

A CLASS ACT

TODAY'S BIOSCIENCE STUDENTS PREP FOR TOMORROW'S CHALLENGES

BY DOUG MCPHERSON

When little Kaitlyn Mulhern was 6-years-old, growing up in Boise, Idaho, she got a birthday gift that put her career into sharp focus. Yep, a microscope.

"I know it's totally cliché, but it's true," says Mulhern, a Colorado State University graduate student in biochemistry. "I was always collecting random bug and plant specimens to look at under the microscope."

Mulhern was hooked. "Science is exciting, fast paced and always advancing," she says. "When you take a step back and think about the

potential this research has to save lives- it's incredibly gratifying and motivating."

And today she's getting hands-on experience saving lives. As part of her internship at Inviragen, a biotech company in Fort Collins that develops several vaccines, she's working on a Dengue Fever Vaccine. The Dengue Fever is often spread by mosquitoes, and is viral and often fatal. Mulhern explains she's developing an assay to molecularly characterize the final vaccine product. "It's an exciting time for Inviragen and I'm thrilled to be a part of it," she says.

As a sophomore, Mulhern interned at the California biotech giant, Genentech, and worked in late-stage purification and tested a high-pressure system used to refold proteins and compare to the original protocol. "I also got to see the entire process of getting a drug to market ... it was an incredible experience."



Van Willis



Kaitlyn Mulhern

Another student, Van Willis, is studying molecular biology at the University of Colorado Denver Anschutz Medical Campus. He, too, says he's in the field to make peoples' lives better. "I want to apply my scientific training to help great ideas become

products and applications that improve lives."

In one of his classes, Willis designed a complete clinical trial from the ground up. "I learned how much time and money clinical trials really take and the great responsibility for patient safety; plus, how all the research steps leading up to clinical trials are an integral part of the clinical trial itself, and why you need an excellent plan in the pre-clinical phase."

Willis also presides over the Alternatives in Science Club (AIS), a student-run group that focuses on career development in science outside of academia (more on AIS and career development in a minute). He says his work there has helped him appreciate the regulations of research and manufacturing. "It's given me the big picture of why the regulations are in place and the purposes behind why the bioscience industry operates as it does."

And then there's Misty Rowe-Konopacki, a post-doctoral fellow in applied chemistry at Mines, whose studies led to her co-founding TheragNos, an early stage biotech company in Golden. The company works to dramatically improve the therapeutic outcome of both the imaging and treatment of many diseases. Today Rowe juggles both the business and research sides of biotech: writing proposals, getting investors and working in the lab.

Rowe-Konopacki was originally a pre-med undergrad but in her senior year she got the chance to develop potential breast cancer drugs as a research



Misty Rowe-Konopacki



status but lack funds. They're looking at sources for cash including grants and industry sponsorships. "We have to make sure the funding is sustainable," Meyers says.

If it does happen, Willis says the program would feature specialized courses in bioscience along with patents, regulatory affairs, business among others, and plenty of interaction between students and bioscience industry leaders via internships and guest speakers.

In the meantime, Willis says AIS is connecting local bioscience companies and industry pros with students through monthly question-and-answer sessions and "matchmaker" meetings where employers introduce their companies and employment to students. To learn more, visit www.aiscolorado.org.

For the longer-term future, Meyers says he believes there are three keys to adding more scientists from schools to the job pools: "We know you need math before you can learn science; we need to reach students before and during middle school and we have to have parental involvement."

Despite any labor force shortfalls, Willis is bullish on Colorado's future: "Colorado bioscience is poised to continue growing. Whether it will do so with an influx of Colorado's best students hinges on the ability of Colorado's bioscience sector to connect with local universities to share essential information and training."

Willis can count on Mulhern. She says after grad school, her aim is a doctorate in biochemistry or molecular biology. "After that, I'd love to come back to Colorado and work at a biotech company. Colorado has so many start-up companies ... that have huge potential to do great things for people. I know this is the right place for me."



project. "That sent me down the bioscience research road," she says. "I'd learned that while physicians implement the cures, the true innovation comes from those who are doing the base level research."

FROM SCHOOL TO JOB POOL

All three are first-class examples of the faces in the future of bioscience. Faces Arlen Meyers, M.D., would like to clone to keep students streaming out of colleges with degrees in the sciences to fill Colorado's need for employees.

"Clearly, there's a demonstrated need in Colorado and elsewhere for bioscience talent,"

says Meyers, a professor of otolaryngology at CU-Denver and an activist in growing Colorado's scientific workforce. "A lot of scientists are going for academic jobs, but there aren't any.

That leaves students who've studied biosciences, but who lack the skills they need to work in the industry outside of the classroom. Willis says Colorado students "face a difficult transition" from academia to bioscience.

One way Meyers hopes to solve the problem is through a kind of biotech/ entrepreneurship and internship program. He and Willis have the program near liftoff



Arlen Meyers