



USAMRMC STRATEGIC INFORMATION PAPER

U.S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASES (USAMRIID)

MISSION

The U.S. Army Medical Research Institute of Infectious Diseases protects the Warfighter from biological threats and is prepared to investigate disease outbreaks or threats to public health.

BACKGROUND

USAMRIID was established in 1969 by the Office of the Surgeon General of the Army to develop medical defenses against biological warfare threats. USAMRIID was originally known as the U.S. Army Medical Unit, Fort Detrick. In 1971, it became part of the U.S. Army Medical Research and Development Command. The Institute has played a key role over the past 40 years as the DoD's lead laboratory for medical aspects of biological defense.

As the only DoD laboratory equipped to safely study highly hazardous viruses that require maximum containment at biosafety level (BSL) 4, USAMRIID is uniquely positioned to develop and maintain biological safety, security, and surety standards to meet multiple levels of regulatory oversight. The Institute also leads the field in developing animal models of aerosol exposure to biological threat agents and in testing vaccines and therapeutics for efficacy in those models. Research conducted at USAMRIID leads to medical solutions—vaccines, drugs, diagnostics, and information—that benefit both military personnel and civilians.

The primary research focus of USAMRIID since its inception has been on highly virulent diseases. USAMRIID scientists focus on the identification and initial development of medical countermeasures to protect military personnel against biological attack. These products include candidate vaccines and drugs, diagnostic capabilities, and medical management

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procedures to minimize the effects of disease, preserve fighting strength, and maximize return to duty after exposure. Because there are many natural disease threats that could affect deployment of forces into endemic areas, medical countermeasures for those diseases are studied as well.

As the Center of Excellence for DoD medical biological defense research, USAMRIID's main challenge is to maintain its world-class scientific and technology base while being responsive to its primary customer—the Warfighter.

QUESTIONS & ANSWERS

Q *What are the most common biological threat agents?*

A The most common biological threat agents are those that cause anthrax, botulism, plague, smallpox, ricin intoxication, and nerve damage.

Q *How does USAMRIID define “biosafety level”?*

A BSL refers to the level of biocontainment precautions that are needed to isolate dangerous biological agents in an enclosed facility. In the United States, the Centers for Disease Control and Prevention (CDC) has specified containment levels ranging from 1 (lowest BSL) to 4 (highest BSL). BSL-4 is required when working with agents that can result in severe to fatal disease in humans for which vaccines or other treatment options are unavailable or with dangerous and exotic agents that pose a high individual risk of aerosol-transmitted laboratory infections.

Q *What are the key features of USAMRIID's BSL-4 facilities?*

A USAMRIID's BSL-4 laboratories are designed with built-in waste decontamination systems. Integrated laboratory sterilization systems process all liquid and solid wastes completely, and high-efficiency filtration removes any airborne material, making all solid, liquid, and air effluents sterile and safe before they leave the facility.

A combination of structural integrity, engineering controls, meticulous procedures, and tight security accounts for the outstanding safety record of BSL-4 facilities throughout the 40 years they have been in existence. In addition, researchers who work in such laboratories are highly trained and follow rigorous safety procedures.

KEY THEMES AND MESSAGES

The vision of USAMRIID is “right product, right time, to the Warfighter.” The Institute strives to be the nation’s preeminent research laboratory, providing cutting-edge medical research for the Warfighter against biological threats.

While USAMRIID’s primary mission is to protect the Warfighter, its research has applications that benefit society as a whole, as demonstrated by many Cooperative Research and Development Agreements and other partnerships established with industry, academia, and other government agencies.

The Institute’s five core competencies are biological agent research; rapid identification of biological agents; testing and evaluation of medical countermeasures; training and educating the force; and maintaining safety, security, and surety standards.



Q *How does USAMRIID ensure the safety of its workers and the surrounding community?*

A The first priority is maintaining a safe and secure environment for our workforce and the surrounding community. USAMRIID's comprehensive safety program emphasizes safety training, risk management, environmental surveillance, and occupational health screening. The physical security program uses layered security measures to allow only authorized individuals access to the areas in which BSAT are stored or used. These individuals must satisfactorily complete laboratory safety training, physical examination screening and a security background investigation. The personnel reliability program (PRP) requires that all individuals who have completed the requirements for BSAT access also undergo a personnel records review, a medical evaluation, and an interview with the Certifying Official highlighting individual responsibilities, reliability standards, and reporting requirements. Agent accountability involves inventory control, shipping, transfer and destruction records, and observation of laboratory procedures. USAMRIID has led the nation in development and implementation of its biosurety program, setting the benchmark for other laboratories engaged in the national biodefense effort.

