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A Transformative Experience

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Scientists working at Kansas State University’s Biosecurity Research Institute aren’t just studying the disease-causing pathogens threatening the health and food supply of the nation today — they are also training the next generation of researchers in the field.

Several Kansas State University students are earning opportunities to assist with the institute’s research projects and enhance their career prospects.

Just as faculty must do, these students must also complete a rigorous training process before entering the institute. Raymond “Bob” Rowland, a virologist and professor of diagnostic medicine and pathobiology, maintains laboratories in the Biosecurity Research Institute and the College of Veterinary Medicine. His college laboratory employs around 20 students and is a good indicator of those capable of the institute and the research.

“Many of the undergrads who work for me do so for three or four years,” he said. “After four years they have an incredible amount of experience. They’re capable of working in containment, provided they can handle all of the training.”

Limitations still exist for students in the Biosecurity Research Institute. Rowland prohibits student researchers from working with agents that could infect humans.

Benjamin Trible, doctoral candidate in diagnostic medicine and pathobiology, has benefited from Rowland’s willingness to permit properly trained students to participate in research. Trible began working with Rowland in 2006 as an undergraduate and advanced to research in the institute, where he assisted with the development of a vaccine for swine disease. His experiences were so positive that they had a bearing on his career plans.

“When I began working with Dr. Rowland, I was premed,” Trible said. “But working in virology lit a fire for me. I was going into the field and seeing clinical cases. I like genetics and I like research in the laboratory. That was the shift that led to virology.”

Trible currently works in both of Rowland’s laboratories. In addition to working with Rowland, he also works with the undergraduates and uses his own experiences and knowledge to inspire the future researchers.

“I believe that working with the undergraduate students has cemented what I’ll be doing in the future,” Trible said. “I really enjoy teaching the undergraduate students and I believe that’s what I want to do with the rest of my life — teach and do research.”

Also ascending from lower-security level laboratories to the institute is Donka Milke, master’s student in food science and industry.
As an undergraduate, Milke conducted research with Randall Phebus, professor of animal sciences and industry, in his laboratory in Call Hall, beginning in 2010. Not long after, Phebus began training Milke for research in the Biosecurity Research Institute.

Milke assisted Phebus in the Big Grind project, which studied the distribution of food-borne pathogens in ground beef during the manufacturing process.

Milke's experiences at the institute have played a major role in her future. She plans for a job in food safety after receiving her master's degree.

“I’m extremely glad that I have been able to be a part of the Biosecurity Research Institute, even if it was briefly,” Milke said. “For an undergraduate student such an experience can be a steppingstone and help you decide your career path. This has been an important deal for me.”

By Tyler Sharp, Communications and Marketing

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**Student researcher training process**

Before working in the Biosecurity Research Institute, students must:

- Complete a three-day training course featuring significant information on processes, procedures and laboratory protocol.
- Finish a hands-on training session to prove they are comfortable working in a laboratory-type setting.
- Pass a background check.
- Complete any additional requirements determined by the researcher.
- Complete training annually.
Stephen Higgs

As research director of the Biosecurity Research Institute, associate vice president for research and Peine biosecurity chair, Stephen Higgs is strengthening existing research programs and developing new opportunities for future research at the institute. With the university’s 2025 Visionary Plan in mind, Higgs is helping the institute become internationally recognized for research on animal and plant diseases, food safety and security, and related public health issues.

He has a doctorate in ecological parasitology from Reading University and a bachelor’s in zoology from King’s College, both in the United Kingdom. He has worked for infectious disease laboratories at Colorado State University and the University of Texas Medical Branch. From 2005 to 2011, he was director of the Center for Biodefense and Emerging Infectious Diseases at the University of Texas Medical Branch—a biosafety level-3 insectary.

“An important aspect of the Biosecurity Research Institute is that it has a unique combination of multidisciplinary research and educational capabilities all under one roof,” Higgs said. “Since these are available to faculty, staff and students from many departments and colleges, we can facilitate collaborative work that can give the university a competitive advantage over other academic institutes when we apply for grants and contracts.”

Julie Johnson

With safety as her first priority, Julie Johnson is the Biosecurity Research Institute’s biosafety officer, assistant vice president for research compliance and responsible official for the campus select agent program. She coordinates animal care and manages laboratory support services to ensure that the institute and university are compliant with all safety regulations and guidelines. She also coordinates annual biosafety and biosecurity training programs for personnel and support staff at the institute.

Johnson has a doctorate in molecular, cellular and developmental biology and a master’s in biochemistry, both from Iowa State University. She received her bachelor’s in chemistry from St. Olaf College in Northfield, Minn., and she is a certified biological safety professional by the American Biological Safety Association. She worked for Iowa State University as the responsible official for select agent use from 1997 to 2006 and as the biosafety officer from 1996 to 2006.

“A lot of forethought goes into designing an infectious disease lab like the Biosecurity Research Institute,” Johnson said. “One of the ideas that makes the institute different from a non-containment lab is our annual training program. You can’t engineer out human mistakes, but if you continuously train people it will help. We’re really fortunate to have the training lab that we do.”

Scott Rusk

As director of Pat Roberts Hall—home of the Biosecurity Research Institute—Scott Rusk is responsible for the policy and management of biocontainment facilities in support of the institute’s infectious disease research programs.

He has a master’s degree in veterinary microbiology and preventive medicine from Iowa State University and a bachelor’s in biology from the University of Northern Iowa. He was associate director and operations manager at the institute from 2006 to 2007; the biocontainment operations and management specialist at Flad Architects from 2003 to 2006; and assistant director of the U.S. Department of Agriculture’s National Animal Disease Center, Ames, Iowa, from 1999 to 2003, where he also served as director of environmental health and safety from 1992 to 1999.

“The Biosecurity Research Institute provides new opportunities for enhanced research programs at the university,” Rusk said. “The biocontainment capabilities are unique, which contribute to continued growth and leadership in the areas of agriculture and public health.”