NIST-Hosted Workshop on Collaborative Efforts to Enable Adoption of Rapid Microbial Testing Methods for Advanced Therapy Products

Date: Tuesday 25-April-2023
Time: 9:00am-5:00pm (ET)
Location: IBBR (Rockville, MD)/Virtual
Hosted By: NIST

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NIST Rapid Microbial Testing Methods Consortium

Bringing together experts across the regenerative medicine field, including stakeholders in industry, academia, and the government, the NIST Rapid Microbial Testing Methods (RMTM) Consortium seeks to address the need for measurement standards for rapid microbial testing of regenerative medicine and advanced therapy products.

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WELCOME AND OVERVIEW

With great pleasure, we welcome you to the 2023 NIST Rapid Microbial Testing Methods Consortium Workshop. Traditional methods for assessing contamination in pharmaceutical products take weeks, but emerging advanced therapy products require more rapid results. Rapid microbial testing methods (RMTMs) are available but have not been widely adopted, due in part to the need for manufacturers to independently validate rapid microbial methods as well as the lack of tools to support this validation. In 2020, NIST established the RMTM Consortium to convene stakeholders in the pre-competitive space and develop measurement solutions and standards that increase confidence in the use of RMTMs. Outside of NIST, other organizations are similarly focusing on tools and solutions to support the use of rapid microbial methods for sterility and adventitious agent testing. This workshop will bring together organizations including the NIST RMTM Consortium, the Standards Coordinating Body (SCB), the United States Pharmacopeia (USP), the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL), and others - to share their current and future activities. Together, we will discuss how to support one another, leverage and align activities, and identify opportunities for collaboration to accelerate the adoption of RMTMs in the advanced therapy community and beyond. This one-day, hybrid workshop is open to all.

Workshop Goal

Identify opportunities for leveraging and coordinating ongoing and future efforts on rapid microbial testing methods (RMTMs) to accelerate the validation and adoption of RMTMs in advanced therapy products.

Expected Outcomes Include

- An established line of communication among professional organizations supporting the use of rapid microbial methods
- Identification of common themes, unique roles, areas of overlap, and gaps in activities to support RMTM adoption
- Follow-up meetings to discuss potential collaborations and how to leverage activities
- Workshop report

AGENDA

OPENING	
9:00 AM – 9:25 AM	Welcome and Opening Remarks *Scott Jackson, PhD, Leader, Complex Microbial Systems Group, Biosystems and Biomaterials Division (BBD), Material Measurement Laboratory (MML) at the National Institute of Standards and Technology (NIST)* *Stephanie Hooker, PhD, Acting Director, MML at NIST*
9:25 AM – 10:00 AM	KEYNOTE PRESENTATION A Pathway for Implementing Rapid Microbial Test Method *Veera Dheenadhayalan, PhD, Director of Biosafety at AstraZeneca*

SESSION 1: Efforts that Support Rapid Microbial Testing Methods for Advanced Therapies *Moderator: Kirsten Parratt, BBD, MML, NIST*	
10:00 AM – 10:15 AM	USP Evolving Position on Use of Rapid Microbial Methods *Huiping Tu, PhD, Senior Principal Scientist at USP*
10:15 AM – 10:30 AM	PDA Activities Related to Rapid Microbial Methods *Fred Ayers, Advisor – Global Quality Systems at Eli Lilly and Company*
10:30 AM – 10:45 AM	Accelerating Adoption of Rapid Microbial Detection Technologies *Jennifer Mantle, PhD, Regulatory Committee Coordinator/Technical Project Manager at the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL)*
10:45 AM – 11:00 AM	**BREAK**
11:00 AM – 11:15 AM	Advanced Virus Detection Technologies Interest Group (AVDTIG) - Advancing the Adoption of NGS for Adventitious Agent Detection *Siemon Ng, PhD, Senior Director of Analytical Development and Quality at Notch Therapeutics*
11:15 AM – 11:30 AM	An Overview of the Modern Microbial Methods Collaboration *Allison Scott, PhD, Principal Scientist at MicronView LLC*
11:30 AM – 11:45 AM	NIST Rapid Microbial Testing Methods (RMTM) Consortium: Activities and Directions *Nancy Lin, PhD, Leader, Biomaterials Group, BBD, MML at NIST*
11:45 AM – 12:00 PM	Current State of Standards for RMTMs in Advanced Therapies *Dawn Henke, PhD, Senior Technical Program Manager, Standards Coordinating Body for Regenerative Medicine (SCB)*

