

DATA VERSIFY

Jamie Walters

Researcher Background:

Jamie Walters (he/him) studies evolutionary genetics and genomics at the University of Kansas. The Walters lab researches how differences between males and females shape the evolution and function of genomes. They focus on moths and butterflies because they have distinct features in their genomes and reproduction that can provide important contrasts to more commonly studied organisms (like mammals or flies).

Q: How would you describe your science to a 5th grader?

A: My research aims to understand how genes change over time in males versus females. Some genes work in males, but not females, and vice versa. This also includes understanding how the X and Y chromosomes (a.k.a. "sex chromosomes") evolve in different ways than "normal" chromosomes (called autosomes). Males and females inherit the X and Y chromosomes in different ways, but they inherit autosomes in the same way. Because of these differences, we expect that the X and Y chromosomes may show different patterns of genetic changes compared to autosomes. We collect and study genetic data to see if we can find these predicted patterns in DNA.



Jamie in the lab doing genetic extractions (left) and with one of the butterfly species he works with (right).

Q: Why did you become a biologist?

A: I have always loved learning biological facts, even when I was a kid. I had a coloring book of fishes when I was around 5 years old that I was obsessed with, which is the earliest thing I can remember about just being fascinated by biology in a general sense. I love learning natural history, and all the cool stories about how organisms have adapted to life in various conditions in countless fascinating ways! This is what led me to focus on studying evolutionary biology in particular -- it offered a way to explain why organisms were so different! Then, as my studies progressed in the 2000's, when genome biology was growing rapidly, I discovered that there is as much fascinating

diversity found among genomes as there is among colorful fishes or different insects. So, I focused my research on understanding the evolution of genomes. But it is still the case that I fundamentally love hearing about and helping to tell the stories about biological diversity, and this is what keeps me motivated to work as a biologist.

Q: What is your favorite part about your job?

A: I work as a professor at a large research university, running a lab. There are several things about this job that I really like. One of the most exciting and satisfying parts is analyzing new data: writing code, running statistics, and making plots to make sense of what the data has to tell me. I love "digging into the data"! But I also am very grateful for the opportunities I have had to travel, visit, and even live in different parts of the world due to my job. I have collected butterflies in the jungles of Peru and Panama, attended conferences in Crete and China, and lived for a year or more in both England and Czechia. These international experiences and adventures have been a wonderful "bonus" on top of getting to do the science.

Q: Do you have any aspects of your identity that you feel are underrepresented, marginalized, or minoritized in STEM or society?

A: I have type-1 diabetes, which is a federally recognized disability.

Q: What obstacles have you overcome to get where you are?

A: One common obstacle I've faced -- as I know many other scientists have -- is encountering the limits of your own knowledge and expertise. Working as a professional researcher means you are constantly having to learn new information and gain new expertise. Being good at teaching yourself new skills and knowledge is important. But equally as important is being able to develop good collaborations with other researchers who have complementary knowledge and expertise. For instance, I've often worked with experts in statistical analyses to help me with interpreting and analyzing data that I have. So I would say that learning to work collaboratively in doing science is a very important way to overcome the limitations of your own knowledge and expertise.

Q: What are hobbies and/or interests that you have outside of your research?

A: I really love outdoor "adventure" sports like hiking, biking, skiing, and kayaking. Among these, my favorite is whitewater kayaking. In fact, after college and during graduate school, I worked professionally as an instructor and guide for whitewater kayaking, so it wasn't "just" a hobby at some points in my life.



Q: What is your favorite thing about kayaking?

A: There are many aspects of whitewater kayaking that feel very special to me. Partly it is the magical physicality of learning to harness the power of the river to navigate a little boat through big waves and rapids. Partly it is gaining the skill and confidence to safely do something that could be considered very risky. And partly it is the awesome sense of community and connection that exists among other whitewater kayakers.



Jamie in the field with a butterfly net.

Q: What advice do you have for aspiring biologists?

A: I always recommend that you should make an effort to learn statistics and computer programming along with biology. Knowing a lot about biology, and taking biology classes, is essential for being a biologist. But biologists who also are good at math, statistics, and analyzing data with computer coding have a real advantage. I always wish I had started studying statistics and computer coding much earlier than I did (which was only part way through my Ph.D. graduate studies). It may seem that statistics and computer coding are not very important compared to learning ecology or genetics, for instance. But as soon as you want to actually do something with your knowledge of biology -- to collect data and make inferences -- you will need these other quantitative skills. So best to start learning them alongside the biology!

Q: What do you believe are key elements that contribute to being successful in biology?

A: I think "success" in biology -- and many other sciences -- requires achieving a good balance of being detail-oriented while also thinking about the big-picture. You need to understand the details and quirks of biological systems and methodologies to effectively generate and usefully interpret the data. However, you also need to understand why your research is important in the grand scheme of things and what the major implications are for the work. I really admire scientists who are able to balance the technical and conceptual parts of their research, and emphasize or focus on each part as needed. For instance, if you want to write a successful grant, you have convince the funders that what you propose to do is important (big-picture thinking), but also that you know how to collect and analyze the relevant data (technical details).