Interview with Laura Kiessling, Fellow of the American Academy of Microbiology

Dr. Kiessling's research focuses on synthetic ligands and using synthesized ligands to explore biological recognition processes. Dr. Kiessling is at the University of Wisconsin, Madison.

Did your research evolve in this direction or is this the kind of work you've wanted to do all along?
It evolved in this direction. Before I actually became a professor I was interested in microbes, but I didn't really know that much about them because I came from a synthetic chemistry background. As a synthetic chemist, most of what I knew about microbes was their ability to make these interesting natural products. They were like tools to me. But then I came here to Wisconsin and my colleague Julius Adler was working on chemotaxis, and I got interested in how microbes, especially bacteria, sense signals in their environment, especially sugar signals. I've also become interested in the role of some very unique carbohydrates in the cell wall of *Mycobacterium tuberculosis*.

Where is the tuberculosis work going?
We're really interested in a form of galactose, called galactofuranose. We've been interested in finding inhibitors of galactofuranose incorporation.

Has synthetic chemistry seen the development of new technologies in recent years or are scientists stuck with recombining existing techniques?
There are a lot of new methods. Synthetic chemistry is really powerful – it can make a lot of different kinds of compounds. One thing people have gotten good at is creating new libraries of compounds. You can use those libraries to identify new compounds that can be used as probes. That's one area that's really grown a lot. We've also been able to develop the tools to create far more complicated compounds than before.

Would you call yourself a microbiologist or a biologist or a chemist – or something else?
Probably "chemical biologist" is the term that most people would use. I kind of like it because no one really knows what that is. It's hard to put you in a box. People say, "Oh, you're a chemical biologist. Interesting…" It's a conversation starter or stopper depending on who you're talking to. It's good to be classified, because it aligns you with a certain group with whom you share a certain interest, but it's nice to not be classified sometimes, too.

What's the biggest challenge in your work?
If you have training in one area and are trying to move into another area, like I am, you're always outside your comfort zone, you're always trying learn new things on the fly. That's energizing, but it's hard. As a graduate student, I focused on how to build molecules, and what the molecules did, per se, was less interesting to me than how to build them. And when I switched from that perspective to asking, "What are the important questions?" and how can I best solve them, that was a change. Not only in the background and the knowledge I needed, but completely in my scientific perspective. When you run an interdisciplinary lab, there are challenges associated with that, too. You want to make sure your students have good training in a discipline, but that they also appreciate the relatedness of science.

What do you think is the most understudied microbial system?

Honestly, I think in molecules and not so much in organisms. So if you ask me about molecules, I can list some of my favorite molecules for you. I love sugars and oligosaccharides and trying to understand their biological roles is a really big challenge.

What advice would you give students about life as an academic microbiologist?
I think academic life is great because it's so flexible. The other thing I think people don't realize is how much fun it is to see how your students mature as scientists. "Proud" isn't the right word for it. It is really exciting when one of your students goes off and has their own independent career in academia or industry or some other setting.

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