LUNCH (on your own)
12:00 PM – 1:30 PM

SESSION 2: Feedback and Discussion on Rapid Microbial Testing Methods *Moderator: Nadratun Chowdhury, BBD, MML, NIST*	
1:30 PM – 1:45 PM	Introduction to Breakout Sessions *Nadratun Chowdhury, PhD, National Research Council Postdoctoral Fellow, BBD, MML at NIST*
1:45 PM – 2:55 PM	Breakout Sessions

2:55 PM – 3:25 PM	Breakout Session Report-out and Discussion *Breakout Session Moderators, NIST*
3:25 PM – 3:45 PM	**BREAK**
3:45 PM – 4:45 PM	Panel Discussion *Moderator: Scott Jackson, NIST* *Panelists:* • *Guo-Chiuan Hung, PhD, Chemistry, Manufacturing, and Control (CMC) Reviewer at FDA/CBER/Office of Advanced Therapies (OTAT)/Division of Cellular and Gene Therapies (DCGT)/Gene Therapy Branch* • *Michael Miller, PhD, President at Microbiology Consultants, LLC* • *Jennifer Robbins, Senior Principal Scientist in Cell Therapy Development at Bristol Myers Squibb* • *Tricia Vail, Regional Segment Marketing Manager – Applied Research Markets at Sartorius Corporation*

CLOSING	
4:45 PM – 5:00 PM	Concluding Remarks *Scott Jackson, NIST*

SLIDES ONLY (No presentation)
Activities of the MIT Center for Biomedical Innovation Related to Rapid Microbial Methods *Stacy Springs, PhD, Executive Director, MIT Center for Biomedical Innovation*

SPEAKER/PANELIST BIOGRAPHIES

KEYNOTE SPEAKER

Veera Dheenadhayalan, PhD, Director of Biosafety at AstraZeneca

1994, Graduated in Biology and received PhD in Immunology from India.

Joined Cornell University in 2000 for Post-Doctoral research focusing on DNA vaccines. Later joined CBER, FDA as a visiting fellow to continue the post-doc studies on novel PE/PPG gene family of M. tuberculosis, candidate vaccine development and also developing a safety evaluation model for tuberculosis.

In 2005, joined as a scientist at Aeras (non-profit organization advancing the development of tuberculosis vaccines), performing immunogenicity studies, vaccine efficacy assessment and clinical end-point assays for various candidate vaccines programs.

In 2015, joined IDT Biologika (CDMO focusing viral vaccines and gene therapeutics) as Director Quality Control & Assay Development, supporting various viral vectors, recombinant proteins and bacterial vaccine's specific assay developments, qualifications and lot release activities.

In 2020, joined AstraZeneca as Director, Biosafety and bioassay development. In the current role, providing scientific and strategic leadership for the biosafety testing of biologics including viral vaccines, monoclonal antibodies and cell therapy products. Also, working on introducing nucleic acid technologies for biosafety testing for sterility, mycoplasma and adventitious agent testing for biologics.

INVITED SPEAKERS

Stephanie Hooker, PhD, Acting Director, Material Measurement Laboratory at NIST

Dr. Stephanie A. Hooker is the Acting Director of the Material Measurement Laboratory (MML) at the National Institute of Standards and Technology (NIST). She holds a Ph.D. in Ceramic Engineering from Clemson University, with a minor in Analytical Chemistry. She began her career at NASA developing detector technology for atmospheric sensing, leading the development of a spaceflight experiment that demonstrated first-of-its-kind superconducting electronics and cryocooler technology in space. From 1998-2002, she served as Business Development Manager for Nanomaterials Research, LLC, a startup company developing both nanoparticle technology and nanostructured devices. During that time, she secured venture capital investments, large partnerships with Fortune 500 companies, and exclusive licensing to spin out two new businesses in the nanotech space. Since joining NIST in 2002, she has served as Group Leader, Division Chief, Program Director, Associate Director (MML), Acting Deputy Director (MML), and, most recently Acting Director (MML). She has led programs in nanotechnology, impact-resistant materials for head health, and plastics recycling, as well as being a founding member of NIST's diversity and inclusivity strategy development.

