Immerse Yourself in Cutting-Edge Science at ASM Microbe 2024

ASM Microbe 2024 showcases the best microbial sciences in the world and provides a one-of-a-kind forum to explore everything from new microbial discoveries to the latest techniques in clinical practice and public health. From pandemic prevention and disaster microbiology to powering the future, microbes underpin life on this planet and beyond. As one of the largest microbiology gatherings in the world, ASM Microbe’s nearly 200 sessions deliver a jam-packed schedule of events, showcasing microbes, the people dedicated to studying them and the groundbreaking research and innovation coming out of the field today.

This schedule-at-a-glance is your guide to the conference, providing a comprehensive look at the diverse range of sessions, workshops, and presentations scheduled throughout the event. With 8 scientific tracks to explore, each with dedicated track hubs, you can plan your conference experience and be among the first to learn about the latest discoveries and breakthroughs in the microbial sciences. Use this schedule to identify sessions and topics that align with your interests and needs and create a personalized journey that maximizes your learning and networking opportunities. Whether you’re interested in attending talks on pandemic prevention, exploring the role of microbes in powering the future or discovering the latest research and techniques in clinical practice, this program book has everything you need to make the most of your ASM Microbe 2024 experience.
Session Types

Cross-Track Plenary
This type of session focuses on interdisciplinary topics of broad interest and showcases transcendent science. Cross-Track Plenary provide an opportunity to expand scientific knowledge and better understand new trends in the field of microbiology. The format is 2-hours in length and invited speakers, followed by a panel discussion or Q&A segment.

In-Depth Symposium Information
This type of session addresses an important issue and/or research on a particular subject, with a diversity of knowledge and/ or points of view presented by leading experts. The format is 2-hours in length and includes invited speakers and 3 or 4 oral abstracts.

Panel Discussion
This type of session generates spontaneous interaction among panelists and between panelists and the audience in response to questions posed by the session convener.

Track Hub
This type of session features a short, highly interactive presentation on a track-specific topic held in informal, open-space Track Hubs on the Exhibit and Poster Hall floor.

Mini-Conference
This session type is an extended format focusing on a specific topic area in the microbial sciences. Mini-Conferences will be scheduled on Thursday, June 13 and Monday, June 17.
# Schedule-at-a-Glance

## THURSDAY, JUNE 13

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>8:00 a.m.</td>
<td>Full Day Courses/Workshops $</td>
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<tr>
<td>10:00 a.m.</td>
<td>Industry &amp; Science Workshops</td>
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<tr>
<td>12:00 p.m.</td>
<td>City Bus Tour $</td>
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<tr>
<td>12:30 p.m.</td>
<td>Half-Day Courses/Workshops</td>
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<tr>
<td>1:30 p.m.</td>
<td>Mini-Conferences</td>
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<tr>
<td>3:00 p.m.</td>
<td>Attendee Orientation</td>
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<tr>
<td>4:30 p.m.</td>
<td>Opening General Session</td>
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<tr>
<td>6:30 p.m.</td>
<td>Opening Reception</td>
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## FRIDAY, JUNE 14

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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:15 a.m.</td>
<td>Cross-Track Plenary</td>
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<tr>
<td>8:15 a.m.</td>
<td>In-Depth Symposia</td>
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<tr>
<td>9:15 a.m.</td>
<td>Panel Session</td>
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<tr>
<td>10:00 a.m.</td>
<td>Exhibit &amp; Poster Hall Open</td>
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<tr>
<td>10:30 a.m.</td>
<td>Poster Presentations</td>
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<tr>
<td>10:45 a.m.</td>
<td>Track Hub Session &amp; Career Talks</td>
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<tr>
<td>11:00 a.m.</td>
<td>Industry &amp; Science Spotlights</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>Track Hubs: Rapid Fire Presentations</td>
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<tr>
<td>11:00 a.m.</td>
<td>Track Hubs: Rapid Fire Presentations</td>
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<tr>
<td>12:00 p.m.</td>
<td>Track Hubs: Rapid Fire Presentations</td>
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<tr>
<td>12:45 p.m.</td>
<td>Industry &amp; Science Spotlights</td>
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<tr>
<td>1:00 p.m.</td>
<td>Industry &amp; Science Spotlights</td>
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<tr>
<td>12:45 p.m.</td>
<td>Track Hub Session &amp; Career Talks</td>
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<tr>
<td>1:45 p.m.</td>
<td>Panel Session</td>
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<tr>
<td>1:45 p.m.</td>
<td>In-Depth Symposia</td>
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<tr>
<td>2:00 p.m.</td>
<td>Lounge &amp; Learn: Late Breaking Presentations</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>Panel Session</td>
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<tr>
<td>4:00 p.m.</td>
<td>Track Hub Session</td>
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<tr>
<td>4:00 p.m.</td>
<td>Poster Presentations</td>
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<tr>
<td>4:30 p.m.</td>
<td>Industry &amp; Science Spotlights</td>
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<tr>
<td>5:15 p.m.</td>
<td>Meet the Experts</td>
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<tr>
<td>6:00 p.m.</td>
<td>Industry &amp; Science Evening Events</td>
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<tr>
<td>6:30 p.m.</td>
<td>Joint Receptions</td>
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## SATURDAY, JUNE 15

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<th>Time</th>
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<tr>
<td>7:00 a.m.</td>
<td>Fun Run/Walk $</td>
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<tr>
<td>8:15 a.m.</td>
<td>Cross-Track Plenary</td>
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<tr>
<td>8:15 a.m.</td>
<td>In-Depth Symposia</td>
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<tr>
<td>9:15 a.m.</td>
<td>Panel Session</td>
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<tr>
<td>10:00 a.m.</td>
<td>Exhibit &amp; Poster Hall Open</td>
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<tr>
<td>10:30 a.m.</td>
<td>Poster Presentations</td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>Track Hub Session &amp; Career Talk</td>
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## SUNDAY, JUNE 16

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:15 a.m.</td>
<td>Cross-Track Plenaries</td>
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<tr>
<td>8:15 a.m.</td>
<td>In-Depth Symposia</td>
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<tr>
<td>9:15 a.m.</td>
<td>Panel Sessions</td>
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<tr>
<td>10:00 a.m.</td>
<td>Exhibit &amp; Poster Hall Open</td>
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<tr>
<td>10:30 a.m.</td>
<td>Poster Presentations</td>
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<tr>
<td>10:45 a.m.</td>
<td>Track Hubs &amp; Career Talks</td>
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<tr>
<td>11:00 a.m.</td>
<td>Industry &amp; Science Spotlights</td>
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<tr>
<td>11:45 a.m.</td>
<td>Track Hub: Awardee Presentations</td>
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<tr>
<td>12:00 p.m.</td>
<td>Track Hubs &amp; Career Talks</td>
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<tr>
<td>12:45 p.m.</td>
<td>Track Hubs &amp; Career Talks</td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td>Industry &amp; Science Spotlights</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>Exhibit &amp; Poster Hall Happy Hour</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>In-Depth Symposia</td>
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<tr>
<td>2:00 p.m.</td>
<td>Lounge &amp; Learn: Late Breaking Presentations</td>
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<tr>
<td>3:15 p.m.</td>
<td>Panel Sessions</td>
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<tr>
<td>4:15 p.m.</td>
<td>Meet the Experts</td>
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<tr>
<td>5:30 p.m.</td>
<td>Science and Society Keynote Session</td>
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## MONDAY, JUNE 17

<table>
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<th>Event</th>
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<tr>
<td>8:15 a.m.</td>
<td>In-Depth Symposia</td>
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<tr>
<td>9:15 a.m.</td>
<td>Panel Session</td>
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<tr>
<td>9:30 a.m.</td>
<td>Mini-Conference</td>
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<tr>
<td>10:30 a.m.</td>
<td>Research Funding Session</td>
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$ Additional fee required
Thursday Schedule

THURSDAY, JUNE 13, 2024

How To Empower Diversity And Foster Inclusivity In STEM (Registration Required)
8:00 a.m. – 4:00 p.m.
COURSE-WORKSHOP

There is a significant role for diversity in science education and the future of STEM. This session will explore the multifaceted aspects of diversity, including race, gender, ability, and socioeconomic backgrounds, and how they intersect with science education. This interactive, full day workshop will cover how to pursue STEM outreach and recruitment in areas where education disparities exist, to maintain strong mentorship relationships, develop training curricula that support equitable and inclusive learning, and present strategies to support and overcome challenges. Our speakers will share personal experiences, best practices, and success stories in promoting inclusivity within STEM disciples.

You Can’t Resist: Detecting, Characterizing, And Interpreting Antimicrobial Resistance (Registration Required)
8:00 a.m. – 4:00 p.m.
COURSE-WORKSHOP
REGISTRATION REQUIRED

Antimicrobials are unique among all therapeutic agents in that the use of an antimicrobial in one patient can compromise its efficacy in another. Therefore, an intimate understanding of antimicrobial susceptibility testing and resistance detection is essential for all those involved in the practice of clinical microbiology. Guided by subject matter experts, attendees of this workshop will be immersed in interactive presentations brimming with news you can use; covering the fundamentals of these topics as they relate to bacteria, mycobacteria, fungi, and viruses. You can’t resist attending!

