Specialists from Livermore and Los Alamos national laboratories deployed the Biological Aerosol Sentry and Information System (BASIS) for the 2002 Winter Olympics in Salt Lake City, Utah. BASIS was developed under the sponsorship of NNSA's Chemical and Biological National Security Program.

Defending against Terrorism

The events of September 11, 2001, lent new urgency to the Laboratory's efforts to apply its technologies, tools, and expertise to better prepare the nation to defend against terrorist use of weapons of mass destruction (WMD). The prospect of a devastating bioterrorist attack became even more real a few weeks later when a terrorist sent anthrax through the mail, killing a number of people. Livermore researchers were able to provide immediate help because they had begun addressing the threat of WMD terrorism long before September 11. As part of the National Nuclear Security Administration's Chemical and Biological National Security Program, the Laboratory takes a comprehensive approach to the problem, developing technologies and tools to counter threats and working closely with response agencies to ensure that the technological solutions meet real-world operational needs.

Post–September 11, the Laboratory provided analysis and assessments as well as information tools and expert personnel to the Intelligence Community. Livermore's Nuclear Threat Assessment Center operated seven days a week to evaluate numerous smuggling incidents and nuclear-related threats. In addition, the Counterproliferation Analysis and Planning System (CAPS), developed at Livermore and extensively used by the Department of Defense, supported U.S. military efforts with evaluations focused on sites of concern in and around Afghanistan.

As the anthrax mail cases illustrated, the U.S. is vulnerable to bioattack. Livermore technologies are at the core of the nation's biodefense capabilities. The Laboratory's miniaturized DNA analysis technology has been commercialized by Cepheid Inc. as the Smart Cycler and is being commercialized by Environmental Technologies Group as a handheld instrument. With both instruments, results are available in minutes. They are based on technology breakthroughs in biodetection instrumentation made by Laboratory researchers, who pioneered the miniaturization and ruggedization of DNA identification devices. In 1998, the technology was successfully demonstrated in field tests at Dugway Proving Ground, Utah, and an early version of the handheld instrument was delivered soon after to selected users.

In addition, the Biological Aerosol Sentry and Information System (BASIS), developed jointly by Livermore and Los Alamos, was deployed to Salt Lake City in 2001 as part of the overall security strategy for the 2002 Winter Olympic Games. Smart Cycler biodetectors are the heart of the BASIS field laboratory. Because biodetectors require unique antibodies or DNA sequences to identify and characterize pathogens, Livermore is also developing "gold standard" DNA signatures and assay protocols. They are then validated by the Centers for Disease Control and Prevention (CDC) and distributed by the CDC to the public health community.

The Laboratory is poised to make additional contributions to homeland defense through the development of more advanced technologies to defend against both current and future threats.

Livermore is developing an array of DNA pathogen signatures against which a biological-agent detector matches the samples it gathers. DNA signature development involves a multidisciplinary team of microbiologists, molecular biologists, biochemists, geneticists, and computer experts.