Huiping Tu, PhD, Senior Principal Scientist at USP

Dr. Tu has been working with USP for over 10 years. Currently she is the senior Principal Scientist to manage the Microbiology Expert Committee and leads the effort to develop the microbiology related USP general chapters. Her previous role in USP was the Director of the Biologics Laboratory, and she managed the bioanalytical, bioassay and microbiology teams. She oversaw daily operation of the laboratory and interactions with other USP departments, the global biological units and stakeholders to promote good quality of biotherapeutic products globally.

Prior to joining USP in 2012, she worked most recently at Merck, where she was a Senior Research Scientist at Cardiovascular Diseases Franchise to work in early drug discovery process ranging from target identification/validation, lead compound identification /optimization and safety assessment.

Dr. Huiping Tu received her M.S. in Organic Chemistry and Ph. D. in Physiology. Dr. Tu has a broad scientific background in the fields of cardiovascular and neurological diseases with deep and broad expertise in microbiology, molecular/cell biology, biochemistry, and analytical chemistry. She has more than 20 years' experience in pharmaceutical industry, academia, and regulatory science with in-depth knowledge of USP-NF and the development of reference standards relevant to pharmaceutical products. Dr. Tu is the leading author or co-author of many prestigious peer-reviewed publications including Cell; J. Clinical Investigation and Neuron and holds several patents.

Fred Ayers, Advisor – Global Quality Systems at Eli Lilly and Company

Jennifer Mantle, PhD, Regulatory Committee Coordinator/Technical Project Manager at the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL)

Jennifer Mantle received her BS in Chemical Engineering from Villanova University and her PhD in Chemical and Biomolecular Engineering from the University of Delaware. She has been working for the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL) since 2017. In her tenure at NIIMBL, she has managed the Regulatory Considerations Committee, served as a project manager for over 20 multi-organization technical and workforce development projects, and is currently the lead scientist for the NIIMBL Next Generation Sequencing Test Bed, which is being built to support the community around adventitious agent testing and product characterization for new modalities.

Siemon Ng, PhD, Senior Director of Analytical Development and Quality at Notch Therapeutics

Dr. Siemon Ng is the Senior Director, Analytical Development and Quality at Notch Therapeutics and is responsible for developing and implementing the analytical strategy for Notch's iPSC-derived immunotherapies. Dr. Ng has extensive experience with analytical development including next generation sequencing and NGS data analysis, digital PCR, qPCR, and other molecular and immunological techniques. Dr. Ng is an active member of the PDA Advanced Virus Detection Technologies Interest Group and has participated in multiple collaborative studies involving the use of NGS. Prior to joining Notch Therapeutics in 2022, Dr. Ng was the Head of the Molecular Biology Centre at Sanofi Pasteur, Analytical Sciences for vaccine development. Dr. Ng completed his PhD at Simon Fraser University studying the Atlantic salmon genome. Subsequently, he worked on mouse genomics at The Jackson

Laboratory. In 2008, Dr. Ng moved to Toronto to study the genomic landscape of stem cells at the Ontario Institute for Cancer Research.

Stacy Springs, PhD, Executive Director, MIT Center for Biomedical Innovation

Dr. Stacy Springs is the Executive Director at the MIT Center for Biomedical Innovation (CBI). The Center integrates the Institute's technical, scientific, and management expertise to solve complex biopharmaceutical challenges. CBI leads multi-stakeholder, multidisciplinary research and educational initiatives with real world impact, including MIT's Biomanufacturing Consortium, (BioMAN), and its Consortium on Adventitious Agent Contamination in Biomanufacturing, (CAACB). Dr. Springs is a principal investigator on several research programs in biologics manufacturing, from application of data analytics and PAT in the continuous production of monoclonal antibodies, viral vectors and vaccines; to development of innovative rapid sterility tests and new approaches to adventitious agent contamination through long read sequencing. Dr. Springs is part of SMART CAMP, where she is focused on and serves as the Chair of Landmark Bio's Science and Technology Committee. Dr. Springs' research interests include biopharmaceutical development and manufacturing, risk management, regulatory and translational science and food safety and food supply chains. She holds a PhD in Chemistry from the University of Texas at Austin and gained postdoctoral training in protein and biophysical chemistry at Princeton University.