Histopathology of Infectious Diseases for Clinical Microbiologists (Registration Required)
8:30 a.m. – 4:00 p.m.
COURSE-WORKSHOP
REGISTRATION REQUIRED

The histopathologic study of infectious diseases is not well-covered in most Clinical Microbiology fellowship training programs, and yet is a helpful skill for clinical practice. This updated, interactive, case-based, full-day workshop expands on previous courses to cover the fundamentals of infectious disease pathology, provide helpful algorithms and resources for everyday practice, and reinforce knowledge through an array of brand-new cases. Topics covered will include histology of commonly seen organs, inflammatory patterns associated with infectious diseases, and specific features of bacterial, fungal, viral and parasitic pathogens in tissue sections.

City Bus Tour
12:00 p.m. – 3:30 p.m.
REGISTRATION REQUIRED, ADDITIONAL FEE

Join us for an amazing tour of the City of Atlanta! Take a journey back in time as we start from downtown sites like the world-famous Underground Atlanta. Did you know Atlanta was completely burned to the ground in 1864? Come on tour with us and find out all the secrets of the city known as The Phoenix.

Biofilms MiniConference
1:30 p.m. – 4:00 p.m.
MINI-CONFERENCE
REGISTRATION REQUIRED

While research was initially focused solely on their destruction, the complexity, interactions, and utility of biofilms have been the subject of much research in recent decades. Technological advancements in e.g., sequencing and imaging have facilitated advancements in our understanding of the structure, formation, and microbial interactions within and outside of biofilms. The speakers in this mini conference will present research on ASTM methods and biofilm standards, environmental biofilms, bioremediation and biodegradation, and electrified/synthetic biofilms.

New frontiers in Shigella vaccine development: first clinical readouts from multivalent parenteral Shigella vaccines and trials among infants in low- and middle-income countries
1:30 p.m. – 4:00 p.m.
MINI-CONFERENCE
REGISTRATION REQUIRED, ADDITIONAL FEE, LUNCH INCLUDED

Shigellosis is the leading bacterial cause of diarrheal deaths globally and is associated with linear growth faltering and rising levels of antimicrobial resistance. Despite 120 years of Shigella vaccine development and clinical efficacy with a Shigella sonnei conjugate vaccine 25 years ago, there is no licensed vaccine. However, promising new-generation parenteral vaccines utilizing a range of technologies are completing clinical trials for the first time in multivalent format and/or in the target population of infants in low- and middle-income countries. This
Microbial data and tools without borders: advancing an open science ecosystem
1:30 p.m. – 4:00 p.m.
MINI-CONFERENCE REGISTRATION REQUIRED, ADDITIONAL FEE, LUNCH INCLUDED

The microbial sciences are poised to make significant contributions towards advancing the bioeconomy. To realize this future, a multiagency ecosystem supporting data, software, infrastructure, and synthesis is needed. This mini-conference will bring together resource providers spanning diverse areas of microbial science to share perspectives on data sharing and standards, broadening access, training an inclusive workforce, and the current needs to support national capacity. Panelists will highlight current tools and resources that enable the generation of Findable, Accessible, Interoperable, and Reusable (FAIR) data and discuss how FAIR data practices enable data reuse. Panelists will explore existing and future ways to support broadening access and providing learning opportunities with an emphasis on fostering interdisciplinary team science. Content will cover resources provided by the National Microbiome Data Collaborative (NMDC), the National Ecological Observatory Network (NEON), NASA GeneLab, the National Center for Biotechnology Information (NCBI), and the International Microbiome and Multi-Omics Standards Alliance (IMMSA). Attendees will participate in open discussion with panelists to outline priorities in support of a collaborative open science ecosystem that transcends existing agency and domain borders. Attendees will also gain an understanding of data stewardship best practices and an understanding of the available tools and resources that can further their research goals.

CDC’s Legacy of Triumphs and Challenges in Tackling the Biggest Microbial Challenges of Our Era
1:30 p.m. – 4:00 p.m.
MINI-CONFERENCE REGISTRATION REQUIRED, ADDITIONAL FEE, LUNCH INCLUDED

The Centers for Disease Control and Prevention (CDC) has had a significant historical role in safeguarding public health and addressing the ever-evolving microbial landscape, not only in the U.S., but throughout the world. There were many triumphs in eradicating lethal diseases, coupled with the discovery of novel pathogens with manifold implications for modern microbial sciences and clinical practice. This symposium, developed by the Center for the History of Microbiology/ASM Archives (CHOMA), will explore the most important and captivating stories of the agency’s past successes, challenges and controversies in tackling pressing microbial challenges of our time, with an emphasis on international collaboration. The symposium will look at CDC’s central role in 1) eradicating smallpox, a testament to the application of scientific surveillance principles in addressing a complex problem; 2) its work on Ebola virus, understanding sexual transmission of hepatitis B. 3) isolating the hepatitis C virus 4) isolating the organism responsible for Legionnaires disease. 5) formulating the Study of the Effectiveness of Nosocomial Infection Control (SENIC), a substantial undertaking that demonstrated, for the first time, the efficacy of recommended infection-control practices. Speakers in this session will: 1) Analyze how CDC identified the causes of Legionnaires’ disease and toxic shock syndrome during the mid-1970s and early 1980s and played a pivotal role in investigating and reporting on the emerging acquired immunodeficiency syndrome (AIDS) epidemic. Since then, CDC’s ongoing efforts in addressing AIDS have been supported by a significant portion of its budget and staff, underscoring its dedication to combat this formidable health challenge. 2) Discuss Sanchez and Heinz Feldman efforts between the mid-1980s and mid-1990s to study and characterize the Ebola virus genome. 3) Explore how CDC played a trailblazing role in the international smallpox eradication campaign. As a global leader in public health, CDC spearheaded efforts to combat smallpox, coordinating with various international partners and institutes. Through rigorous research, vaccination campaigns, and surveillance, CDC’s leadership paved the way for the successful eradication of smallpox, leaving a lasting impact on global health and showcasing the power of international collaboration in conquering deadly diseases. 4) Explain how the Venerale Disease Program, which became a part of CDC in 1957, laid the foundation for comprehensive STI surveillance, prevention, and treatment efforts. Although concentrated on syphilis and gonorrhoeae during 1950s and 1960s, its pioneering work in understanding the epidemiology of STIs and implementing public health interventions has informed current strategies to combat these infections. 5) Examine how the Tuskegee Syphilis Study impacted CDC’s approach to studying and battling infectious diseases, striving for a more equitable, inclusive and effective response to protect public health. In addition to the 2 suggested speakers listed later in this proposal, a third speaker is TBD*; topic for 3rd speaker is “The Trailblazing Role of CDC in International Smallpox Eradication Campaign” A panel discussion with session speakers/CDC reps will conclude the session.
New Therapeutic Options for Treating Gram-negative Infections; the Uprising of the Beta-lactam/ Beta-lactamase Compounds
8:15 a.m. – 10:15 a.m.

IN-DEPTH SYMPOSIUM

The recent development of novel therapeutic drugs aiming to provide novel therapeutic alternatives against infections caused by the so-called multidrug-resistant isolates opens a totally novel landscape in the bacterial-related infectious diseases field. Indeed, although very few therapeutic options were still available in many infectious contexts and in many geographical areas quite recently, there is currently a new wave of therapeutical options that are not or will soon be available. The tremendous development of β-lactamase inhibitors now provides new alternatives when combined to some β-lactam antibiotics (being either old or new molecules). Those β-lactamase inhibitors belonging to several molecule classes (i.e. diazabicycloonate-derived, boronic acid-derived, etc...) are currently under clinical evaluation, implying that fundamental and clinical investigations are currently required to i) evaluate their potency in association with some other antibacterial agents, ii) identify any possible resistance mechanisms, and iii) perform some corresponding epidemiological / surveillance surveys to better evaluate their overall efficacy and added value in different epidemiological contexts.

Immune Recognition of Microbial Troublemakers (Plenary)
8:15 a.m. – 10:15 a.m.

IN-DEPTH SYMPOSIUM

Detecting infiltration by prospective pathogens plays a crucial role in safeguarding the health and survival of organisms. Conventional pattern recognition receptors are adept at recognizing microbe-associated molecular patterns. However, this is typically too non-specific at barrier sites to discriminate an infectious threat from resident microbiota species that must be tolerated. Furthermore, several species blur this line and can be microbiota, cause routine mild disease, or deadly infections; escalation of the immune response in these circumstances would be advantageous. In recent years several exciting advances are detailing mechanisms in the threat assessment of a microbe. This session will cover emergent topics in cell-intrinsic immunity and effector-triggered immunity to discuss how cells can specifically detect pathogenesis through the activities of microbial toxins or effectors, and how successful pathogens can subvert this for their growth, survival, and transmission.

