Pacific Northwest
NATIONAL LABORATORY
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Evaluation of Hand-Portable Biological Detection Technologies

PROJECT OVERVIEW

The Department of Homeland Security (DHS), Science and Technology (S&T) Directorate administers programs to develop, field test, and transition to commercialization next-generation technologies that are necessary to effectively counter potential attacks on the Nation. The Chemical and Biological Division of S&T supports this mission by identifying and developing technologies for the DHS operational components that are needed to reduce the probability and potential consequences of a biological or chemical attack on the Nation's civilian population, its infrastructure, or its agricultural system.

As part of the effort to field test next-generation biodetection technologies, the Pacific Northwest National Laboratory (PNNL) is under contract with the DHS to determine First Responder biodetection needs when responding to biological events and to assess currently available biodetection technologies used when responding to potential bioevents involving suspicious powders.

Photo Credit: CPT Bryon Marsh (CST, GA)

BENEFIT TO THE NATION: FIRST RESPONDERS

The key goal of this effort is to provide an understanding of the capabilities and limitations of hand portable biological detection platforms in order to improve the biological response capabilities of the first responder community.

PLATFORMS CURRENTLY UNDER EVALUATION USING DNA, SPORES, TOXIN, AND COMMONLY ENCOUNTERED HOAX POWDERS

General Biological Indicator Technologies

Protein Screening Tests

- INDIPRO (Macherey-Nagel)
- BioCheck® Powder Screening Kit (20/20 Bioresponse)
- BioScreener™ (Field Forensics)

DNA Screening Test

- Prime Alert® (GenPrime®)

Adenosine Triphosphate Test (ATP) Screening Tests

- Profile® 1 (New Horizons Diagnostics)
- Clean-Trace™ Surface ATP (3M)

Fourier Transform Infrared Spectroscopy (FTIR) Screening Test

- HazMatID™ 360 (Smiths Detection)

Biothreat Detection Technologies

Immunoassays/Optical Readers

- 1-agent BADD® assays (AdVnt)
- 5-agent ProStrips™ (AdVnt)
- 5-agent RAID™ 5 (Alexeter)
- 8-agent RAID™ 8 (Alexeter)
- 1-agent BioDetect™ Test Strips and Guardian™ Reader (Alexeter)
- 3-agent and 4-agent NIDS® assays and SAR IV Optical Reader (ANP Technologies®)
- 8-agent IMASS assay (BBI Detection)
- 1-agent ENVI assays and Bioassay Optical Reader Module (Environics)
- 3-agent Toxin Screen (GenPrime®)
- 1-agent SMART™ II assays (New Horizons)
- 1-agent CANARY® assays and Zephyr Identification Systems (Path Sensors)
- 1-agent RAMP® Test Strips and Optical Reader (Response Biomedical)
- BioThreat Alert® Test Strips and Optical Reader (Tetracore)

Polymerase Chain Reaction (PCR) Platforms

- Bio-Seeq™ PLUS (Smiths Detection)
- FilmArray® (BioFire Diagnostics)
- POCKIT (GeneReach USA)
- RAZOR® EX (BioFire Diagnostics)
- T-COR 4™ (Tetracore)

TRANSITION TO FIRST RESPONDERS: INDEPENDENT TESTING AND FIELD TRAINING OF HAND-PORTABLE BIODETECTION EQUIPMENT

Following laboratory evaluation, PNNL will provide the equipment to first responder groups in the Pacific Northwest for use in field training exercises to evaluate the "human factors" associated with the real-world application of the technologies.

ABOUT PNNL

The Pacific Northwest National Laboratory, located in southeastern Washington State, is a U.S. Department of Energy Office of Science laboratory that solves complex problems in energy, national security, and the environment, and advances scientific frontiers in the chemical, biological, materials, environmental, and computational sciences. The Laboratory employs nearly 4,300 staff members, has an annual budget in excess of $950 million dollars, and has been managed by Ohio-based Battelle since 1965.

Please visit our project website for further information:
http://biodetectionresource.pnnl.gov

This effort is funded by the Department of Homeland Security Science and Technology Directorate under Contract HSHQDC-08-X-00843.

Homeland Security
Science and Technology

For more information, please contact:

Cindy Bruckner-Lea
cindy.bruckner-lea@pnnl.gov
(509) 375-4460

Rachel Bartholomew
rachel.bartholomew@pnnl.gov
(509) 371-6906

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