Rapid Detection for Food Safety

ADVANCES IN GENOMICS, CAPTURE TECHNOLOGIES & HIGH THROUGHPUT DETECTION

COVERAGE INCLUDES:

- Light scattering and spectral pattern recognition for bacterial detection
- Raman and FTIR spectroscopy for high throughput detection of pathogens and toxins
- Flow cytometry for rapid detection of pathogens in complex matrices
- Antimicrobial peptides as bioaffinity ligands for pathogen detection
- High affinity capture and detection of foodborne pathogens using phage tail proteins arrayed onto solid phase supports

KEYNOTE SPEAKERS:

Food Safety Microbiology in the Metagenomics Era
John Besser, Ph.D., Deputy Chief of the Enteric Diseases, Centers for Disease Control & Prevention

Understanding Lower Limits of Detection
Bob Buchanan, Ph.D., Professor & Director, Center for Food Safety & Security Systems, University of Maryland

Dinner Workshop 1: Rapid Sample Preparation for Pathogen Detection
Instructor: Dave Alburty, CEO, InnovaPrep LLC
Rapid Sample Preparation for Pathogen Detection

This workshop will discuss sample preparation technologies for detection, identification and analysis of biomedical, biological and chemical agents, biothreats in point-of-care, laboratory and field settings. It will review the novel and rapid technologies for sample preparation, application of analytical strategies and automation in biodetection.

Topics to be Covered Will Include:

- Sampling and Analysis Strategies
- Sample Prep Advantages
- Some Lessons learned the Hard Way
- Successful Case Study – Environmental
- Automation for Biodetection
- Have a Clear Goal and a Plan
- Choose your Gear with the End in Mind

Instructor:

Dave Alburty, Chief Executive Officer, InnovaPrep, LLC

Mr. Alburty has over twenty years experience in the Aerosol Research Industry. Beginning at Midwest Research Institute (MRI) in Kansas City his work as a staff research scientist centered on aerosol studies in environmental and biodefense applications. After serving fifteen years at MRI, Dave founded an aerosol science and engineering R&D test and evaluation/product development lab in Drexel Missouri. AlburtyLab offers third party validation to developers of many large-scale Homeland Security and Department of Defense projects as well as various commercial products.

Through his work in the biodefense industry, Dave recognized a missing technology between bio-collection and rapid biodetection/identification. That link is the advancement of sample preparation and biological concentration technologies. Through internal research and development projects at AlburtyLab, The InnovaPrep System was developed to fulfill that need. InnovaPrep LLC was subsequently launched in June 2009 as a manufacturer and integrator of biological sampling and concentration systems and solutions.

* Separate registration required for workshop

SPONSORSHIP & EXHIBIT OPPORTUNITIES

Cambridge Healthtech offers comprehensive packages that can be customized to your budget and objectives. Sponsorship allows you to achieve your goals before, during, and long after the event. Packages may include presentations, exhibit space and branding, as well as the use of delegate lists. Signing on early will maximize your exposure to qualified decision-makers and drive traffic to your website in the coming months.

Podium Presentations — Available within Main Agenda!

Showcase your solutions to a guaranteed, targeted audience through a 15- or 30-minute presentation during a specific conference program, breakfast, lunch, or separate from the main agenda within a pre-conference workshop. Package includes exhibit space, on-site branding, and access to cooperative marketing efforts by Knowledge Foundation. For the luncheon option, lunches are delivered to attendees who are already seated in the main session room. Presentations will sell out quickly, so sign on early to secure your talk!

Invitation-Only VIP Dinner/Hospitality Suite

Select specific delegates from the pre-registration list to attend a private function at an upscale restaurant or a reception at the hotel. From extending the invitations, to venue suggestions, Knowledge Foundation will deliver your prospects and help you make the most of this invaluable opportunity.

One-on-One Meetings

Select your top prospects from the pre-conference registration list. We will reach out to your prospects and arrange the meeting for you. A minimum number of meetings will be guaranteed, depending on your marketing objectives and needs. A very limited number of these packages will be sold.

Exhibit

Exhibitors will enjoy facilitated networking opportunities with qualified delegates, making it the perfect platform to launch a new product, collect feedback, and generate new leads. Exhibit space sells out quickly, so reserve yours today!

