To explore the fascinating world of glycobiology and the crucial role of glycans (sugars) in microbial pathogenesis, we'll take a closer look at the work of Dr. Tamara L. Doering. Tamara is the Alumni Endowed Professor of Molecular Microbiology at Washington University School of Medicine, where she leads research into *Cryptococcus neoformans*, a fungal pathogen that primarily affects people with weakened immune systems. Her lab focuses on the organism's sugar-rich polysaccharide capsule, the key to its ability to evade the immune system. By digging into the glycobiology of capsule and cell wall synthesis, her team explores how sugar structures as well as enzymes called glycosyltransferases contribute to the pathogen's virulence. The lab also investigates how *C. neoformans* interacts with its host. Dr. Doering's work sits at the intersection of microbiology and glycoscience, revealing how sugar coatings can make all the difference in the battle between pathogens and their hosts.

Learn more about Tamara's journey in this interview with her:

Did you always want to be a scientist? How did you get interested in glycoscience in particular? I didn't set out with a grand plan to become a scientist, but looking back, it makes perfect sense. I was raised in a family where both my parents had PhDs (in chemistry and sociology), and dinner table conversations were full of curiosity and critical thinking. It was a Brady Bunch-style household with kids coming and going, and our dinner conversations often turned into mini-debates. Someone would say something, and someone else would ask, "What do you mean?" or "How do you know that?" I remember a cousin once joining us and saying, "You guys are really weird." So, I was immersed early on in an environment that, in hindsight, encouraged a very scientific way of thinking. Becoming a scientist wasn't a conscious decision – it kind of just felt like the natural thing to do.

My path into glycoscience was full of chance encounters. As an undergrad, I ended up in Dr. Saul Roseman's lab by accident because his lab was on the hallway where I had my first lab job. Although he was a pioneer in glycobiology, I didn't work on anything glycan related – I was just helping with cloning and sequencing. It wasn't until my MD/PhD that things really took shape. I joined Dr. Paul Englund's lab to study African trypanosomes, parasites responsible for African Sleeping Sickness, and through a collaboration with Dr. Gerald (Jerry) Hart, I ended up working on GPI anchors, which are lipid "anchors" that help attach proteins to the surface of cells. That project and the positive exposure to people like Jerry, Dr. Bob Haltiwanger, and other glyco "giants" started pulling me into the field.

As I neared the end of medical school, I decided I wanted to do research full-time. To choose a postdoc, I spent a lot of time reading and exploring different fields by talking to faculty about exciting new research. My interest in how molecules move around inside cells led me to join Randy Schekman's lab. Although my initial project didn't pan out, I returned to studying GPI-anchored proteins, but in model yeast. When it came time to apply for faculty jobs, I wanted to return to working on a microbe that caused disease. This led me to the idea to keep studying GPI-anchored proteins, but in a pathogenic yeast. Even choosing *Cryptococcus neoformans* was a bit serendipitous. I was looking

for a pathogenic fungus to study and grabbed a few reviews from the library because, you know, back in the day there was no internet. *Cryptococcus* stood out, although I didn't realize then its many differences from model yeast. Once I started studying its enormous polysaccharide capsule, which is a thick coating made of long chains of sugar molecules, I was hooked! Over time, my work on bacteria, parasites, model yeast, and pathogenic fungi formed a very unexpected but unified theme centered on microbial glycobiology. It definitely wasn't planned. A mix of curiosity, mentorship, and lucky breaks led me here.

Can you tell me a bit about your journey? Were there any unexpected twists? Life's twists profoundly shape your trajectory in ways you often have to navigate carefully. For me, a major factor was my personal life – especially my relationship with my now husband of 27 years, who was a faculty member at Johns Hopkins University during my postdoc at Berkeley. Although I had long planned my career path and moved to California for my postdoc, after commuting cross-country for years I decided to focus my job search mostly on the east coast so we could be closer. My choice of faculty positions wasn't just personal - it shaped the science I did, the questions I pursued, and the collaborations I formed. In academic research, your professional environment plays a huge role in influencing what directions you take. I definitely gravitated toward particular questions and opportunities based on who I was working with and the kinds of conversations happening around me. I've also come to understand that success isn't one fixed path. It's about defining your own priorities, accepting that plans will change, and sometimes taking a pause to figure out the best way forward. Books like *The Midnight Library* remind me that every choice leads to different outcomes and, even if you wonder "what if," the alternate path might not have been better. Ultimately, balancing personal and professional priorities shapes not only your career but your whole life, and there are many ways to find fulfillment.

How did you know that glycoscience was the right field for you? Well, I think what's really nice is that it is such a supportive field. Glycoscience has grown a lot since I was a student. Although I may not know all the newer people coming in and they may not know me, the sense of community remains strong. From early on, I had inspiring role models, including brilliant scientists like Jerry. I also saw that women visibly contributed to the field – people like Pamela Stanley, Ten Feizi, and Anne Dell. Even though there weren't many, seeing women on the podium made a lasting impression and helped shape my sense of belonging.

Is there anything else you think is important for people to know about glycoscience or being a glycoscientist? I think people tend to be afraid of what they don't know, right? That's classic human behavior. So, they're afraid of what's unfamiliar. They're like, ooh, carbohydrates! How do you even think about them? What do you do with them? How do you study these? But you shouldn't be afraid of what you don't know. As I mentioned, it's an incredibly welcoming and well-rounded community that touches all kinds of fascinating biology. That broad scope is both a strength and a challenge. From the outside, it can feel unfamiliar or intimidating, but on the inside the range of topics is vast and diverse. That's also what makes it exciting, especially for

people with the curiosity and insight to connect the threads across the field and uncover new ideas.

Could you tell me about some hobbies or interests you have outside of the lab?
Outside the lab, I love being outdoors and hiking even though I'm not into organized sports. I also really enjoy music, especially discovering new artists through playlists my 20-year-old son curates for me. Recently, we went to see Sammy Rae & the Friends live, which was a blast. I also love to dance, cook, entertain, and play board games with my family. We are big into complex games like Gaia Project and Frosthaven. I am also in a book club with other women scientists, where we read a wide mix of genres – or sometimes just skip the book talk altogether if we aren't that into the book!