

## Business & Company Resource Center

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### **New Labs for World's Deadliest Germs Often A Hard Sell to Neighbors.**

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By Edie Lau, The Sacramento Bee, Calif. Knight Ridder/Tribune  
Business News

Feb. 10--At the National Institutes of Health in Maryland there is a **laboratory** outfitted to handle the world's deadliest germs. It is not being used.

A similar **laboratory** was constructed in a Toronto suburb several years ago. It, too, is not in use.

Paradoxically, the United States is verging on a building binge of more such **laboratories**, known as Biosafety **Level 4 (BSL 4)** labs. New lab space is planned in Maryland and Montana. And the NIH has invited research centers around the country to compete for grants to build one or two more high-containment infectious disease labs. The deadline for applications is today.

The University of California, Davis, is one of at least four contenders vying for lab funding. UC Davis officials hope to build a \$200 million, 240,000-square-foot lab near the schools of human and veterinary medicine.

The lab would focus on developing diagnostics, treatment and vaccines for top bioweapons agents -- anthrax, plague and the like -- as well as emerging diseases such as West Nile virus and hantavirus.

UC Davis wanted to establish a **BSL 4** lab long before the Sept. 11, 2001, terrorist attacks and subsequent anthrax mailings, citing the rising threat of emerging diseases. But the attacks made building such labs a national priority.

At the same time, existing lab space sits idle.

The inactive labs are not so much a testament that additional **BSL 4** capacity is unnecessary, but a reflection of how difficult it can be to sell "hot labs" to the surrounding communities.

UC Davis is experiencing that difficulty right now. For the past two

weeks, the university has been in defensive mode against a vocal group of opponents, most of them in the city of Davis. The skeptics question how well the university can keep the lab safe and secure, and whether the lab would make Davis a target of terrorists.

Community accord is one criterion by which NIH will judge grant applications. The agency knows something about the matter. Under pressure from local activists, NIH agreed to limit its own lab in Bethesda, Md., to studying domestic pathogens. That means exotic bugs such as Ebola, an African virus whose victims bleed to death, are banned.

The NIH lab last was used in 1998-99 to study multi-drug-resistant tuberculosis, an agency official said. Before that, the lab operated from about 1978 to 1983, then sat unused for 15 years until the TB project. Today, the lab is in "standby mode."

Another limitation of the NIH lab is its size. The facility has about 2,000 square feet of working space, which is one-sixtieth the size of the proposed working space in the UC Davis lab.

"This limits its use to a single agent, and animal-testing capability is limited," said Tom Kindt, director of the Division of Intramural Research for the National Institute of Allergy and Infectious Diseases, the arm of NIH handling **BSL 4** lab planning.

New experiments are being considered for the lab, Kindt added, and it will be used to train personnel for **BSL 4** work elsewhere.

In the Toronto suburb of Etobicoke, the province of Ontario built a \$6 million hot lab, spurred by a suspected local case of Lassa fever, a rare illness similar to Ebola.

The lab never opened.

The Toronto Globe and Mail reported that area residents, fearing for their safety, objected to the lab. At the same time -- this was the mid-1990s -- the Canadian government began planning for a **BSL 4** lab in Winnipeg. Provincial officials ultimately decided the business was better left to the Canadian government, said John Letherby, a spokesman for the Ontario Ministry of Health and Long-Term Care.

The Winnipeg lab opened in 1998, and UC Davis lab advocates now look to it as a model.

Winnipeg's security measures include metal fencing on the perimeter, guards on patrol and bulletproof windows. Entrance to the **BSL 4** lab area, deep within the complex, requires passage through multiple "layers" of security that include locked doors and more guards, said Kelly Keith, a spokeswoman for the Canadian Science Centre for Human and Animal

Health.

From outside, the lab looks like a hospital, Keith said, and is situated near a residential neighborhood.

After the Sept. 11, 2001, jet plane crashes into the World Trade Center and Pentagon, the Canadian government assessed lab security. "It was determined that our security systems were strong and appropriate," Keith said, adding that some minor changes were made, including increasing the guard staff.