Microbial Innovations for a Sustainable Tomorrow
8:15 a.m. – 10:15 a.m.

CROSS-TRACK PLENARY

This session focuses on the intersection of microbiology and sustainability, where microbial innovations hold immense potential for shaping a sustainable future. Microorganisms play vital roles in various sustainability-related areas. In this session, we will explore cutting-edge research and transformative applications that leverage the power of microorganisms to address global sustainability challenges. Through engaging presentations and interactive discussions, attendees will discover the latest advancements in harnessing microbial capabilities for eco-friendly solutions including advanced use of genetic approaches and microbiome approaches. From novel biotechnological approaches to microbiome innovations, we will highlight the wide range of possibilities that microbes offer for creating a sustainable tomorrow. The discussion will also center on how to implement responsible and sustainable lab management to save resources and costs in microbiology everyday practice. This session aims to bridge the gap between theory and practice by providing hands-on examples on how we can live up to our responsibility of sustainability. This session is co-hosted with the ASM Young Leader’s Circle.

Brain Busters: Clinical and Public Health Microbiology
8:15 a.m. – 10:15 a.m.

IN-DEPTH SYMPOSIUM

This session is an interactive, case-based way to test your clinical microbiology knowledge and learn about the latest technologies and emerging pathogens. Four teams comprised of diverse members in infectious diseases, clinical microbiology, and public health microbiology will compete in three rounds of infectious diseases diagnostics trivia. The audience can participate alongside the teams and help provide answers when the teams need to phone a friend for assistance in answering the case question.
FRIDAY, JUNE 14

**The Rise and Fall of Proteins (Plenary)**
8:15 a.m. – 10:15 a.m.
*IN-DEPTH SYMPOSIUM*

This session will introduce the audience to critical cis and trans acting factors that control the efficiency of translational elongation in bacteria. While translational initiation can be regulated by small RNAs and RNA chaperones, the mechanisms used by bacteria to regulate translation during elongation are not as well characterized. The elongation process is a committed process, whereby termination within the reading frame does not occur unless translational errors occur. In this session, the audience will learn about tRNA modifications, synonymous codon usage, and codon context that, taken together, can fine tune translation elongation. The learner should attend this session to obtain a greater understanding of this re-emerging topic, particularly in the context of emerging epitranscriptome studies in microbial and non-microbial systems. This will also illuminate potential scenarios in various regulatory systems whereby these factors may play an unexpected but influential role in the expression of a given gene.

**Recent Advances from the Next Generation of Scientists**
8:15 a.m. – 10:15 a.m.
*IN-DEPTH SYMPOSIUM*

Research within the Molecular Biology and Physiology Track embodies a wide array of topics within the microbiological sciences. This session will highlight groundbreaking work from trainee submitted abstracts within and beyond the areas emphasized in our in-depth symposia programming.

**AI and the Search for New Antimicrobials**
8:15 a.m. – 10:15 a.m.
*IN-DEPTH SYMPOSIUM*

The ever-increasing emergence of drug-resistant microbial pathogens emphasizes the need for innovation in the drug discovery field. Artificial intelligence (AI) and machine learning algorithms could revolutionize the search for new antimicrobial agents. Over the last decade, monumental technological advances have led to an increase in AI-integrated drug discovery endeavors. This session will explore how AI is transforming and expediting the search for new antibiotics.

**Impact of Metabolism on Microbial-host Interactions**
8:15 a.m. – 10:15 a.m.
*IN-DEPTH SYMPOSIUM*

The gut microbiota utilizes, interacts and transforms GI metabolites to mediate growth, virulence, and regulate the host. Recent advances to analyze the consequences of such manipulations on a genome- and system-wide level have revealed unexpected connections between metabolism and virulence. These metabolic interactions have a significant impact on human health. This session highlights some of these recent discoveries and the impacts they are having on our understanding of host-microbiome crosstalk through these important molecules in the human gut.

**Fine-Tuning Beta-Lactams: Prolonged Infusion Therapy and Therapeutic Drug Monitoring**
8:15 a.m. – 10:15 a.m.
*IN-DEPTH SYMPOSIUM*

This session will be focused on optimizing PK/PD to achieve targeted concentrations to overcome resistance and promote positive patient outcomes.

**Synthetic Biology for Natural Products Discovery and Production**
8:15 a.m. – 10:15 a.m.
*IN-DEPTH SYMPOSIUM*

This session will present updates on synthetic biology approaches to define and activate novel/cryptic gene clusters and create means of increasing specificity and yields.

**Phage Therapy in the Age of AMR: Strategies to Accelerate Phage Therapy from Lab to Market**
8:15 a.m. – 10:15 a.m.
*IN-DEPTH SYMPOSIUM*

In the face of rising antimicrobial resistance (AMR), phage therapy emerges as a promising countermeasure. This session offers a deep dive into the journey of phages from laboratory discovery to clinical application. We'll tackle key challenges from pre-clinical validation and clinical trials to regulatory complexities and production scalability. Through expert insights and collaborative discussions, attendees will gain a comprehensive understanding of current barriers and strategies to expedite the market readiness of phage therapies in the AMR era. Ideal for professionals in antimicrobial research, phage biology, clinical therapeutics, and regulatory domains.
Can Artificial Intelligence solve environmental microbiology’s greatest challenges?

9:15 a.m. – 11:15 a.m.
PANEL DISCUSSION

Regenerative AI models such as ChatGPT have revolutionized the way we interact with online information and have presented new opportunities for various scientific disciplines, including environmental microbiology. Indeed, these could be of value in exploring and analyzing complex datasets. In this panel, we will explore ChatGPT’s potential to tackle one of environmental microbiology’s “grand challenges”: The identification of processes, patterns, and relationships across disparate datasets, and consider the advantages and limitations of using such models in environmental microbiology—and microbiology writ large. Environmental microbiology began over two hundred years ago, and since its inception has faced the challenge of deciphering complex and intricate relationships between biological, geochemical, and physical factors. The complexity of these data hinders the identification of patterns and relationships in natural and anthropogenic environments. Regenerative AI such as ChatGPT is, by nature, ideally suited to identifying patterns in its training dataset (the “corpus”) and presenting distillations of those patterns in readily accessible formats. Thus, environmental microbiologists can potentially leverage its natural language processing abilities to explore intricate datasets more efficiently. There is an opportunity to adapt such models specifically to environmental microbiology. For example, the model could be trained on environmental microbiological data, and as it becomes better acquainted with these datasets and the field’s nuances, it might develop a more effective capacity to offer domain-specific insights that enhance scholars’ understanding of patterns and processes in microbial ecosystems. Via these explorations, researchers can iteratively refine their questions and investigate novel hypotheses, ultimately leading to more precise and targeted investigations. That said, and despite its remarkable potential, several questions remain regarding these models’ efficacy in enhancing scientific discovery. First, given the complexities of natural ecosystems, will they be able to comprehend and process such vast volumes of data without introducing biases or oversimplifications? Next, how well can models handle very disparate data types, for example biological (e.g., cellular physiology, genetic expression and regulation, genomic evolution), geochemical (e.g., spatial and temporal variation in local and regional chemistry), and physical (e.g., variations in barometric or hydrostatic pressure, water activity, etc.) data? Finally, will they be able to offer rigorous statistical analyses and avoid spurious correlations that may mislead researchers? As regenerative AI models continue to evolve, they hold significant promise for transforming the way researchers access and analyze information. Nevertheless, the successful application of large language models to environmental microbiology relies on addressing potential limitations and biases and recognizing the model’s role as a tool to complement, rather than replace, scholarly expertise. To put it succinctly, the microbial community is going to have to actively engage with these models and determine if/how they are suitable for the aforementioned applications (among others). As such, it is essential to critically assess their efficacy in advancing scientific inquiry and to establish responsible practices to ensure reliable and meaningful discoveries in the field.

“Game On!” – The Utilization of Apps, Card-Based Games, and Board-games in Medical Education

9:15 a.m. – 10:15 a.m.
TRACK HUB

There has been an explosion in the creation of different games & apps targeting the medical sciences. Many of these have been designed and produced by subject matter experts (MD, PharmD, PhD, etc.) with the intent of providing a fun and alternative means of medical education for trainees and all learners. In this session, we will discuss some of the merits and pitfalls of medical education games (MEGs) as it pertains to microbiology and other subjects, as well as provide an opportunity for attendees to play some of the games provided.

Practical Approaches to Establishing and Maintaining Successful Industry Research Partnerships

9:15 a.m. – 10:15 a.m.
PANEL DISCUSSION

This panel discussion will provide an overview to junior-level clinical and public health microbiology faculty with an interest in developing diagnostic research programs. Senior clinical microbiologists and industry executives with active research programs will share their experience navigating regulatory and institutional requirements as part of industry-sponsored research programs. This session will provide a framework to tackle the logistics and challenges of establishing and maintaining an externally funded research program.
Friday Schedule

FRIDAY, JUNE 14

Breaking Boundaries: US Fungal Meningitis Outbreak following Medical Procedures
10:45 a.m. – 11:30 a.m.
TRACK HUB

This session discusses recent outbreaks of human disease associated with devices and medical procedures, including the current outbreak of fungal meningitis due to Fusarium solani amongst persons who received epidural anesthesia in Mexico as well as tuberculosis associated with bone allograft material.