Allison Scott, PhD, Principal Scientist at MicronView LLC

Allison Scott is a member of the Modern Microbial Methods Collaboration Steering Committee and a facilitator for one of its three sub-teams. She has worked on evaluating modern methods, their diverse applications in air and water monitoring, and in supporting their implementation in the pharmaceutical and related industries for over thirteen years. Allison is also a principal scientist at MicronView LLC where she specializes in particle and microbial monitoring solutions. She holds a joint Doctorate Degree in Materials Science and Engineering from the University of Arizona and in Materials Chemistry from the University of Rennes.

Nancy Lin, PhD, Leader, Biomaterials Group, Biosystems and Biomaterials Division at NIST

Dr. Nancy Lin is the Leader of the Biomaterials Group in the Biosystems and Biomaterials Division, Material Measurement Laboratory at the National Institute of Standards and Technology. Her research focuses on developing measurements and standards to enable detection, characterization, and quantification of microbes and microbial communities, with an emphasis on microbial cell reference materials, biofilm-material interactions, antimicrobial efficacy, microbiome, and biosurveillance. Nancy holds a BS in Mechanical Engineering from Valparaiso University and a PhD in Biomedical Engineering from Case Western Reserve University.

Dawn Henke, PhD, Senior Technical Program Manager, Standards Coordinating Body for Regenerative Medicine (SCB)

Currently Dawn works to oversee all of the Standards coordinating body's technical effort in standards develop and education for advanced therapies. Dawn holds a PhD in Genetics and Genomic Sciences from University of Alabama at Birmingham.

Prior to joining SCB, she worked as a post-doctoral fellow at the National Institutes of Health in the National Eye Institute performing stem cell research developing retinal organoids for testing and therapeutic purposes from stem cells.

INVITED PANELISTS

Guo-Chiuan Hung, PhD, Chemistry, Manufacturing, and Control (CMC) Reviewer at FDA/CBER/Office of Advanced Therapies (OTAT)/Division of Cellular and Gene Therapies (DCGT)/Gene Therapy Branch

Dr. Hung earned his PhD from the University of Melbourne, Australia, where his research focused on developing diagnostic molecular assays for equine parasitic infections. In 2009, he joined CBER, FDA as a Staff Fellow in the laboratory of human tissue microbiology where his responsibilities were to establish the basic capability of clinical microbiology culture systems for the detection and characterization of microbes with safety concerns in human tissue grafts and to develop rapid detection molecular technology for pathogens of main safety concerns in tissues intended for transplantation. Additionally, Dr. Hung played a key lead role in the development of high-throughput next generation sequencing (NGS) capabilities and bioinformatic pipelines for the detection and characterization of previously unknown microorganisms. He received CBER Honor awarded in 2011 and FDA Honor Award in 2020 for his outstanding scientific achievements. In 2021, Dr. Hung joined the Gene Therapy Branch in the Division of Cellular and Gene Therapies (DCGT), Office of Advanced Therapies (OTAT), CBER as a full-time chemistry, manufacturing and control (CMC) reviewer.

Michael Miller, PhD, President at Microbiology Consultants, LLC

Dr. Michael J. Miller is an internationally recognized microbiologist and subject matter expert in pharmaceutical microbiology, contamination control and the validation and implementation of rapid microbiological methods (RMM). He is currently the President of Microbiology Consultants, LLC (http://microbiologyconsultants.com), and owner of http://rapidmicromethods.com, an educational website dedicated to the advancement of rapid microbiological methods within a variety of healthcare, pharmaceutical, consumer and related industry sectors.

For more than 30 years, he has held numerous R&D, manufacturing, quality, business development and executive leadership roles at Johnson & Johnson, Eli Lilly and Company and Bausch & Lomb. In his current role, Dr. Miller consults with multinational companies in providing technical, quality, regulatory and training solutions in support of rapid methods, sterile and non-sterile pharmaceutical manufacturing, contamination control and remediation, environmental monitoring, sterilization and laboratory operations.