Additional branding and promotional opportunities are available, including:

- Conference Tote Bags
- Literature Distribution (Tote Bag Insert or Chair Drop)
- Badge Lanyards
- Program Guide Advertisement
- Padfolios and More...

For more information, please contact:

Sherry Johnson
Business Development Manager
781-972-1359 | sjohnson@healthtech.com
AGRO-DEFENSE, TOXINS & ALLERGENS

1:55 pm Chairperson’s Opening Remarks
Willy Valdivia-Granda, Ph.D., CEO, Orion Integrated Biosciences

2:00 Agro-Defense - A Holistic, All of Enterprise Approach
Tammy R. Beckham, D.V.M., Ph.D., Dean, Professor, College of Veterinary Medicine, Kansas State University

The ability to protect our agricultural industries, food supply, and public health sectors from natural introductions of biological agents, agro-terror threats, and emerging and re-emerging diseases is heavily dependent on an organized, strategic, and well-funded approach. This approach should institutionalize the “One Health” concept, be highly collaborative in nature, leverage all available resources and encompass an international, global health component. The One Health concept must be understood, adopted and become part of the fabric of the way in which we approach biodefense.

2:30 xMAP® Multiplex Detection: Getting Beyond Detection to Include Built-In Confirmation, Characterization, and the Ability to Distinguish between Unanticipated Homologous Analytes
Eric Garber, Ph.D., Division of Bioanalytical Chemistry, Office of Regulatory Science, Center for Food Safety and Applied Nutrition, FDA

By using antibody-based multiplex methods (e.g., xMAP®), it is possible to generate antigenic profiles along with other second-order forms of data processing. These results can provide built-in confirmation, recognition, and characterization of unique features, as well as the detection of novel unexpected analytes. Such approaches have been applied to the detection of toxins and recently a commercial assay was developed for the detection of food allergens to meet the complexity of a growing global marketplace and an increase in the apparent prevalence of food allergies.
E. coli detect, identify, and characterize. Whole genome sequencing (WGS) is providing a
Developments in omic- and genetic-based technologies are enhancing the ability to
Research Service, Eastern Regional Research Center, USDA
Pina M. Fratamico, Ph.D., Research Microbiologist, Research Leader, Agricultural
The Department of Comparative Pathobiology, Purdue University
Arun Bhunia, Ph.D., Professor of Food Microbiology, Department of Food Science,
Control Laboratory, Iowa State University
Byron Brehm-Stecher, Ph.D., Associate Professor, Rapid Microbial Detection and
OPTICAL & GENETIC APPROACHES FOR DETECTION &
CHARACTERIZATION OF PATHOGENS
10:45 Rapid Detection of Enterobacteriaceae as Indicator for Pathogen Testing Using a Light Scattering Sensor
Arun Bhunia, Ph.D., Professor of Food Microbiology, Department of Food Science, Department of Comparative Pathobiology, Purdue University
The Enterobacteriaceae (EB) family and its most known members, coliforms, are used as "indicators" of hygiene monitoring, sanitation practices and process verification of food products. Colony scatter images were analyzed using image classifier and results show BARDOT can potentially be used for differentiation and identification of members of EB family and the coliforms for use in food process verification, hygiene monitoring, or food safety. (Contributing authors: Marcela Martinez and Atul K. Singh)
11:15 Genetic-Based Methods for Characterization, Detection, and Typing of E. coli
Pina M. Fratamico, Ph.D., Research Microbiologist, Research Leader, Agricultural Research Service, Eastern Regional Research Center, USDA
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detect, identify, and characterize E. coli. Whole genome sequencing (WGS) is providing a
powerful and expanding range of information to identify targets for the development of
rapid and specific detection and identification systems for E. coli and other bacteria and is being implemented for source tracking and as part of routine surveillance systems. It is expected that further developments in WGS and other genomic and molecular technologies will continue to contribute to the development of improved detection and identification systems and to a greater understanding of the pathogenesis of E. coli and ultimately provide better resources for improving public health.
11:45 Sponsored Presentation (Opportunity Available)
12:15 pm Lunch on Your Own
TUESDAY, JUNE 27
8:00 am Morning Coffee
8:55 Chairperson's Opening Remarks
Byron Brehm-Stecher, Ph.D., Associate Professor, Rapid Microbial Detection and Control Laboratory, Iowa State University
9:00 KEYNOTE PRESENTATION: Food Safety Microbiology in the Metagenomics Era
John Besser, Ph.D., Deputy Chief of the Enteric Diseases, Centers for Disease Control & Prevention
Metagenomics, once the sole realm of research labs, will soon become practical for many food safety activities. Together, these advancements will change how we monitor foods and food production environments, detect and investigate outbreaks, and will fundamentally change our understanding of foodborne disease. Current sequencing-based activities for CDC's food safety programs will be described, along with a discussion of exciting possible applications in the not-too-distant future.
9:30 FEATURED PRESENTATION: Understanding Lower Limits of Detection: Promising You Can Detect a Single Bacterial Cell in Food Samples Is One You Cannot Deliver
Bob Buchanan, Ph.D., Professor & Director, Center for Food Safety & Security Systems, University of Maryland
10:00 Coffee Break in the Exhibit Hall with Poster Viewing
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RAPID DETECTION FOR FOOD SAFETY (CONT.)
2:55 Bacteriophage Engineering for the Onsite Detection of Pathogens and Indicators