Bringing Outreach In; Making Outreach Mainstream to Increase STEM Recruitment
10:45 a.m. – 11:30 a.m.
CAREER TALK

As we study the "pipeline" problem of recruiting and retaining in science, we see that STEM-themed outreach events can be vital to exposing young students to science and potentially inspiring them to pursue science as a career. Opportunities for introductions to science fields and activities can be particularly important in areas where education disparities exist, and school districts may not have structures in place to support strong science programs and therefore students may not even consider science as an area of interest or a career option. Educational events aimed at children and adults have an added benefit of community education, engagement, and can enhance public trust of science in the general public as a whole. This session will address the value and impact of outreach and strategies for incorporating outreach events into “big” science.

Mobile-ome Revolution: Advancements in Mobile- and Genome-Resolved Metagenomics for Plasmids and Phages
10:45 a.m. – 11:30 a.m.
TRACK HUB

Major developments in third-generation sequencing technologies have moved the field of genome-resolved metagenomics from the realm of the “possible,” to now being prevalent. Alongside these advances has been an expansion of tools and methods that have made it increasingly feasible to study the “mobile-ome”: the collection of mobile genetic elements that mediate diverse processes including phage infection, horizontal gene transfer (HGT), transmission of pathogenicity, and antimicrobial resistance (AMR) mechanisms. Our speakers will present cutting-edge research on these techniques to explore the composition, role, and host-range of mobile genetic elements. They will highlight the transformative power of long-read and proximity-ligation sequencing technologies, along with other novel approaches, to explore the mobile-ome in diverse microbial communities. Attendees will gain insights into the latest advancements which allow for the reliable discovery and host-attribution of these mobile genetic elements without the need for culturing. We will explore the challenges and opportunities which arise from analyzing these information-rich datasets and will highlight published and unpublished discoveries resulting from the application of “mobile-resolved” metagenomics.

Time Travelling Pathogens
10:45 a.m. – 11:30 a.m.
TRACK HUB

This session will discuss the potential for new pathogens to emerge as permafrost thaws.

Supporting Sustainable Outreach Initiatives through Hands-on Community Engagement
10:45 a.m. – 11:30 a.m.
TRACK HUB

Effective science outreach plays a critical role in bridging the gap between researchers and the public, fostering understanding, and inspiring the next generation of scientists. This session will dive into successful outreach strategies, such as community engagement programming and showcasing the community work of the ASM Young Ambassadors and Young Leaders Circle. Attendees will gain valuable insight in designing impactful and sustainable outreach initiatives to effectively communicate complex microbiological concepts to diverse audiences. Emphasis will be on how to effectively convey intricate scientific concepts, like the mechanisms of microbial life at the molecular, cellular, and multi-cellular level. The overarching objective is to encourage microbiologists to participate in science outreach to enhance societal science literacy while nurturing the budding scientific minds of tomorrow.

Microbiology Careers Outside Academia: Navigating through Government Opportunities
10:45 a.m. – 11:30 a.m.
LOUNGE AND LEARN

This session will provide attendees the opportunity to learn more about career opportunities outside of the traditional academic route and focus on jobs in the governmental sector. Presenters will discuss their perspectives and share experiences from both the federal and state levels. This will be an interactive panel discussion that allows for questions from the audience to be answered by the panelists.
Friday Schedule

FRIDAY, JUNE 14

Data Analysis in Microbiome Studies
10:45 a.m. – 11:30 a.m.
TRACK HUB

Microbiome studies based on characterization of the composition of microbes through high-throughput sequencing has led to conclusions regarding the participation of microbes in various disease states. Recent studies have suggested that there are specific associations between specific bacterial species and specific disease outcomes. If true, these associations can provide a scientific basis to interrogate whether these novel bacterial species are causing the disease outcome or a consequence of the disease outcome. However, independent analysis of the data from these studies suggest that the processing of the data has led to several systematic errors. Thus, the conclusions drawn from the results of this analysis should be reconsidered. Furthermore, this session will discuss the key processes in data processing that can lead to the introduction of unintended systematic errors.

Green Cards for Scientific Researchers: How to Win Your EB-1A/NIW Case
12:45 p.m. – 1:30 p.m.
CAREER TALK

Learn about the U.S. immigration process and how to maximize your chances of immigration success from attorney Brian Getson. Mr. Getson’s presentation will help scientists learn how to obtain a green card in the U.S. through the EB-1A and NIW categories and how to avoid costly immigration mistakes. Participants will be able to set up one on one consultations with the speaker following the session.

Changing Abortion Laws and It’s Implications for Sepsis and Maternal Mortality
12:45 p.m. – 1:30 p.m.
TRACK HUB

After the legalization of abortion in the United States in 1973, the risk of infectious morbidity and mortality from this procedure notably decreased. With increasingly restrictive legislation targeting access to safe abortion services, reviewing infectious complications of unsafe pregnancy termination is crucial, particularly the diagnosis and management of life-threatening clostridial and related anaerobic bacterial infections that can complicate unsafe abortion. It is important for clinicians and microbiologists to re-familiarize themselves with these infections and the causal pathogens.

Computational Approaches for Identifying Bacterial Outer Membrane Proteins
12:45 p.m. – 1:30 p.m.
TRACK HUB

Outer membrane proteins of Gram-negative bacteria are frequently the focus of vaccine targets, yet many outer membrane proteins remain poorly understood. This track hub will describe the development of an algorithm to classify bacterial membrane proteins based on their amino acid sequence. This web-accessible database (IsItABarrel) can be used to identify new features and functions of outer membrane proteins, which will be a useful tool for uncovering new targets for vaccine development.

Antimicrobial Resistance (AMR) coming into Existence: Overview of AMR and the Real-World Use of Novel Beta-Lactams in the Pediatric Population
12:45 p.m. – 1:30 p.m.
TRACK HUB

This session will provide a broad scoping review of antimicrobial resistance within the pediatric population and provide real-world perspectives on the use of novel beta-lactams to mitigate the observed resistance.
## Friday Schedule

### FRIDAY, JUNE 14

**Journeying Through Time: Understanding Historic Pandemics through Ancient Bacterial DNA**  
12:45 p.m. – 1:30 p.m.  
*TRACK HUB*

Ancient bacterial DNA holds a wealth of information about the evolution and origin of human pathogens and the causal agents of historic pandemics. Through cutting-edge techniques and advancements in genomic analysis, researchers can now extract and sequence DNA from ancient specimens, unlocking hidden secrets from the past. In this session, we will explore and discuss the unique challenges and methodologies involved in sequencing ancient bacterial genomes. Additionally, we will delve into the implications for understanding the evolution of microbiomes, virulence factors, and antimicrobial resistance, shedding light on the origins and spread of these crucial aspects of bacterial pathogens. Attendees will gain a deeper understanding of how this field of research contributes to our knowledge of microbial evolution, the impact of pathogens throughout history, and the potential implications for modern healthcare.

**Taking a Pathobiome Approach to Disease**  
12:45 p.m. – 1:30 p.m.  
*IN-DEPTH SYMPOSIUM*

**Antifungal Drug Resistance and Emerging Fungal Pathogens**  
1:45 p.m. – 3:45 p.m.  
*IN-DEPTH SYMPOSIUM*

The incidence of invasive fungal infections and the prevalence of drug-resistant fungi has increased worldwide. Fungal pathogens are emerging at an alarming rate due to environmental changes and expansion of at-risk populations. In this session, speakers will highlight the changing landscape of fungal pathogens and infections, highlighting recent advances in our knowledge of antifungal drug resistance, host-pathogen interactions, and how fungi can adapt to environmental stressors. Such information is critical to guide interventions to address antifungal resistance and emerging fungal pathogens.

**Are Tetracyclines Cool Again?: Exploring Advancements in Tetracycline Chemistry and Clinical Application**  
1:45 p.m. – 3:45 p.m.  
*IN-DEPTH SYMPOSIUM*

This session will discuss the chemical alterations in tetracyclines designed to increase activity against MDR organisms. The session will also discuss tetracycline protective benefits against C. difficile and benefits in clinical application.

**Are We Missing Something?: The Resurgence of Hard-to-treat Gram-positive Infections**  
1:45 p.m. – 3:45 p.m.  
*IN-DEPTH SYMPOSIUM*

The focus of this in-depth symposium is to enlighten the participants about the intricate dynamics surrounding the resurgence of invasive Group A Streptococcus (iGAS) infections. Our aim is to delve into the complex interplay of factors contributing to this resurgence, including viral co-infections, age-related susceptibility, and the impact of vaccination strategies. By exploring these intricate connections, we seek to deepen understanding and enhance awareness regarding iGAS infections and their implications for clinical practice, public health measures, and interdisciplinary research efforts.