Dr. Miller has authored more than 100 technical publications and presentations and is the editor of PDA's Encyclopedia of Rapid Microbiological Methods. He currently serves on the editorial and scientific review boards for American Pharmaceutical Review, European Pharmaceutical Review and the PDA Journal of Science and Technology. Dr, Miller serves as the chairperson for the revision.

Jennifer Robbins, Senior Principal Scientist in Cell Therapy Development at Bristol Myers Squibb

Jennifer Robbins leads the Molecular Analytics team in Cell Therapy Development at Bristol Myers Squibb. The team is primarily responsible for development and GMP validation of novel qPCR and ddPCR methods for characterization and release of CAR T cell therapy products. The team has a focus on safety methods and supports both clinical and commercial programs. Prior to joining BMS, Jennifer most recently worked at Novartis on development and validation of molecular release assays for Kymriah, the first commercially approved CAR T cell therapy. Jennifer holds a BS in Microbiology from Michigan State University.

Tricia Vail, Regional Segment Marketing Manager – Applied Research Markets at Sartorius Corporation

With over 20 years' experience with microbiology and filtration, Tricia Vail has extensive experience in multiple markets including foods & beverages, water, air, cannabis, cosmetics, and pharmaceuticals. She is an active member of ASTM, ANSI, AOAC & ISO and represent the United States on a multitude of regulatory committees focusing on test methods for microbiology. She is also a member of the American Society of Brewing Chemists (ASBC) and the Brewers Association (BA). She has a passion for microbiology and is dedicated to helping the any industry achieve their quality needs.

ACKNOWLEDGEMENTS

We would like to express our gratitude to all speakers and panelists for their contributions to this event. We also thank the Nicole Tenly and the team at the Institute for Bioscience and Biotechnology Research (IBBR) for technical support and the NIST microbial team for note-taking and breakout session support.

PLANNING COMMITTEE

NIST

Nadratun Chowdhury, Ph.D.
Complex Microbial Systems Group

Tara Eskandari, M.S., B.S.
Biosystems and Biomaterials Division-HQ

Scott Jackson, PhD
Complex Microbial Systems Group

Shaswat Koirala, M.S., B.S.
Biosystems and Biomaterials Division-HQ

Jason Kralj, PhD
Complex Microbial Systems

Nancy Lin, PhD
Group Leader, Biomaterials Group

Stephanie Servetas, PhD
Complex Microbial Systems Group

Standards Coordinating Body for Regenerative Medicine (SCB)

Dawn Henke, PhD
Senior Technical Program Manager

Melody Sanders, PhD
Scientific Program Manager

ADDITIONAL INFORMATION

Overview of the NIST-Led RMTM Consortium

The NIST Rapid Microbial Testing Methods (RMTM) Consortium addresses the need for measurements and standards, including reference materials, to increase confidence in the use of rapid testing for microbial contaminants in regenerative medicine and advanced therapy products. The Consortium is organized into three working groups (WGs).

WG01 MISSION: The Reference Material Working Group (WG01) aims to identify and facilitate the development, characterization, and qualification of reference materials (RMs) to support the broad adoption of new and existing Rapid Microbiology Test Methods (RMTMs) within the Advanced Therapy Industry.

WG02 MISSION: The Methods and Validation Schemes Working Group (WG02) aims to develop a framework for validating methods to support the broad adoption of new and existing Rapid Microbiology Test Methods (RMTMs) by the Advanced Therapy Industry.

WG03 MISSION: The Interlaboratory Study Design and Implementation Working Group (WG03) aims to design and implement interlaboratory studies to assess the analytical performance of various RMTMs while also evaluating the performance and fitness of candidate reference materials.

HOW TO GET INVOLVED

Become A Member

- Complete the Letter of Interest Form
- Participants will sign a Cooperative Research and Development Agreement (CRADA); Federal Agencies may join under a Letter of Agreement
- No cost to join the Consortium

Member Benefits

- Access to a neutral forum to address pre-competitive needs
- Participation in the development of reference materials, methods, and protocols, and interlaboratory studies
- Access to tools developed by the Consortium ahead of public release
- Institutional representation in Consortium directions

For more information, please contact Nancy Lin (nancy.lin@nist.gov) and Scott Jackson (scott.jackson@nist.gov)