As to whether the building could withstand the impact of an airplane crash, Keith said, "Our greatest concern would be loss of life, both of our staff and in the plane. There would be minimal concern regarding the release of infectious agents. We only keep small quantities, and if they were hit, they'd be killed by the fire resulting from the crash."

**BSL 4** labs are complicated buildings. Modern designs typically involve three floors: A lower level for special wastewater treatment; a middle level for research space; and an upper level for an elaborate air-handling system that's supposed to keep within the lab any microorganisms that are airborne.

Lab advocates say such centers are of minimal danger to the outside world.

An NIH fact sheet on **BSL 4 laboratories** states, "There are no recorded incidents involving community contamination from any of the extant **BSL 4** facilities."

In the United States, **BSL 4** labs are located at the U.S. Army Medical Research Institute of Infectious Diseases in Fort Detrick, Md.; the national Centers for Disease Control and Prevention in Atlanta; the NIH in Bethesda; and the Southwest Foundation for Biomedical Research in San Antonio. There also is a small "glovebox" facility -- not a whole building -- at Georgia State University.

Accidents do happen, of course. The Winnipeg lab had two mishaps in 1999 involving the release of wastewater.

Keith said lab liquids -- usually water and disinfectant -- are sterilized twice before entering the public sewage system. In the incidents, the liquids were discharged after a single sterilization.

Authorities concluded there was no danger to the community, and did not report the mishaps to the public. But the media got wind of the incidents, and community furor resulted in large part because the lab hadn't publicized the release.

"The event changed the way we communicate with the public. ... We now strive to be very transparent, and we are aware not only of actual risks but also the perception of risk," she said.

Another potential for risk outside the building is in the transport of pathogens. Researchers commonly use Federal Express and UPS, although germs sometimes are delivered by a courier, "sort of like the diplomatic pouch," said Fred Murphy, a UC Davis virologist who spent 25 years at the CDC. Murphy said he served occasionally as a CDC courier.

He added that new government rules involving biological agents may tighten transportation practices.

People familiar with **BSL 4** labs agree that the greatest risks are to those inside.

In full-size labs such as that proposed for UC Davis, researchers wear protective garb resembling spacesuits. The gear makes wearers clumsy and more quickly fatigued, and safety procedures are laborious.

"You lose a lot of dexterity," said Julia Hilliard, a virologist at Georgia State University who has worked in **BSL 4** labs since 1980, primarily in San Antonio.

"If you forget something (outside the lab), you have to scrub the entire experiment," she said. "... You have to be in a buddy system, always working with somebody. If your cell (cultures) are a little late in growing and it's 8 o'clock at night before they're ready to be infected, that really messes everybody up. You'll be there until midnight or one in the morning."

Researchers cannot eat or relieve themselves in the **Level 4** area. They must undress and completely wash themselves to exit properly.

Under such stressful conditions, things can and do go wrong. "Yes, we've had accidents," said Hilliard. "Needle sticks, we've had gloves tear, we've had instrument malfunctions. We've had ventilatory compromises (with air leaving the lab)."

Hilliard recalled sticking her finger during an autopsy of someone killed by Herpes B, a virus of monkeys transmissible to humans and highly lethal. Echoes of fear still in her voice, Hilliard said she was decontaminated for 15 minutes, then nervously took anti-viral drugs.

Despite the scare, Hilliard still works in **BSL 4** labs. The reason is simple, she said: She loves what she does.

As for the risks, said Hilliard: "You take them with great care."

LAB REVIEW: UC Davis's grant application for a Biosafety **Level 4** infectious diseases **laboratory** will be available for public review beginning today at the following locations:

- Office of the Vice Chancellor for Research, 402 Mrak Hall.
- UC Davis Shields Library reserve desk.
- Carlson Health Sciences Library.
- Yolo County Public Library, 315 E. 14th St., Davis.
- Vacaville Public Library, 1020 Ulatis Drive, Vacaville.

Comments or requests for information should be sent to Vice Chancellor John A. Meyer, Office of Resource Management and Planning, UC Davis, One Shields Ave., Davis, CA 95616. Comments are due by March 13.

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