

# Henkel Elevates CDC's Biosafety Efforts

By Shannon Omisore, Technical/Writer Editor, CDC



Richard Henkel won the CDC/ATSDR Excellence in Safety: Gerald R. Cooper Laboratory Safety Award.

Richard Henkel, PhD, has been inspecting high containment laboratories throughout the world since 2004. As the biological safety manager for the Division of Select Agents and Toxins (DSAT) in the Office of Public Health Preparedness and Response (OPHPR), he has dedicated his career as a microbiologist to ensuring safety and security in high containment laboratories. Most recently, Henkel was awarded the CDC/ATSDR Excellence in Safety: Gerald R. Cooper Laboratory Safety Award, and has previously received the Secretary of the Department of Health and Human Services (HHS) Awards for Distinguished Service in 2004 and 2006.

Across from Henkel's office desk hangs a "retired" positive pressurized protective laboratory suit previously used while working in biosafety level 4 (BSL4) laboratories. "This highly specialized protective suit prevents the user from being exposed to aerosolized viruses by providing a continuous supply of filtered air into the suit," said Henkel. The suit is a visual reminder of the strenuous work conditions for the Biosafety Team that he leads.



Henkel is the biological safety manager for DSAT. *Photo by Shannon L. Omisore*

Henkel and his team members monitor and inspect laboratories at all of the operating BSL4 laboratories in the United States. These laboratories contain highly pathogenic viruses, such as Ebola, Marburg, smallpox, arenaviruses, and other hemorrhagic fever viruses. Recently, the CDC BSL4 Biosafety team collaborated with law enforcement agencies to investigate the report of a missing vial of hemorrhagic fever from a laboratory near Houston, Texas. After conducting a complete inventory of BSL4 viruses at the facility, it was determined that the inventory discrepancy was due to a mistake in record keeping.

In addition to routinely inspecting BSL4 laboratories, Henkel and his team also investigate laboratories where workplace injuries and accidents have occurred, such as a laboratory scientist being bitten by an animal infected with a biological select agent. "We are the ones who have the regulatory duty to inspect and investigate these accidents. That gives us a duty and a responsibility to take care of these things. We have other CDC experts that we call on all the time. We don't want to get in the way of treatment," said Henkel. "We just want to make sure that the medical treatment is done properly; and at the end, we try to identify the probable cause of the accident and ways to prevent the recurrence of this type of event. We are required to send an annual report to Congress about these incidents."

In 2013, Henkel received the CDC/ATSDR Excellence in Safety: Gerald R. Cooper Laboratory Safety Award in part because of his outstanding contributions as the lead author of "Monitoring Select Agent Theft, Loss and Release Reports in the United States—2004-2010," which was published in the *Applied Biosafety Journal*. He is currently working on a follow-up paper, which will examine potential exposures to large numbers of people in laboratories. "We're excited about this work because it will likely lead to some recommendations on changes in biological practices to minimize the potential for accidental exposure to a select agent in laboratories," said Mark Hemphill, deputy director of DSAT in OPHPR.

Despite the regulations that bind laboratories together, sometimes procedures vary. Henkel is particularly fascinated with observing how other laboratories have different approaches and procedures. "He's probably one of the few people in this country that actually has been inside of probably every operational biosafety level 4 facility in the United States and those that are about to become operational. It really gives him a lot of unique insight on how different facilities are operating and dealing with biosafety issues," said Hemphill.

Henkel has even visited Russia's smallpox laboratory. In 2005, he traveled to Russia as a member of the World Health Organization (WHO) Smallpox Biosafety Inspection Team. The smallpox virus can only be found in two locations—Siberia, Russia, and at CDC in Atlanta. As part of their international agreement, both countries work with WHO to inspect the other country's laboratory containing smallpox. He has also visited BSL4 laboratories in England, France, Canada, and Australia.

As he sits at his desk across from the protective suit, Henkel reminisces about how far laboratories have come over the years: for instance, one of the first high containment laboratories at CDC had wooden floors. As time has passed, the size and complexities of biosafety laboratories increased dramatically. In 1967, the first BSL4 laboratory at CDC was located in a large truck trailer. Flash forward two decades to 1988, when two buildings were built on the Roybal campus—a 6-story building with BSL3 facilities and a 3-story building with BSL4 facilities. This improvement in the design of laboratory facilities has enhanced laboratory safety, but has also made the job of ensuring the safe operation of these laboratories more technically complex.

One fascinating aspect of Henkel's job is staying abreast of technological advances. In an ever-changing field, technology continues to increase and CDC is at the forefront of advancing bio-safety and vaccine development. "You get to see the most incredible technology that's out there," said Henkel. "CDC has such high respect—in both the US and in foreign countries."

Henkel also observes ongoing advances in vaccine development. Advances in technology now allow for vaccines to be developed much faster than in the past. "Nowadays, we get a new flu virus in and some people are able to quickly sequence it. In the old days, it took a while before you could figure out what it was. Now, it can be sequenced in weeks," said Henkel. The importance of developing vaccines to protect people against dangerous viruses matters to Henkel.

"Without the rabies vaccine, nearly every person would die after being bitten by an animal infected with rabies; but if the injured person is given the vaccine properly after the exposure, the overwhelming majority survive," said Henkel. Progress toward making effective vaccines against the most deadly viral agents is an ongoing process. For example, a number of promising vaccine candidates against Ebola virus are being developed and tested in several BSL4 facilities in the United States.

In 2002, Henkel began working for CDC as a BSL4 laboratory safety coordinator before becoming the CDC biological safety officer, Laboratory Operations Section chief, and most recently, the biological safety manager for DSAT in OPHPR. Prior to working at CDC, he worked in the BSL 4 facility at Georgia State University (GSU) in the Herpes Virus B Resource Laboratory with Julia Hilliard, PhD, a renowned scientist and expert in Herpes B virus research. He has also worked in the BSL4 laboratory at the Southwest Foundation for Biomedical Research in San Antonio, TX prior to moving to Atlanta. He earned MS and PhD degrees in biomedical sciences from the University of Texas Graduate School of Biomedical Sciences in Houston.

In his spare time, the proud father of three enjoys attending his younger daughter's swim meets at Georgia Tech, at Florida State University and at the Olympic Trials in 2012. Julia is a senior and the all-time record holder in the 400-meter IM at Florida State University. His older daughter Kelley is married, a graduate of the University of Georgia, and works in healthcare management. Henkel's son Erik is an engineer who is married and lives in metro Atlanta.

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