



The new bio home

at Argonne

By Megan Seery

The Latin names conceal the peril within: *Yersinia pestis* and *Bacillus anthracis*. To non-scientists, they are known as plague and anthrax—words that have struck fear into the hearts of many.

Now, University of Chicago researchers will study such virulent killers at an elite, government-sponsored facility, the Howard T. Ricketts Regional Biocontainment Laboratory, a place where fingerprint-scanning security, Tyvek uniforms and latex gloves will be part of daily routines.

State-of-the-art security is in place at the new building, which will be run by the University of Chicago and function as one of the few U.S. labs capable of safely working with viruses and diseases such as West Nile virus, anthrax and plague.

“These measures look like overkill to everyone else, but when you work with this kind of stuff, they make sense,” said Lauriane Quenee, PhD, a microbiologist and one of a handful of University of Chicago researchers chosen to open the facility on the campus of Argonne National Laboratory.





Located 25 miles from the university's main campus, on Department of Energy land, the \$32.4 million, 54,100-square-foot Ricketts Lab is **part of a larger biodefense initiative** launched by the National Institutes of Health in 2003 to develop drugs, vaccines and diagnostics that counter bioterrorism and emerging infectious diseases.

"We're talking about food, water and air," Quenee said. "If you are a bioterrorist, you don't want to waste time stabbing people with needles. To do maximum damage, you want to create something that spreads quickly and affects a large number of people at once."

Ricketts Lab researchers will study microbial organisms classified as either Risk Group 2 (agents that cause mild to moderate symptoms in humans but are not life threatening) or Risk Group 3 (agents that have the potential to cause lethal human infections but have at least one effective treatment). The building, named after renowned University of Chicago pathologist and "microbe hunter" Howard Taylor Ricketts (1871-1910), is among the 13 labs funded for the biodefense initiative. It is a step down from the two Risk Group 4 facilities, one in Massachusetts and one in Texas, approved by the NIH for the purpose of studying the most severe pathogens.

All organisms that will be studied at Ricketts are treatable with antibiotics, said Olaf Schneewind, MD, PhD, chairman of microbiology and director of the Great Lakes Regional Center of Excellence for Biodefense and Emerging Infectious Diseases Research (GLRCE), a consortium of 27 research institutions in the Midwest. Work at the Ricketts Lab will support GLRCE, which also is funded by the NIH through the National Institute of Allergy and Infectious Diseases.

Animal technicians are among 24 staff members who will open the site initially, Schneewind said. Over time, the building may house up to 75 employees, ranging from security guards to scientists. As a safety precaution and to limit access to the building researchers stationed there will clean the facility themselves.

Air flow will be controlled by High Efficiency Particulate Air, or HEPA, filters that suck up and screen out airborne particles before the air is released outside.

Protecting the public from destructive diseases also means shielding the scientists who study them. In addition to their suits, Ricketts researchers will be required to take showers every time they leave the level 3 laboratory.

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Joseph Kanabrocki, PhD, assistant dean for biosafety and associate professor of microbiology

"We'll have enough space to coordinate this and allow people to test their vaccines in a contained environment," he said, even if it's not for a University of Chicago-led project.

Working at Washington University in St. Louis during the 2001 anthrax scare, Kanabrocki said he received about six calls a day asking him to clean up Coffee-Mate, which resembles the white powder identified during the scare. Since those anthrax cases, in which five people died and more than a dozen became ill from contact with the substance, the government has channeled millions of dollars into research

at universities and other institutions to study the bacteria and other potential biological weapons.

"Had this kind of center existed then, it would have been used as a place where diagnostics were set up and investigated," Kanabrocki said.

The Ricketts building includes 3,904 square feet of space for research involving subjects in Risk Group 2 and 3,617 square feet for those in Risk Group 3. That size makes it much more convenient for testing vaccines, Quenee said.

"Right now we're limited by space, and we can't have all the studies we want to perform going on at once," she said. "With the Ricketts lab, I won't have that worry."

In addition to the researchers' individual efforts and the building's extensive security protocol, the lab's operations will be inspected frequently by federal, state and local agencies, and trained personnel will monitor the site's 60-plus security cameras 24/7.

With the lab safe from a physical and operational perspective, Joseph Kanabrocki, PhD, assistant dean for biosafety and associate professor of microbiology, said the key to its design was to let research drive how procedures would be conducted inside its concrete walls.

"The most important thing from the scientists' point of view is that they are able to do their science. You need to think about safety from a scientific approach," he said. "You can't just come in and start measuring things."

Before they can set up their dream lab, however, the Ricketts team must secure final approval from a host of regulatory bodies, including the U.S. Centers for Disease Control. It also will go before the university's Institutional Biosafety Committee and the Institutional Animal Care and Use Committee.

Small facilities already exist at Chicago and Argonne, but the space available at Ricketts will enable other institutions in the Great Lakes region to use the site as a testing ground. While the day-to-day operations won't change much from what already occurs on campus, the scale and speed of research will increase, Kanabrocki said.



Clockwise from above: An elevator-sized autoclave at the Ricketts lab is big enough to disinfect large equipment or entire racks of contaminated cages; fingerprint scanners add extra security at lab entrances; and a sophisticated air-handling system controls and filters all airflow into, within and out of the labs. Photos by John Zich