

BACKGROUND

The Department of Homeland Security (DHS) Science and Technology Directorate's (S&T) National Biodefense Analysis and Countermeasures Center (NBACC) is the first national laboratory created by DHS. Established in 2004, the lab operates in partnership with the Federal Bureau of Investigation (FBI) and is located at the National Interagency Biodefense Campus at Fort Detrick, Maryland. NBACC provides a one-of-a-kind biocontainment laboratory capability to address biological threats. NBACC's components include the National Bioforensic Analysis Center (NBFAC) and the National Biological Threat Characterization Center (NBTCC). NBACC's operating model is unique among S&T labs as a Federally Funded Research and Development Center operated by Battelle National Biodefense Institute (BNBI).

MISSION

Provide the scientific basis for the characterization of biological threats and bioforensic analysis to support attribution of their planned or actual use.

NBACC requires dedicated resources to maintain modern capabilities and strategic investment in its infrastructure to support the dynamic DHS and FBI missions. Its facilities are national security assets to DHS components, law enforcement, and first responders.

EXPERTISE

NBACC's infrastructure and subject matter experts provide the broader Homeland Security Enterprise (HSE):

- The only purpose-built maximum biocontainment laboratory to serve the DHS biodefense mission
- A national resource for 24/7 biodefense and bioforensic support to federal law enforcement
- Over 50,000 square feet of lab space (BSL-2, 3, 4)
- One of only 13 BSL-4 labs in the United States
- Work for Others (WFO) program that makes NBACC national security capabilities available to federal agencies
- Unique expertise and capabilities in aerobiology
- Regulatory compliance with Defense Security Service and Centers for Disease Control and Prevention and the U.S.

Department of Agriculture Biological Select Agent and Toxin Program and other Quality Systems.



NBACC's WFO Program allows interagency partners throughout the HSE to utilize NBACC's one-of-a-kind biological characterization and bioforensic capabilities.

IMPACT

Since its inception, NBACC has played a key role in America's response to the Nation's most difficult public health and biodefense challenges. Its staff work in partnership with operational end-users to provide the scientific basis and operational capability necessary to detect events quickly and respond effectively.



BIOLOGICAL THREAT CHARACTERIZATION

NBTCC operates at the direction of DHS S&T and conducts experiments to better understand biological vulnerabilities and hazards. This work informs biological agent hazard modeling

required for effective preparedness and response planning for DHS, Health and Human Services, Department of Defense, and the intelligence community. From fiscal year (FY) 2011 through FY 2022, NBTCC transitioned products that address >100 traditional agent knowledge gaps, providing timely and high-quality data on the characteristics of biological threat agents and dual-use technologies.

AGENT PERSISTENCE & DECONTAMINATION RESEARCH

NBTCC conducts research to help scientists and decision-makers better understand the stability of dangerous pathogens. Its unique expertise and capabilities in aerobiology played a crucial role in the federal government's 2014 response to the Ebola outbreak and more recently, the COVID-19 pandemic. NBTCC scientists greatly improved the understanding of SARS-CoV-2 (the virus causing COVID-19) and effective methods to prevent its spread. Their real-time, impactful data products informed not only DHS component operational response to COVID-19, but also national and international pandemic response and policy decisions.



NBTCC conducted studies on the environmental persistence of SARS-CoV-2, comparing early isolates of the virus to newer variants of concern. Outcomes included formulas to predict how long the virus persists in aerosols and on surfaces; data to support development of methods for high temperature sanitization of vehicles; disinfection efficacy data that identified effective products; and animal models of COVID-19 that determined how much virus must be inhaled to infect an animal. Collectively, these knowledge products increase scientific understanding of the virus's behavior under real-world conditions and informed strategies to mitigate its spread.

BIOFORENSIC ANALYSIS

NBFAC operates at the direction of the FBI's Laboratory Division and conducts 24/7 technical analyses for sensitive federal law enforcement investigations. Experts identify

biological components in evidentiary samples with simultaneous analyses that incorporate agent-specific assays in bacteriology, virology, toxinology, immunology, molecular biology as well as methods-based capabilities, including genomics, microscopy, mass spectrometry and bioinformatics.

TECHNICAL CAPABILITIES AID INVESTIGATIONS OF BIOCRIME AND BIOTERRORISM

NBFAC provides the FBI with bioforensic testing and analysis on samples for suspected biothreats, using leading techniques, tools, and laboratory infrastructure. NBFAC has built strong technical core capabilities with ISO 17025 accredited methods which are used in federal investigations and prosecutions.

SARS-COV-2 NATURAL DECAY CALCULATORS

In 2020, S&T released online predictive modeling tools to estimate natural decay of SARS-CoV-2 under a range of environmental factors that impact its stability in the air or on surfaces. Leveraging the results of research conducted by NBTCC, the tools assist operators in the field by estimating environmental persistence of the virus under certain combinations of temperatures and humidity. To interact with these free resources, visit <https://www.dhs.gov/science-and-technology/sars-calculator>.