

3RD ANNUAL **OAK RIDGE NATIONAL LABORATORY**
BIOSURVEILLANCE SYMPOSIUM

Identification & Integration of Essential Information for the
National Strategy for Biosurveillance

JUNE 12 • BALTIMORE, MD



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Program Overview

The National Strategy for Biosurveillance (Strategy) calls for “a coordinated approach that brings together Federal, state, local, and tribal governments; the private sector; nongovernmental organizations; and international partners” to enhance existing biosurveillance capabilities and, where necessary, develop new ones that provide decision makers and responders with the essential information they need to mitigate impacts of threats to health and associated economic, societal, and political consequences. The Strategy recognizes that a well-integrated national biosurveillance enterprise can save lives by providing essential information for better decision making at all levels.

The National Biosurveillance (BSV) Science and Technology (S&T) Roadmap, published in June 2013, identifies and prioritizes the R&D efforts needed to provide decision makers at all levels with the accurate and timely information needed to develop effective responses to incidents that threaten health. The R&D objectives in this Roadmap are designed to facilitate the accomplishment of the core functions and actions identified in the Strategy and Implementation Plan, respectively. Consistent with the Strategy and Homeland Security Presidential Directive (HSPD)-21 entitled Public Health and Medical Preparedness, this Roadmap focuses on S&T for anticipating significant health incidents involving naturally occurring, accidental, or manmade threats; rapidly and accurately identifying and characterizing incidents that occur; and effectively integrating, sharing, and analyzing the information available at each stage. Achieving the S&T objectives in this Roadmap will permit better decision making during an incident, resulting in improved mitigation, response, and recovery that may ultimately save lives and improve health.

This symposium will address The National Strategy for Biosurveillance identified core functions which include:

Aberration detection – Define and prioritize R&D needed to establish the baseline condition of the environment and/or human (including vulnerable subpopulations), animal, or plant populations that is sufficiently robust to permit rapid identification of aberrant incidents to drive preparedness and timely, focused investigation.

Risk anticipation – Define and prioritize R&D needed to identify antecedent conditions and characterize complex interactions that permit prediction of an impending natural or intentional incident and to forecast impacts from such incidents.

Threat identification and characterization – Define and prioritize R&D needed to ensure exposures and health threats are identified rapidly and accurately and can be sufficiently characterized to provide needed information to decision makers, including responders and healthcare providers.

Information integration, analysis, and sharing – Define and prioritize R&D needed to enable improved integration, sharing, and analysis of BSV data in near real-time and in a format that provides essential information to decision makers, including responders and healthcare providers.

Research priorities identified in the roadmap:

Establish baseline levels of community and ecosystem risks, threats, and health:

- Assess baseline exposures to endemic, occupational, and environmental threats
- Expand spatial and temporal mapping of endemic and epidemic disease
- Determine levels of immune (natural and vaccine-derived) protection for various populations

Enhance methods and tools to rapidly detect aberrations from the baseline:

- Develop statistical or mathematical algorithms to quickly and reliably distinguish a valid threat signal from background conditions
- Improve language processing and parsing tools
- Differentiate (temporal scale) between changes of immediate concern (e.g., influenza, foot-and-mouth disease) and those that have a large scale effect but spread more slowly (e.g., sudden oak death, fungal infections in bats and bees)

- Assess state-of-the-art in aberration detection methods and tools applied in other sectors (e.g., intelligence, financial markets, credit industry) and evaluate how they might be leveraged or applied to BSV applications
- Improve qualitative characterization of aberrations through targeted education and training of the next generation of BSV professionals

Sustain R&D efforts aimed at improving understanding of determinants of disease emergence and reemergence, including ecological and evolutionary factors that promote the ability of organisms to move to new host-species (e.g., swine/avian influenza to humans) and acquire antimicrobial resistance

Focus on R&D relating to forecasting technologies and models that consider ecological and evolutionary drivers of disease behavior

Connect non-invasive data-gathering tools to other types of surveillance data to improve the ability to detect antecedent conditions and the earliest indications of a significant incident

