

To explore the fascinating world of glycobiology and the crucial role of glycans (sugars) in understanding human health and disease, we'll take a closer look at the work of Terrell Carter. Terrell is a PhD candidate at the University of Georgia and in the Department of Biochemistry and Molecular Biology. Terrell conducts his doctoral research in the lab of Dr. Lance Wells at the Complex Carbohydrate Research Center, where his work focuses on enzymes important in making glycans that are essential for proper muscle function. By examining how these enzymes work, Terrell seeks to understand how they contribute to muscular dystrophy to aid in the development of muscular dystrophy therapies.

Learn more about Terrell's journey in this interview with him:

Did you always want to be a scientist? How did you get interested in glycoscience in particular? I have always imagined myself doing something like this to be honest. Ever since I was little, I thought I would end up in a career like science, so being at this stage of my PhD feels pretty amazing. It never really gets lost on me that I'm getting close to a goal that I've had for a long time. My interests in biology have always been driven by real-world applications, especially biofuels and biomaterials. I liked the idea that biology could translate into something tangible and useful.

During undergrad, glycobiology wasn't talked about much, so it felt less visible – like a niche area. It wasn't until I got into graduate school that I really discovered glycoscience and that was a big turning point for me. Now, it feels obvious that there's no biology without glycobiology. Looking back, my interest in biofuels naturally connects to glycoscience, since working with sugars and the enzymes that break down or modify them is central to both. I didn't come into grad school knowing I would work in glycobiology, but once I got here, everything clicked.

Can you tell me a bit about your journey? Were there any unexpected twists? My academic journey definitely hasn't been a straight line. One of my biggest deviations was serving in the Army National Guard while I was still an undergraduate student. Balancing military service with school took a lot of time and made my academic path more complicated than I expected. After graduating, I continued serving and was deployed, which meant spending additional time away from a traditional academic environment before fully returning to research and graduate training.

My military experience pulled me away from academics at times, but it also gave me space to reflect on what I **really** wanted and what I believed was possible. It pushed me to seriously consider whether I could pursue an academic career and ultimately convinced me that earning a PhD was within reach so long as I have the willingness.

When I was ready to return to academia after my service, I knew I wanted more research experience, and a clearer sense of what graduate school would actually be like. That led me to a post-baccalaureate research training program known as PREP, which ended up being a truly transformative experience for me. Even though the program lasted only a year, the mentorship, hands-on research, and intensive training had a lasting impact on how I see myself as a scientist. It gave me practical research skills, exposure to new techniques, and the confidence that I belonged in graduate school. Even today I still rely on what I learned during my time as a PREP scholar. Looking back, the twists in my journey weren't easy, but they played a huge role in shaping the scientist I'm becoming and in giving me the resolve to commit fully to a career in research.

How did you know that glycoscience was the right field for you? For me, figuring out whether glycoscience was the right field came down to thinking about what's important to me and where I want to go long term. I try to step back every so often and ask whether the work I'm doing actually lines up with the kind of scientist I want to be and the kinds of problems I care about. Like I mentioned earlier, I have always been really passionate about areas like biomaterials and biofuels and over time I realized that glycoscience sits right at the center of those interests. If you want to understand, build, or modify biological systems, especially from an enzymology perspective, there really isn't a better field to be in. Working in glycoscience allows me to study enzymes and sugars in a way that feels both fundamentally interesting and broadly applicable. Once I saw how well the field aligned with my interests and goals, it became clear that this was the right path for me.

Is there anything else you think is important for people to know about glycoscience or being a glycoscientist? One thing I always tell people is not to be intimidated by glycoscience. It might seem overwhelming at first, but once you get into it, it's actually really fun! The more I read literature and listen to talks at conferences and seminars, the more surprised I am by how involved glycans are in almost every aspect of biology. It really does start to feel like there's no biology without glycobiology! In my own research, losing a single glycan on a protein can lead to something as serious as muscular dystrophy, which really highlights how important this area of study is. It's just really hard to imagine biological systems working properly without glycosylation. Glycoscience is also incredibly applicable and interdisciplinary. Many biologic drugs simply don't work without proper glycosylation and the field needs expertise from all areas, from biologists and chemists to computational scientists and engineers. There's still so much left to discover, including new pathways and even new sugars, which makes being a glycoscientist both exciting and full of possibility.

Could you tell me some hobbies or interests that you have outside of the lab?

Like most grad students, finding time for hobbies can be tough, but I've picked up a few that help me unwind. One of my favorite hobbies since starting graduate school has been playing tennis. There's always something new to learn, and I love how low-pressure and social it can be! You can grab some friends, hit a ball back and forth, and just enjoy being outside and moving around.

I've also been really into learning languages. I've picked up Portuguese and am working on improving my French, with a little Spanish mixed in too. On the nerdier side, I actually enjoy studying math for fun—I spent one summer working through Calculus III just because I felt like it. More recently, I've been teaching myself Python, especially for machine-learning applications. It's been a fun way to think differently about data and problem-solving, and it's definitely given me a new appreciation for people who do computational work for a living.