Q *Why are infectious diseases a concern to our military?*

A Infectious diseases continue to impact operational forces to the point where service members are more often hospitalized for infectious diseases than for being wounded in combat. Infectious diseases also place a significant burden on the medical logistical system for people requiring treatment or hospital space. The loss of personnel to infectious diseases reduces operational readiness and effectiveness by requiring replacement troops.

Q *What are some of the key contributions of USAMRIID?*

A USAMRIID has made significant advances in the areas of vaccine development, drug development, diagnostics, and training and education.

- **Vaccines:** USAMRIID-developed vaccine candidates for anthrax, ricin toxin, and hantaviruses are currently in clinical testing. Other vaccine candidates for plague, botulinum neurotoxins A and B, and Venezuelan equine encephalitis are in advanced development. Vaccines for staphylococcal enterotoxins A and B and five additional serotypes of botulinum neurotoxins (designated C-G) will soon be transitioned.

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- **Drugs:** USAMRIID is working to develop therapeutics for a number of agents, including Ebola virus, plague, several toxins, and orthopoxviruses (e.g., smallpox, which is studied by USAMRIID investigators at the CDC—the only official repository of the smallpox virus in the United States).
- **Diagnostics:** USAMRIID is developing multiple assays for the Joint Biological Agent Identification System, an integrated diagnostics platform for biological threat agents. The Institute also serves as one of only three National Laboratories in the CDC’s Laboratory Response Network, or LRN.
- **Training and Education:** USAMRIID conducts the Medical Management of Biological Casualties Course, which has trained thousands of military and civilian health care providers in recognizing and treating the signs of biological agent exposure. (The course is offered in partnership with the U.S. Army Medical Research Institute of Chemical Defense, which covers similar material geared toward chemical agent exposure.) USAMRIID also offers the Field Identification of Biological Warfare Agents course, which trains laboratory personnel who conduct diagnostic testing in a field setting.

Q *How does USAMRIID define a “biological threat agent?”*

A A variety of agents can be used in a biological attack. Some agents cause infectious diseases that can spread in populations (e.g., smallpox) while other agents are only dangerous when an individual comes into direct contact with them (e.g., anthrax).

Q *What is “bioterrorism,” and how does it differ from other types of attacks?*

A “Bioterrorism” is defined as the intentional use of germs or harmful biological substances (i.e., biological threat agents) to cause widespread fear and illness. Acts of bioterrorism often are not recognized immediately since they do not typically involve an explosion or other obvious signs. Therefore, it may take health care workers some time to determine that a disease is spreading through a population in a particular area. Nuclear, chemical, and radiation attacks differ from bioterrorist attacks in that they are designed to release dangerous substances into the air and the surrounding environment and result in immediate damage.

Q *What are some of USAMRIID’s accomplishments in the global war on terror?*

A USAMRIID’s expertise in the laboratory identification and medical management of biological threat agents was instrumental in the wake of the September 11 terrorist attacks and the anthrax mailings that followed. Between September 2001 and May 2002, USAMRIID received and evaluated more than 30,000 samples and performed more than 260,000 separate assays to determine the presence of biological threat agents. This effort, which was dubbed Operation Noble Eagle, required USAMRIID to expand its capacity for threat agent identification by nearly 10-fold virtually overnight. USAMRIID also provided a three-person team to perform on-site sample collection at the American Media Building in Florida (the site of the first anthrax letter) and advised federal and state officials on how



to decontaminate the building. In addition, animal research conducted at USAMRIID led to the highly publicized strategy for antibiotic treatment of anthrax patients with ciprofloxacin (brand name Cipro).

USAMRIID continues to lead the national effort to test the efficacy of preclinical and U.S. Food and Drug Administration (FDA)-licensed antibiotics against a wide range of bacterial biothreat agents. Over the course of the past 5 years, more than 500 antibiotics and research compounds have been evaluated using bacterial cell culture and animal models of infection. The information derived from these studies directly supports the FDA licensure of antibiotics for use against select agent infections and will support the development of clinical treatment algorithms for prophylaxis and treatment of Warfighter infections. These studies also permit rapid downselection of potential therapeutic compounds early in the developmental stage, thus providing essential time and cost savings to U.S. Government and pharmaceutical partners.

USAMRIID's newest course offering, Biological Agent Identification and Counterterrorism Training (BAIT), provides realistic training scenarios, facilities, and subject matter experts to increase the ability of first responders to handle a biological threat event. Training can be custom designed based on the organizations involved and projected threats. BAIT training has involved National Guard Civil Support Teams; local, state, and federal law enforcement and HAZMAT teams; and federal criminal investigation agencies.

Q *Is USAMRIID's research program classified?*

A No. USAMRIID research is widely published in the open scientific literature. USAMRIID scientists are encouraged to publish in peer-reviewed journals and to present their findings at national and international scientific meetings.