Inner Workings: The strictest biosafety

Amber Dance

Science Writer

In a small town in the middle of Montana, biologists handle deadly pathogens such as Ebola. Hamilton, with a population of about 4,500, hosts the National Institute of Allergy and Infectious Diseases' Rocky Mountain Laboratories, one of a few dozen facilities

worldwide equipped to deal with disease agents designated the strictest biosafety level 4 (BSL-4).

For virologists such as postdoc Darryl Falzarano, going into the BSL-4 laboratory means stripping before donning scrubs and

a protective space suit. He stops by a retinal scanner and pulls on three pairs of gloves before entering the BSL-4 laboratory. Falzarano studies antivirals against Ebola and the coronavirus that causes Middle East respiratory syndrome.

"You never forget that you're in a BSL-4 lab," says Falzarano. Although he's accustomed to the strictures, the suit is a tad cumbersome. As they move about the laboratory, scientists hook into the air supply via hoses hanging from the ceiling. They can "yell on the phone" when they need to call outside, Falzarano says, and given the multiple gloves, "Most of us are two-finger typists inside." With no custodians, researchers mop the floors themselves. They are limited to five-hour sessions, including at least half an hour to suit up before and decontaminate after their work. On the way out, they shower first in disinfectant, in their suits, and then undress for a regular shower.

Infectious disease specialists have been working in the Hamilton area since around 1900, when researchers arrived to study tick-borne Rocky Mountain spotted fever. Early on, townspeople resisted the studies, and the laboratory conceded with construction of a "tick moat" to keep in infected bugs, although the moat was never filled with water. Today, Falzarano says, most of the citizenry is supportive. However, just the same, when they find out he works in BSL-4, they often make the joke of taking a big step away from him, he says.

Biologist Kyle Rosenke wears a protective suit while working in the BSL-4 laboratory at Rocky Mountain Laboratories in Hamilton, MT. Image courtesy of National Institute of Allergy and Infectious Diseases/Rocky Mountain Laboratories.