.

Currently, Tovar is still participating in research and hope to continue doing research in the future as a way of preparing for her future career. “Through research I have been able to find mentors amongst professors and peers who help me better myself academically and as a person,” notes Tovar. Tovar is set to graduate in Spring 2024, and plans to continue on her path of becoming a doctor in a Hispanic community.

About the SARE research:

Project: Gene expression changes in response to Masp1 loss of function (Faculty mentor: Heather Ray, ISU)

Overview: This research project is examining how the loss of function in Masp 1, a protein coding gene, impacts gene expression and how these changes are involved in craniofacial defects and developmental disorders.

Background: Developmental disorders are inherited and involve mutations in an individual's genetic makeup. These mutations cause a gene to lose control and impact its function. This can lead to disrupted physical development and cognitive impairment. By studying the importance of Masp 1 during development and by confirming whether or not it has a role in causing 3MC syndrome (a disorder characterized by unusual facial features and a variety of problems affecting other tissues and organs of the body), can spur attention towards generating prevention treatments.

Within Idaho, statistics show that more than 22,400 babies are born yearly. Of these babies, it is found about 1 in 5 of infant deaths is due to birth defects. Those living with their defects, while alive, may have a lower quality of life due to physical ailments and or impaired cognitive abilities.

The team hopes to find evidence confirming how mutations in the MASP 1 gene could lead to a developmental disorder through its impact on genes important for structuring the craniofacial bones. By understanding how development is disrupted by genetic mutation, they can eventually figure out ways to prevent these disorders from occurring.

“With this in mind, research investigating the causes of birth defects and how to prevent them is important in bettering the lives of Idahoans.” ~Aaliyah Tovar



This series is funded by the National Science Foundation Idaho EPSCoR Program under award number OIA-1757324