Development of rapid, reliable detection and diagnostic capabilities:

- Increase the speed and performance of threat detection, exposure, and disease diagnosis to support rapid and effective treatment decisions, contain disease, and mitigate the impact of a potential outbreak
- Move the determination of individual (asymptomatic) exposure and diagnosis of disease closer to the point of care (POC)/point of need (PON) setting, resulting in rapid initiation of treatment
- Enhance global access to POC/PON tests

Development of instrumentation and large-data-set processing capabilities to rapidly identify characteristics of known agents, rapidly detect changes in known agents, and/or to discover the existence of unknown agents from samples in clinical or environmental matrices

Development/enhancement of systems that improve near real-time sharing of electronic health, diagnostic, and other anomalous health event data

Development of improved mechanisms to assess data/information sources for relevancy to BSV

Development of multilateral communication mechanisms among various levels of government and the private sector (including healthcare providers, international partners, and others) to enable timely decision making at all levels

Development of a national, interagency BSV data-sharing framework that integrates data/information from disparate sources to enable early warning and early detection of incidents and situational awareness during an incident

Integration of all source data (intelligence, law enforcement, environmental, socio-economic, and health information) to enhance the detection of a disease event and facilitate warning and forecasting of impact

Formalization of a means to effectively communicate uncertainty in BSV data used for decision making

TUESDAY, JUNE 10, 2014 7:00-9:00pm

**Dinner Short Course:
Application of Next-Generation Sequencing and Bioinformatics to Human Identification, Microbial Detection and Biosurveillance***

Instructors:

Rita Colwell, Ph.D., Distinguished Professor, University of Maryland

Seth Faith, Ph.D., Principal Research Scientist, Battelle

Brian Young, Ph.D., Technology Initiatives Leader, Battelle

Topics To Be Covered:

- NGS-based approaches to biodetection and biosurveillance
- NGS sample preparation and sequencing workflows for forensic genomics
- Bioinformatic approaches to NGS-based allelotyping in human identification

** Separate registration required for short courses*

Conveniently Timed and Co-Located With



Attend All 3 Days

Symposium Agenda

THURSDAY, JUNE 12, 2014

8:00am Registration with Morning Coffee

8:45 Chairperson's Welcome and Opening Remarks

John Doesburg, International Security & Analysis Programs, Oak Ridge National Laboratory (ORNL)

9:00 White House Office of Science & Technology Policy for Biological & Chemical Threats

Andrew M. Hebbeler, Ph.D., Assistant Director for Biological and Chemical Threats, Office of Science and Technology Policy, Executive Office of the President of the United States

9:30 Biosurveillance Portal: Situational Awareness for the Department of Defense

C. Nicole Rosenzweig, Ph.D., Research Biologist, Edgewood Chemical Biological Center, U.S. Army RDECOM Laboratory

The Joint Program Executive Office (JPEO) is the Joint Services manager for acquisition and fielding information management systems for the Warfighter. Currently, JPEO is executing an Advanced Technology Demonstration (ATD) which includes an informatics effort: the Biosurveillance Portal. To support the situational awareness needs of the Warfighter, development of a common informatics architecture is the first order of business. To this end, the Operational Release of the Biosurveillance Portal is October, 2014. With this defined software stack, the portal will support seamless communication and data sharing in the US Pacific Command. The user base will be expanded to other US Commands in FY15, with functionality expansion planned for each release.

10:00 National Biosurveillance Integration Center Enabling Shared Situational Awareness of Acute Biological Events Through Rapid Identification, Characterization, Localization and Tracking

Steve Bennett, Ph.D. Director, National Biosurveillance Integration Center, Office of Health of Affairs, U.S. Department of Homeland Security

10:30 Coffee with Exhibit & Poster Viewing

11:00 U.S. Government Perspective on Medical Preparedness for the National Strategy for Biosurveillance

Susan Collier Monarez, Ph.D., Director, Medical Preparedness Policy, National Security Council Staff, Executive Office of the President of the United States

11:30 Common Platforms for Diagnostic and Environmental Assays Provide Comprehensive Situational Awareness for Diverse Missions