**The Promise of a Microbe-driven Bioeconomy**  
1:45 p.m. – 3:45 p.m.  
*IN-DEPTH SYMPOSIUM*

This session will summarize key concepts of bioeconomy and strategies to achieve circular economies that create fuel, chemical, food and materials.

**With a Little Help from My Friends: Using Marine Probiotics to Protect Food and Health**  
1:45 p.m. – 3:45 p.m.  
*IN-DEPTH SYMPOSIUM*

This session will present novel probiotics and techniques aimed at increasing yield in aquaculture and protecting marine organisms from disease.
Friday Schedule

FRIDAY, JUNE 14

Wound Cultures from Bench to Bedside – Review of What’s New and a Clinician’s Perspective.
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Join an Infectious Diseases Physician and a Clinical Microbiologist to explore the complex workup of wound cultures through example cases and an interactive discussion. The session will cover the latest updates in wound cultures with a focus on diabetic wounds and prosthetic joint infections. Learn what your patients' providers wished you knew and how the laboratory can help.

Ebola and Marburg Viruses: Have We Tamed the Beasts?
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

It has been 10 years since the 2014 West Africa Ebola epidemic, the largest Ebola outbreak in history. While Ebola has faded from headlines, much work has been done to prevent and combat future outbreaks, and this session will update the audience on the developments in medications and vaccines, healthcare infrastructure, and sociopolitical and economic conditions. Globalization has also increased the likelihood of an outbreak by another filovirus, Marburg virus, and this session will update the audience about progress made for this deadly virus as well.

The Year in Clinical Microbiology
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

The most important publications in clinical microbiology from the previous year will be discussed. Editors from the "Journal of Clinical Virology" and the "Journal of Clinical Microbiology" will discuss significant papers about diagnostic testing for viruses, bacteria, fungi and mycobacteria, as well as antibiotic susceptibility testing and testing stewardship. Publications from a variety of journals will be discussed. Attendees will gain an understanding of the significant advances in clinical microbiology in the past year.

Phage-encoded Auxiliary Metabolic Genes (AMGs) in Human and Environmental Microbiomes
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Since their discovery, Auxiliary Metabolic Genes (AMGs), i.e., metabolic genes encoded by bacteriophages and used to complement or reprogram the metabolism of their host cell, have captivated the field of viral ecogenomics. Because the existence of these genes unexpectedly suggested phage infections could deeply impact microbial metabolism, many tools and studies were dedicated to the search for more AMGs. From only a handful of experimentally characterized examples, metagenome analyses now routinely report hundreds to thousands of "AMGs" from uncultivated phages. In this session, attendees will hear about the latest examples of phage-encoded metabolic genes that have been discovered and, for some, experimentally characterized, including the potential role(s) of these AMGs in impacting microbial metabolism and biogeochemistry across ecosystems. Attendees will also learn about the limits of AMG detection from (meta) genome analysis recently highlighted, as well as newly proposed frameworks to better identify and classify phage-encoded genes involved in various phage-host interactions, including but not limited to metabolic genes.

Enhancing Methane Mitigation Strategies Via Methanogenesis & Methanotrophy
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Methane is a potent greenhouse gas but has a short atmospheric residence time of about 12 years. Consequently, effective mitigation of methane emissions and/or removal of methane from the atmosphere can be a fast-acting and important lever to slow climate change. Significant sources and sinks of methane include microbial processes in agriculture, waste management and natural ecosystems. Several designs for using filters or biofilms to remove methane from environments with elevated concentrations depend upon microbial components. This session will highlight how advancements in our understanding of microbial diversity, methanogenesis and methanotrophy inform mitigation options in engineered systems, agriculture, and natural ecosystems to reduce overall methane emissions.
Friday Schedule

FRIDAY, JUNE 14

Microbial Dynamics within Their Hosts
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Populations of microorganisms undergo complex dynamics when they colonize or infect their hosts, such as heterogeneous patterns of replication, dissemination to distal sites, and stringent bottlenecks that constrain diversity. This session will explore these hidden dynamics and how they influence the outcomes of host-microbe interactions. Presentations will leverage technologies that enable monitoring of distinct clones within microbial communities to reveal how microbes replicate, traffic, and are cleared from their hosts. Findings will highlight how these population dynamics are controlled by various factors, such as the microbiota, the host innate immune system, and pathogen-encoded virulence genes. Together, this session will examine the unseen population dynamics of microbes across different animal models, providing a quantitative exploration of microbial behavior within their hosts.

Advances in Polysaccharide Capsule Export and Function
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

This session will highlight several new advances in our understanding of production, regulation, and function of capsule, an essential virulence factor in many pathogens. Topics covered by invited speakers will include 1) an overview of capsule production from structural biology perspective covering recent discoveries from new structural analyses, and 2) new or expanded role(s) for capsule in virulence or a novel mechanism regulating capsule gene transcription or capsule function. Other topics we anticipate including are recent use of phage therapy targeting capsules and adaptive evolution of capsules. We will target topic diversity with a goal of including talks on 3-4 different organisms. Emphasis will be placed on compiling a diverse cohort of speakers from the abstracts in race/ethnicity, gender, and career stage.

Microbial Responses to Stressful Environments
- A Focus on Metabolism
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Microorganisms are exposed to a large and diverse number of stressors both in their natural and host environment. To survive these potentially hazardous conditions, organisms must be able to respond to changes in their environment. The presentations can encompass a range of sub-topics such as the molecular mechanisms and signaling pathways governing these processes, the role of secreted metabolites, and the evolution of resistance mechanisms.

Antagonistic Microbial Interactions
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Microbial populations face a diverse set of antagonistic challenges in their microecosystems. Recently, the molecular and evolutionary mechanisms governing such behaviors have been the focus of several studies – made possible by latest cutting-edge techniques. This session will focus on microbial antagonistic behaviors such as predation, phage-induced lysis, secretion of antimicrobial compounds and proteolytic agents, and resistance mechanisms against antagonism. The presentations can encompass a range of sub-topics such as the molecular mechanisms and signaling pathways governing these processes, the role of secreted metabolites, and the evolution of resistance mechanisms.
Friday Schedule

FRIDAY, JUNE 14

Bench to Bedside: Challenging Clinical Cases - Part 1
3:15 p.m. – 4:15 p.m.

PANEL DISCUSSION

Following William Osler’s advice ‘have no teaching without a patient for a test’, this cross-track symposium allows attendees to learn from a diverse array of challenging clinical cases. The diagnosis and management of four highly interesting and unusual patient cases will be presented by CPEP (or infectious diseases) fellows, with Q and A discussion facilitated by 2-3 experts in the field of public health, clinical microbiology and infectious diseases. This would be a cross-track symposium between CIV and CPHM, with cases and presenters identified via outreach to trainees and faculty. The session will offer trainees a chance to present their best cases, but we anticipate broad appeal of the session to an audience ranging from novice to expert.

Molecular Biology and Physiology (MBP) Community Meet-Up
4:00 p.m. – 4:45 p.m.

TRACK HUB

Join the Molecular Biology and Physiology (MBP) community for a meet-up! Connect with colleagues to discuss topics relevant to your scientific track community. This event is moderated by the ASM Council on Microbial Sciences (COMS) MBP Community Leader and the ASM Microbe MBP Track Leader.

Applied and Environmental Science (AES) Community Meet-Up
4:00 p.m. – 4:45 p.m.

TRACK HUB

Join the Applied and Environmental Sciences (AES) community for a meet-up! Connect with colleagues to discuss topics relevant to your scientific track community. This event is moderated by the ASM Council on Microbial Sciences (COMS) AES Community Leader and the ASM Microbe AES Track Leader.

Clinical and Public Health Microbiology (CPHM) Community Meet Up
4:00 p.m. – 4:45 p.m.

TRACK HUB

Join the Clinical and Public Health Microbiology (CPHM) community for a meet-up! Connect with colleagues to discuss topics relevant to your scientific track community. This event is moderated by the ASM Council on Microbial Sciences (COMS) CPHM Community Leader and the ASM Microbe CPHM Track Leader.

Use of Defined Microbiomes to Interrogate Host-microbe Interactions
4:00 p.m. – 4:45 p.m.

TRACK HUB

Microbiome studies are complicated by the unique microbiome that exists in different individuals and multi-omics approaches that cannot determine the gut microbiota’s causative role in disease. One strategy to reduce the complexity is the use of genetically tractable defined microbiota communities to dissect host-microbiome and commensal-pathogen interactions. The speaker will discuss the advantages and disadvantages of these approaches and strategies that can be used to design mechanistic microbiome studies.

Ecology of Chemosythetic Environments
5:15 p.m. – 6:15 p.m.

MEET-THE-EXPERT

Description TBD*

Meet the Expert: ASM Honorary Diversity Lecturer Awardee
5:15 p.m. – 6:15 p.m.