Emma Farquharson, Ph.D. Student, Nugen Lab, Cornell University

Bacteriophages continue to offer new tools for advancing food safety. By modifying phages to be amenable for deployable, low-cost, and rapid assays - this opens the door for significant improvements to be made to current portable methods. This allows phage-based assays to be used in resource-limited areas such as those encountered in food and agriculture.

3:15 Nucleic Acid Biosensors for the Detection of Pathogens

Lingwen Zeng, Ph.D., Researcher, Institute of Environmental and Food Safety, Wuhan Academy of Agricultural Science and Technology, China

Pathogens are recognized as widespread and toxic contaminants that can cause deleterious effects on food safety and human health. In our lab, we focus on developing nucleic acid biosensors for pathogens detection using aptamers as the molecular recognition elements. Employing colorimetric analysis, lateral flow strip biosensor, and fluorescence detector as the sensing platforms, our proposed biosensors would be promising strategies for pathogens detection which offer prominent advantages of improved sensitivity and convenience.

3:45 Refreshment Break in the Exhibit Hall with Poster Viewing

4:15 Label-Free Protein Detection Based on the Heat-Transfer Method – A Case Study with the Peanut Allergen Ara h1 and Aptamer-Based Synthetic Receptors

Marloes Peeters, Ph.D., Assistant Professor, Chemistry & Environmental Science, Manchester Metropolitan University, United Kingdom

Aptamers are an emerging class of molecules which, due to the development of the systematic evolution of ligands by exponential enrichment (SELEX) process, can recognize virtually every target ranging from ions, to proteins, and even whole cells. We will present the heat-transfer method (HTM) as an interesting alternative since this offers detection in a fast and low-cost manner and has the possibility of performing experiments with a fully integrated device. This concept has been demonstrated for a variety of applications including DNA mutation analysis and screening of cancer cells, but the concept of using this for food safety (allergen) detection is novel.

4:45 New Advanced Colorimetric Assay Performed during the Enrichment Process for the Detection of Foodborne Pathogens

Bruce Applegate, Ph.D., Professor, Center for Food Safety Engineering, Purdue University

Methodology for the detection of foodborne pathogens requires an enrichment step which is the time sink in most protocols. A colorimetric method which exploits this step for detection has been developed for *E. coli* O157:H7. The method also allows for the selective recovery of the pathogen if present and can be developed for other organisms as well.

5:15 End of Rapid Detection for Food Safety Track and Workshop Registration

5:30 Workshop 1: Rapid Sample Preparation for Pathogen Detection*

*Instructor: Dave Alburty, CEO, InnovaPrep LLC

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**HOTEL AND TRAVEL INFORMATION**

**CONFERENCE VENUE AND HOTEL:**

Westin Alexandria
400 Courthouse Square
Alexandria, VA 22314
Tel: 703-253-8600

Discounted Room Rate: $219 s/d
Discounted Room Rate Cut-off Date: June 5, 2017

You may call the hotel directly to reserve your sleeping accommodations. You will need to identify yourself as a Cambridge Healthtech Institute conference attendee to receive the discounted room rate with the host hotel. Reservations made after the cut-off date or after the group room block has been filled (whichever comes first) will be accepted on a space- and rate-availability basis. Rooms are limited, so please book early.