Amy L. Altman, Ph.D., Vice President, Biodefense, Luminex Corporation

Ensuring the safety of our food supply is critical as unsafe food accounts for millions of deaths and cases of disease annually. Our ability to quickly detect and characterize an outbreak of a food borne illness, whether due to a bioterrorist event or inadvertent food contamination, is critical for saving lives and minimizing the economic impact of such an incident. Foodborne illness is a growing public health problem and sensitive and accurate detection of the causative agent presents unique instrumentation and assay challenges. Determining the source of the outbreak also presents challenges as the first sign of a potential

food borne outbreak is typically a surge of patients seeking medical care for gastrointestinal symptoms. To provide more comprehensive situational awareness, efforts at Luminex include developing both a more comprehensive assay menu and a suite of instruments to address varying mission needs from high-throughput laboratories to field assessment. Open-architecture xMAP® technology allows simultaneous detection of bacterial, viral and toxin agents, in a highly flexible, multiplexed architecture capable of protein and nucleic acid assay formats. We will discuss how diagnostics and environmental detection assays can work synergistically to provide timely and accurate answers.

12:00pm Q&A and Concluding Discussion for the Morning Session

John Doesburg, International Security & Analysis Programs, Oak Ridge National Laboratory (ORNL)

12:15 Luncheon Presentation (Sponsorship Opportunity) or Lunch on Your Own

2:00 DTRA's Biosurveillance Ecosystem

Ronald K. Hann Jr., Ph.D., Director, CB Technologies, Defense Threat Reduction Agency/Joint Science and Technology Office (DTRA/JSTO)

2:30 Integrative Biosurveillance

Harshini Mukundan, Ph.D., Principal Investigator, Chemistry Division, Los Alamos National Laboratory

Biosurveillance requires the integration of complex data from variant sources. Herein we present some of the critical technological tools that can advance that ultimate mission: from advanced diagnostics for pathogen characterization to modeling algorithms. Specifically, we will outline the advancements made and lessons learned in applying these tools to a real world population in rural Kenya. This work is a collaboration between the Los Alamos National Laboratory and the University of New Mexico (center for global health).

3:00 Development of a JUPITR/GBTI Exemplar Training Laboratory for Evaluation and Optimization of Capability: A New Approach

David L Hirschberg, Assistant Professor of Clinical Pathology & CTO, Columbia University

A Joint USFK Portal and Integrated Threat Reduction (JUPITR) Advanced Technology Demonstration (ATD) and Global Biosurveillance Technology Initiative (GBTI) Exemplar laboratory located at Edgewood Chemical Biological Center (ECBC) will serve as a resource for many stakeholders and fulfill several programmatic roles. A testbed for component, reagent, and bioinformatics upgrades, the lab will optimize capabilities in biosurveillance technologies and function as a operation training laboratory for the US Army Public Health Command. The laboratory will also serve as a technology demonstration site for US Army Test and Evaluation Command assessment of JUPITR ATD capabilities ahead of operational demonstration by US Forces Korea (USFK) in 2015.

3:30 PANEL DISCUSSION: R&D Objectives of The National Strategy for Biosurveillance

Moderator: John Doesburg, International Security & Analysis Programs, Oak Ridge National Laboratory (ORNL)

4:30 End of Symposium

Sponsorship & Exhibit Opportunities

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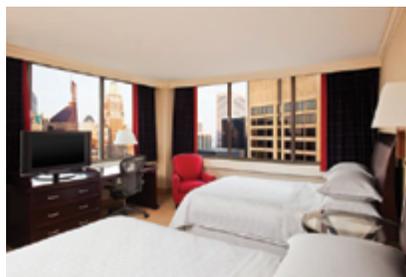
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Registration fee includes access to the Conference, refreshments, access to posters and exhibit, and all documentation made available to us by speakers.

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Poster Submissions: Poster abstracts are due by May 10, 2014. Once your registration has been process and payment has been received we will email you a confirmation of the acceptance of your poster. The Knowledge Foundation reserves the right to publish your poster title and abstract in the marketing materials related to this conference.

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