MEET-THE-EXPERT

This year’s award winner will discuss research, policy, publications, and other pursuits throughout an illustrious career.
Friday Schedule

FRIDAY, JUNE 14

Multiplexed PCR Panels for Diagnosis of Infectious Diseases: Perspective from the Laboratory
5:15 p.m. – 6:15 p.m.

MEET-THE-EXPERT

This session will provide an update on the use of commercial FDA approved PCR panels and the success and challenges of these rapid diagnostic platforms. Specifically, it will be a discussion of the experience in using the PCR panels for a syndromic etiologic diagnosis and its impact on patient care.

Let’s Have a (Ka)Hoot!
5:15 p.m. – 6:15 p.m.

MEET-THE-EXPERT

An ice breaker session for MBP community.

Unraveling COVID-19: Molecular Insights and Therapeutic Strategies Targeting SARS-CoV-2 Spike Protein
5:30 p.m. – 6:30 p.m.

MEET-THE-EXPERT

The spike protein of SARS-CoV-2 is the major determinant of the COVID-19 pandemic. Early on, our decade-long structural studies of the related SARS-CoV-1 spike protein facilitated predictions regarding the receptor usage and host range of SARS-CoV-2. Our subsequent studies identified three unique molecular mechanisms of the SARS-CoV-2 spike protein, revealing its enhanced capability to infect human cells. These critical insights were instrumental in the development of therapies aimed at blocking SARS-CoV-2 entry into cells.
A heteroresistant population is defined as a subpopulation of resistant cells within a mixed population of resistant and susceptible bacteria. This phenomenon presents a significant challenge to clinicians and diagnostic microbiologists, as it can lead to the development of antimicrobial resistance, which can be difficult to detect and manage. The challenges stem from the lack of standardized methods of detection and the phenotypic instability associated with heteroresistance. The heteroresistant subpopulation can co-exist with a majority of susceptible bacteria, making it difficult to address resistance development and overcome the challenges it presents.

**New Mechanisms in Viral Resistance: Special Considerations for Clinical Practice**
8:15 a.m. – 10:15 a.m.

**IN-DEPTH SYMPOSIUM**

This session will provide a broad overview of newly identified viral resistance and strategies for overcoming hard to treat infections.

**Data Science and Microbial Systems in Food Safety (Plenary)**
8:15 a.m. – 10:15 a.m.

**IN-DEPTH SYMPOSIUM**

Bacterial persistence across food systems is a complex challenge. Multiple bacterial genera survive in non-host environments and are linked epidemiologically to cases of foodborne illness. Analysis of metadata, including climactic and processing conditions, in combination with genomic tools are used to identify influential patterns in bacterial survival and persistence in pre- and post-harvest food systems. Functional genomics can be used to evaluate mechanisms of persistence across food systems as well as for the development of mitigation and control mechanisms to enhance food safety. Genomic and physiological data are then applied to epidemiological models to better understand the burden of foodborne illness.

**Crossing Paths: Microscopy Across Clinical Laboratories for the Unified Diagnosis of Infection**
8:15 a.m. – 10:15 a.m.

**IN-DEPTH SYMPOSIUM**

There are numerous advanced diagnostic modalities for the diagnosis of infections, though they are not widely available to all laboratories. Microscopic evaluation of stained direct specimen smears and cultures in microbiology, and of cytopathologic and histopathologic preparations in anatomic pathology can provide valuable diagnostic information and are available to most laboratories. Recognizing distinct microscopic morphologic features of infectious microorganisms continues to be an important skill for microbiologists and integrating findings obtained from different specimen preparation types can help establish an early diagnosis with improved accuracy. Often, arriving at the correct diagnosis based on direct morphology requires a synthesis of microscopic findings, a knowledge of available staining techniques and a familiarity with specimen processing. This session will focus on reviewing key morphologic features seen from different microscopic specimen preparations with an overview of specimen processing, focusing on body fluids, tissues, and gastrointestinal specimens. Sample cases will be presented to demonstrate the importance of collaborations between the microbiology laboratory and other areas of clinical and anatomic pathology.

**When Hoofbeats Reveal Zebras: Atypical Infections in Immunocompetent Populations**
8:15 a.m. – 10:15 a.m.

**IN-DEPTH SYMPOSIUM**

This session will explore non-traditional infections in healthy immunocompetent individuals that arise from atypical scenarios such as natural disasters, wilderness settings, military deployments, and warzones. The symposium will highlight unexpected infections with multidrug resistant bacteria affecting casualties in Ukraine, invasive
fungal infections after natural disasters, and infections associated with diverse environmental sources: marine, freshwater, and soil sources. This symposium promises to be an enriching and thought-provoking event, covering unexpected infections in otherwise healthy populations.

What’s New with HIV Diagnostics? Laboratory Challenges in the Era of Highly Potent Antiretrovirals
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Because of highly potent antiretrovirals (ARVs), persons with HIV (PWH) are able to live full lives and, together with the availability of both preexposure (PrEP) and postexposure (PEP) prophylaxis regimens, transmission of HIV has the potential to be halted – the ultimate objective of Ending the HIV Epidemic in the US (EHE). The future looks bright – so why attend a session on laboratory challenges in HIV diagnostics? These improvements in HIV prevention and treatment can cause significant diagnostic dilemmas for the clinical microbiology laboratory. From the development of antiviral resistance to delayed seroreactivity and even suppression of RNA detection, clinical microbiologists need to be aware of the unintended consequences of newer ARVs. In this session, we will look at the rise in proviral resistance testing to aid in switching patients to long-active ARVs, the need to include resistance panels for newer ARVs (such as cabotegravir and doravirine), troubleshooting RNA nonreactive/ delayed seroreactive/occult infection cases in the context of PrEP and PEP, and the role of DNA testing within HIV diagnostics.

Novel Approaches and Challenges of Laboratory Diagnosis of Invasive Fungal Diseases
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

This session will highlight recent advanced using novel plasma cell-free PCRs as a non-invasive approach for diagnosis of invasive aspergillosis, mucormycosis, pneumocystis pneumonia, and other invasive fungal diseases. Fungal diseases of the central nervous system (CNS) have been increasingly recognized, particularly from a recent outbreak possibly caused by Fusarium associated with contaminated epidural anesthesia procedures performed in clinics in Mexico. However, laboratory diagnosis of fungal diseases of the CNS remains challenging and progress including utilizing fungal biomarkers or next generation sequencing is reviewed in this session. Furthermore, the challenges of diagnosing invasive fungal diseases in pediatric patients are reviewed and strategies to improve their detection are discussed.

How to Train Your Microbiome (Plenary)
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

As the number of characterized microbiomes has increased over the past few decades, and our understanding of relationships between microbiome composition and phenotypic effects on hosts has increased, research efforts have shifted towards learning new ways to effectively design and shape microbiomes using ecological and evolutionary principles. This symposium will explore how we can use ecological principles to manipulate microbiomes in intended ways and will explore the ways in which host organisms can craft and control their own microbiomes.

Climate Change, AMR, and Global Surveillance of Emerging Microbes
8:15 a.m. – 10:00 a.m.
CROSS-TRACK PLENARY

The COVID-19 pandemic reminded the world of the potential destructive power of microbes. Though not new, antimicrobial resistance has always been a major public health concern to society. The impact of the changing climate on microbes leading to resistance to current treatments cannot be overlooked. The purpose of the session is to look at microbial surveillance, interactions of microbes and hosts, and potential public health response to antimicrobial resistance globally to gain new insights about our current readiness and the important steps that the scientific community (from basic, applied and clinical microbiology) will need to take to prepare ourselves for the possible future. This plenary session will be convened by the American Academy of Microbiology (Academy), which is the honorific leadership group & scientific think tank within the American Society for Microbiology (ASM). The Fellows of the Academy are experts in their respective fields. Every year, the Chair of the Academy Governors invites distinguished experts to discuss an important topic in microbial sciences. The intention is to bring the attention of the community toward that topic and stimulate discussions and action to advance that area.

It Takes Two to Tango: How the Molecular Crosstalk of Protein Evolution and Target Recognition Guides Cell Signaling
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Biology often relies on gene duplication to generate divergent protein-protein interactions and evolve novel cell signaling...
functions. How functionally robust are these events, do they generate crosstalk between otherwise insulated pathways, and how does nature avoid detrimental crosstalk? Experts Dr. Michael Laub and Dr. Jeff F. Miller will provide mechanistic insights into such protein evolution and molecular recognition events using examples of deep mutational scanning and diversity generating retroelements.

Protect the Barrier!: The Essential Bacterial Cell Envelope (Plenary)
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

In this session, we will scrutinize how bacterial cells employ various mechanisms to ensure bacterial survival and fitness in diverse, often hostile, environments. The bacterial cell envelope is a multilayer structure that protects bacteria from the environment. However, bacterial cells utilize several mechanisms to cope with environmental cues, stresses, and microbial insults including alterations in metabolic states and physiology, the formation of spores, induction of bacterial variants such as L-forms, and the use of secretion systems, appendages, and nanomachines to allow broad behaviors including DNA uptake. As a result, this session will delve into how these mechanisms are at play in response to environmental conditions and how these can be utilized to improve current therapies.

