



U.S. ARMY MEDICAL RESEARCH AND MATERIEL COMMAND

USAMRMC

National Interagency Biodefense Campus

Mission

The mission of the National Interagency Biodefense Campus (NIBC) is to co-locate facilities for multiple federal agencies that are engaged in biodefense research to encourage collaboration and reduce costs through shared infrastructure.

Background and Environment

The NIBC was organized through congressional action tasking multiple federal agencies with biodefense research. The purpose of the NIBC is to provide the nation with a biocontainment laboratory space for biological threat characterization and bioforensic research. NIBC facilities are being constructed at Fort Detrick, Maryland. The NIBC will include laboratory facilities belonging to the Department of Defense (DoD), the Department of Homeland Security (DHS), and the National Institute of Allergy and Infectious Diseases (NIAID) of the National Institutes of Health. Additional agencies involved with the NIBC will be the U.S. Department of Agriculture (USDA) and the Centers for Disease Control and Prevention (CDC). The roles that each of the participating agencies will play in the campus are as follows:

- DHS – Basic and translational research to understand biological threats and attribute their use will occur at the National Biodefense Analysis and Countermeasures Center (NBACC).
- DoD – Research and development of medical products to protect the military from biowarfare threats will occur at the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID).
- NIAID – Advanced imaging and diagnostic studies of disease protection will occur at the Integrated Research Facility (IRF).
- USDA – Research on pathogen detection and identification for crop protection will occur at the Agricultural Research Service (ARS), Foreign Disease-Weed Science Research Unit (FDWSRU).
- CDC – Advanced environmental microbiology research to protect public health will be conducted.

Collectively, these laboratories have complementary scientific goals to support national biodefense objectives and will collaborate on developing a comprehensive understanding of biological agent characteristics (NBACC), elucidating the disease process (NIAID's IRF), and developing products to reduce risks to human health and agricultural productivity (USAMRIID and USDA's ARS).

Of note, NBACC will house two centers, the Biological Threat Characterization Center (BTCC) and the National Bioforensic Analysis Center (NBFAC). The BTCC will seek to define the characteristics of biothreat agents and conduct rigorous biodefense risk assessments to guide national biodefense research, development, and acquisition efforts, and to provide scientific

support to the intelligence community. The NBFAC will be the lead federal facility for conducting and facilitating the technical forensic analysis and interpretation of materials recovered following a biological attack to support the appropriate lead federal agency.

Key Themes and Messages

The NIBC is designed to bring together the nation's biodefense research experts onto a single campus to conduct research on biological threats and bioforensics in a collaborative, shared environment.

The NIBC contributes to the implementation of Homeland Security Presidential Directives on biodefense.

Questions and Answers

Q1. How do you define a “biological threat agent,” and what are some examples?

A1. 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., ricin). The most common biological threat agents are ricin and those that cause anthrax, botulism, plague, smallpox, and nerve damage.

Q2. Why is biological security of particular concern at the current time?

A2. Although threats from biological sources are not novel, technological developments and increased mobility have resulted in new forms of threat and vulnerability. Several biological attacks over the past decade have led to an increased amount of attention on the potential human and national security implications of threats from biological sources. These events include the 2001 mailings of anthrax spores to various government officials and media organizations and the 2004 mailings of ricin to government officials. As deadly as they now are, biothreat agents employed in biological attacks could become even more sophisticated. Advances in biological research and biotechnology present the prospect of newly developed toxins or live agents that will require new detection methods and preventive measures, including vaccines and therapies.

Q3. What characteristics may contribute to the likelihood of an agent being used in a biological attack?

A3. Characteristics that have been identified as contributory to the use of a particular agent in a biological attack include:

- Ease of acquisition;
- Transmissibility;
- Mode of spread (e.g., person to person);
- Case fatality rate;
- Ease of dissemination;
- Frequency of serious sequelae (e.g., blindness) in survivors; and
- Availability and efficacy of countermeasures (e.g., vaccines) and therapeutic measures.

(These data were derived from Casadevall and Pirofski, 2004, *Trends in Microbiology*, 12(6):259–263.)

Q4. What safety measures are taken by scientists to ensure their safety and the safety of the local community?

A4. DoD laboratories employ the highest safety standards recommended for the research proposed to be conducted within them. Physical safeguards are established and used, including protective-handling equipment, laboratory suits, airflow and filtration controls, and decontamination equipment. Standards known as “biosafety levels” (BSLs) have been developed to prevent scientists and the environment from being exposed to microorganisms. 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 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.

Q5. What are the distinctions between biological threat characterization and bioforensic analysis?

A5. *Biological threat characterization* consists of laboratory-based assessments of biological threats and vulnerabilities that affect the level of threat awareness. More specifically, laboratory experiments/studies are conducted to fill in information gaps to better understand current and future biological threats, assess vulnerabilities, conduct risk assessments, and determine potential impacts to guide the development of countermeasures such as detectors, drugs, vaccines, and decontamination technologies to protect the United States against these threats. *Bioforensic analysis* is conducted on materials recovered from a bio-crime or terrorist attack to attain a “biological fingerprint” to identify perpetrators and determine the origin and method of attack. Bioforensic research employs a variety of technologies to develop, evaluate, and validate the tools needed to characterize specific information about an agent that will help to determine whether it was released intentionally or appears naturally in the environment.

Q6. What types of research are being conducted by the different agencies in the NIBC?

A6. The agencies collaborating in the NIBC are conducting research as detailed follows:

- DHS, through NBACC, is providing knowledge of infectious properties of biological agents, effectiveness of countermeasures, decontamination procedures, and bioforensic analyses to support policy makers’ and responders’ development of policies, programs, and technologies.
- DoD, through USAMRIID, is conducting research and development of medical products (e.g., vaccines and drugs) that protect the military from biowarfare threats.
- NIAID, through the IRF, is performing advanced imaging and diagnostic studies of disease protection.
- USDA, through the ARS and FDWSRU, is developing techniques for the rapid detection and identification of new and emerging crop pathogens.
- CDC is performing advanced environmental microbiology research aimed at protecting public health.

Q7. Where can I find out more information about the NIBC?

A7. Additional information on the NIBC can be accessed on the Internet at <http://www.detrick.army.mil/nibc/nibc01.cfm>.