New Approaches to Antimicrobial Stewardship: Utilizing Telestewardship to Mitigate AMR
10:45 a.m. – 11:30 a.m.
TRACK HUB

This session will discuss antimicrobial resistance and the utility in telestewardship in optimizing antimicrobial regimens and mitigating resistance.

CLSI’s New Guidance on Antifungal Intrinsic Resistance and Reporting by Body Site
10:45 a.m. – 11:30 a.m.
TRACK HUB

The Clinical and Laboratory Standards Institute (CLSI) recently released new guidance on intrinsic resistance of yeasts and molds and reporting restrictions by body site. These reporting guidelines have been recently published in various CLSI antifungal documents. This session will cover the process and criteria by which intrinsic resistance was determined by CLSI for various organism-antifungal combinations and for which body site reporting restrictions were applied. Speakers will present case scenarios to demonstrate various ways in which these new antifungal reporting guidelines can be incorporated into a laboratory’s protocols.
Saturday Schedule

SATURDAY, JUNE 15

Quick Chat on Rapid AST
10:45 a.m. – 11:30 a.m.
TRACK HUB

Numerous rapid susceptibility test systems are being developed and brought to market: Selux, Q-Linea, bioMerieux (Specifc) Reveal, QuickMIC, LifeScale, Accelerate, rapid KB. This session will provide a brief overview of the technologies.

Global Clinical Phage Rounds: Oh, the Places Phages and Phage Clinicians will Go!
10:45 a.m. – 11:30 a.m.
TRACK HUB

Due to antimicrobial resistance epidemic and lack of production and access to new antibiotics clinicians are returning to a 100-year-old strategy and adapting it for modern personalized medicine. Bacteriophage or phage therapy is increasingly seen as the last resort antibacterial solution for difficult to treat infections that would otherwise require either extensive surgery, lifelong antibiotics, or palliation. Global Clinical Phage Rounds is where phage clinicians and their laboratory colleagues meet monthly to discuss challenging cases and progressive methods of providing Phage therapy for compassionate and clinical research use. We have over 150 physicians and phage researchers in our group. Leading this virtual collaboration is the Mayo Clinic, the Canadian and European Microbiology & Infectious disease societies, as well as Phage Australia. Each country that has participated has had a unique production, regulatory and clinical microbiology path to bring phage therapy to the bedside. Come join us and participate in our global journey as we discuss challenging and groundbreaking phage therapy cases.

Deciphering Microbial Phenotypic Heterogeneity with Single-Cell RNA Sequencing of Complex Samples
10:45 a.m. – 11:30 a.m.
TRACK HUB

In this session, we will explore high throughput transcriptome quantitation of thousands of single bacterial cells. The speaker will discuss new biological insights into the extent of bacterial phenotypic heterogeneity afforded by these technological advances, such as metabolic division of labor, bet-hedging strategies, variation in pathogenic gene expression and heterogeneous responses to stress. It will also highlight the potential of the new methodologies to uncover new aspects of bacterial biology with high-resolution and discuss future research directions they enable for the field.

Mass Spectrometry-Based Approaches to Bacterial Lipidomics And Metabolomics
10:45 a.m. – 11:30 a.m.
TRACK HUB

Cutting-edge bioanalytical methods using ion mobility-mass spectrometry (IM-MS) enhance the throughput and dimensionality of bacterial lipidomics and metabolomics. This session will feature new MS approaches towards characterizing the metabolic alterations in antibiotic resistant pathogens and developing IM-MS methods for antibiotic susceptibility testing and small molecule screening.

Synthetic Biology Approaches to Study Microbial Development
10:45 a.m. – 11:30 a.m.
TRACK HUB

Synthetic biology is an interdisciplinary field that focuses on designing and engineering biological components, pathways, and organisms at the molecular level to create novel, artificially constructed microbial systems with specific functions. This session will consider how synthetic biology strategies can be applied to questions in microbial development, including the advantages and disadvantages of these approaches. Strategies will include bottom-up reconstitution of signaling pathways in distantly related organisms to construct and deconstruct how pathways work. Moreover, biosensors can be engineered to track key metabolites, secondary messengers, quorum-sensing molecules or cell-cycle checkpoint events. These synthetic biology strategies will be leveraged to understand how a subcellularly localized signaling pathway regulates the asymmetric division of Caulobacter crescentus.
Saturday Schedule (continued)

SATURDAY, JUNE 15

Microbiology in Microgravity: A History of Space Biology Hardware and How It Applies to Your Science  
12:45 p.m. – 1:30 p.m.  
TRACK HUB

Anyone interested in exploring how their science could be enabled in space should consider attending this talk. This activity will review a short history of hardware and other tools that have enabled space biology experiments, the challenges of working in an extreme environment, and the NASA-defined processes of preparing for a flight project. If the learner is interested in the microgravity environment, boundary-pushing research, or wants to take their current research to the next level, this talk is for them. If the learner is only casually interested in spaceflight experiments, this talk is for them!

Clinical Microbiology Virtual Journal Club - Live!  
12:45 p.m. – 1:30 p.m.  
TRACK HUB

This session is the live, in-person continuation of the long-running monthly Clinical Microbiology Virtual Club. Presenters and panelists will discuss a recent publication and discuss the details, impact, and implications of the study.

Preparing for a Cyberattack  
12:45 p.m. – 1:30 p.m.  
TRACK HUB

Cyberattacks are increasingly common in medicine. One presenter will give their experience in a clinical microbiology laboratory during a 25-day downtime. A second speaker will discuss ways to protect your laboratory from a cyberattack.

Precision Metagenomic Testing: The Next Frontier  
12:45 p.m. – 1:30 p.m.  
TRACK HUB

The session will focus on current and future applications of clinical metagenomic testing beyond its use for multiplexed pathogen identification. Speakers will review the latest advances in the field that leverage metagenomics to allow point-of-care testing and antimicrobial resistance prediction on rapid nanopore sequencers, incorporation of a patient’s host / immune response to infection to aid in diagnosis, and differential diagnosis of cancer. Attendees will learn how metagenomic testing has the potential to become a key tool for precision medicine in microbiology by providing the capability of diagnosing non-infectious as well as infectious conditions. This session will also cover what will be needed for practical implementation of these state-of-the-art technologies in clinical microbiology laboratories.

Understanding the Function of Microbial Effector Proteins  
12:45 p.m. – 1:30 p.m.  
TRACK HUB

Pathogenic bacteria secrete effector proteins that hijack/manipulate host cell signaling events to promote pathogenesis. Many of these effectors can have redundant functions that make deciphering effector function difficult. Using Legionella pneumophila, which secretes over 300 effectors, as a model, Dr. Matthias Machner will describe innovative strategies - such as multiplex, randomized CRISPR interference sequencing (MuRCIS) and FRET-based high throughput screening - employed to delineate overlapping effector functions.

The Perks of Being Squishy: Archaea as a Skilful Mechanoresponsive Machine  
12:45 p.m. – 1:30 p.m.  
TRACK HUB

Microbes are often seen as the product of biochemical activities determined by a combination of gene pathways in response to environmental changes. However, little attention is given to how mechanical forces from the same environment determined how cells respond as active-matter entities. This session will cover how archaea, prokaryotic microbes that are closer to eukaryotes than bacteria, have compromised mechanical stability of a rigid cell wall to develop cell signaling. This session aims to highlight advancement in metabolomics methods and their application to microbial research to delineate mechanisms of microbe-microbe, and microbe-drug, microbe-host interactions.
WEDNESDAY, JUNE 14

ASM MICROBE 2024 has been designed to enter the periplasm siderophore-modified cephalosporin that by most beta-lactamases. Cefiderocol is a recently approved cephalosporin that has been reported as refractory to hydrolysis or inhibitors of resistance mechanisms, or lactam antibiotics, is a relevant threat to public health. Antimicrobial resistance, mainly to beta-lactam antibiotics, is a relevant threat to public health. New drugs, either new antibiotics or inhibitors of resistance mechanisms, are urgently required. Cefiderocol is a recently approved cephalosporin that has been reported as refractory to hydrolysis by most beta-lactamases. Cefiderocol is a siderophore-modified cephalosporin that has been designed to enter the periplasm of Gram-negative bacteria by exploiting a selective iron-transporter channel, resulting in higher concentrations of this antibiotic in the bacterial cell and consequently, excellent antibacterial activity. In addition, cefiderocol was reported to be refractory to the action of beta-lactamases, including the broad spectrum metallo-beta-lactamases such as NDM-1, IMP-1 and VIM-2. However, after its approval, an increasing number of resistance events to cefiderocol have been reported. Resistance has been related to mutations in the iron transporter in Enterobacterales and non-fermentors, but (more surprisingly) to the overexpression of beta-lactamases. The understanding of the interaction of different beta-lactamases is required to understand the occurring resistance phenomena and guide better therapies. This Symposium is aimed to link clinical and biochemical information, including different families of beta-lactamases, for a general audience.

Microbial Diversity: Empowering Disabled Scientists in Microbiology
12:45 p.m. – 1:30 p.m.
CAREER TALK

This session will act as an introduction to common challenges faced by disabled scientists and trainees and will provide practical strategies and best practice on how to effectively support disabled scientists. Attendees at every level will be encouraged to critically examine current standard practices in academia, and how they can act as barriers to the entry and retention of disabled learners. Actionable items for learners at different career stages (student, technician, post-doc, professor) will be presented, followed by the opportunity for a discussion on questions/concerns the learners have about the best strategies to address ableism in academia. After the session, learners will have the skills and initial exposure to acknowledge and challenge barriers faced by disabled individuals in microbiology, take action to combat ableism around them, and to create a more inclusive research environment that nurtures the potential of all scientists.

Interaction of Cefiderocol with Beta-Lactamases: Clinical and Biochemical Aspects
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Antimicrobial resistance, mainly to beta-lactam antibiotics, is a relevant threat to public health. New drugs, either new antibiotics or inhibitors of resistance mechanisms, are urgently required. Cefiderocol is a recently approved cephalosporin that has been reported as refractory to hydrolysis by most beta-lactamases. Cefiderocol is a siderophore-modified cephalosporin that has been designed to enter the periplasm of Gram-negative bacteria by exploiting a selective iron-transporter channel, resulting in higher concentrations of this antibiotic in the bacterial cell and consequently, excellent antibacterial activity. In addition, cefiderocol was reported to be refractory to the action of beta-lactamases, including the broad spectrum metallo-beta-lactamases such as NDM-1, IMP-1 and VIM-2. However, after its approval, an increasing number of resistance events to cefiderocol have been reported. Resistance has been related to mutations in the iron transporter in Enterobacterales and non-fermentors, but (more surprisingly) to the overexpression of beta-lactamases. The understanding of the interaction of different beta-lactamases is required to understand the occurring resistance phenomena and guide better therapies. This Symposium is aimed to link clinical and biochemical information, including different families of beta-lactamases, for a general audience.

Drug Discovery and Resistance Against NTM
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

The goal for the Session is to bring Scientist within the nation and other countries, to define the direction and identify critical knowledge gaps in inhibitors and resistance developed non-tuberculous mycobacterium. Our ultimate goal is to assemble a NTM research team with desirable expertise to design and optimize inhibitors targeting different pathways and study mechanisms of resistance in non-tuberculous mycobacteria.

If We Build It, They Will Colonize: the Resident Microbiome of Food Processing-built Environments
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Food processing environments are critical reservoirs of foodborne pathogens and spoilage microorganisms, yet the full scope of the microbes surviving in these locations has only recently begun to be investigated. This session will bring together researchers investigating a wide range of food processing environments, from fruit and produce to animal products. Researchers will present key findings in the core microbiomes of these locations, impacts of microbial controls on the microbial communities, and the impacts these microbes have on the final product; these will include investigations of the free-living microorganisms as well as those in biofilms, and the relationship between these two survival methods. The ultimate goal of this session is to provide a holistic picture of our current understanding of the microbial communities of these critical environments and to achieve a working consensus on the best methodologies for investigating them. This consensus will also generate recommendations for industrial and commercial food operations to improve food plant design and sanitation protocols to improve overall public health.

The Secret Life of Anaerobes
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Globally, most microbes are strict or facultative anaerobes, with unique metabolism that requires specialized techniques to study them. This session will feature speakers studying anaerobic processes in diverse microbes across the tree of life. Recent advances in culturing, in situ metabolism, genome engineering and computational modeling are allowing researchers to make exciting discoveries of how anaerobic microbes contribute to nutrient cycles, climate, and how they interact with agricultural and human hosts. Attendees will have the opportunity to learn about the state-of-the-art interdisciplinary techniques researchers are using to uncover the hidden yet essential biology of anaerobic microbes.
Susceptibility to infections in children is often distinct from adults, with increased susceptibility to certain infections and almost full tolerance to others. Age-based differences in infectious agents and severity are seen throughout pediatric age groups and require a nuanced understanding to address appropriate prevention, diagnosis, and treatment. Therefore, the practice of infectious diseases and clinical microbiology in pediatrics is different from that in adults, and it is important providers and laboratorians are aware of the unique features and needs of children to provide comprehensive infectious diseases care. Through illustrative cases and vignettes, and guided by evidence-based medicine, subject matter experts will describe the practice of clinical microbiology, infectious diseases, and vaccination in children so attendees can apply this information to their own practice.

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**Microbial Experimental Evolution**

1:45 p.m. – 3:45 p.m.

IN-DEPTH SYMPOSIUM

Microbial experimental evolution is a powerful approach for understanding the fundamental evolutionary processes that shape all life on Earth. This session will showcase the latest advancements in experimental microbial evolution to understand adaptation, antibiotic resistance, and evolution in natural populations. Leading researchers will present cutting-edge studies manipulating model microbial systems in the lab to elucidate the genetic and molecular mechanisms underlying evolution. Talks will cover experimental evolution of viruses, bacteria, and yeast under diverse selective pressures including growth in novel carbon sources, temperature stress, antibiotic exposure, and viral infection. Attendees will learn how microbial experimental evolution provides novel insight into evolutionary dynamics including parallelism, contingency, epistasis, pleiotropy, and genetic drift. Speakers will also discuss integrating experimental evolution with whole genome sequencing, proteomics, and RNA-sequencing to connect genotype with phenotype. This session is ideal for microbiologists, evolutionary biologists, geneticists, and infectious disease researchers interested in using experimental evolution as a tool. Attendees will gain an up-to-date understanding of the field of microbial experimental evolution.
experimental evolution, experimental design, and cutting-edge techniques. Talks will highlight innovative new selections, assays, and microbial model systems pushing the boundaries of experimental evolution. The speakers will also share empirical data and theoretical models generated using experimental evolution and describe how these insights can be extended to diverse topics including the evolution of new traits and functions, arms race dynamics, development of antibiotic resistance, experimental testing of evolutionary theory, and evolution in natural populations. Attendees will have the opportunity to connect directly with leaders in microbial experimental evolution, share ideas, and brainstorm new collaborations. We encourage all researchers interested in fundamental evolutionary processes and exploring the power of microbial experimental evolution to understand the forces shaping life on Earth to attend this exciting session.

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**Survival of the Stealthiest: Unraveling Bacterial Pathogen Within-Host Adaptation**

**IN-DEPTH SYMPOSIUM**

Many bacterial pathogens can form persistent infections, providing an infectious reservoir which allows for recrudescence and infection of new hosts. The molecular mechanisms and evolutionary dynamics driving persistence are still not well-understood yet hold key information for designing more effective clinical strategies. High-throughput sequencing methods have enabled the study of within-host evolution of persistent bacterial pathogens, revealing i) how bacterial species adapt to persist within a host and ii) testable hypotheses for the role this evolution plays in the host-pathogen relationship. This session will focus on emerging insights on this topic, including from analysis of data from human-cohort and experimental studies of persistent infections.

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**Molecular Assembly on the Bacterial Cell Envelope and Host-Pathogen Interactions**

**IN-DEPTH SYMPOSIUM**

A variety of bacterial cell surface components are assembled on the cell envelope by intricate molecular machines. Often vital for orchestrating pathogenesis, surface proteins and carbohydrate and protein polymers mediate adherence to and modulate host cells. This symposium aims to provide a much-needed platform to discuss major recent advances and remaining challenges, and wherever possible, integrate the common and novel themes of surface assembly and host-pathogen interactions mediated by these surface determinants in both single- and double-membrane bacteria.

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**Decoding Bacterial Behavior and Physiology with Artificial Intelligence**

**IN-DEPTH SYMPOSIUM**

This session provides an exploration at the intersection of microbiology and artificial intelligence (AI). Our speakers, Dr. Lingchong You and Dr. Paul Jensen, will showcase innovative AI applications to dissect the dynamics and metabolism of microbial communities. The insights acquired have substantial potential in the development of novel adaptive materials and the cultivation of under-studied bacteria. This session is a must-attend for those intrigued by the dynamic interplay of science and technology, specifically the transformative power of AI in deciphering bacterial behavior and physiology.

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**Molecular Mechanisms of Interactions Between Biofilm Bacteria and Their Hosts**

**IN-DEPTH SYMPOSIUM**

Microbes can live and thrive within multicellular communities, known as biofilms. Many of the pathways underlying biofilm formation have been well established, however the mechanisms that drive biofilm-associated interactions with host organisms is an emerging area. This symposium will feature some of the latest research examining the molecular underpinnings of biofilm-host interactions; dissecting the biomolecular pathways and pathways that determine how microbial multicellular lifestyles effect host interactions ranging from symbiotic to pathogenic.

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**Bench to Bedside: Challenging Clinical Cases - Part 2**

**PANEL DISCUSSION**

Following William Osler’s advice to ‘have no teaching without a patient for a text’, this cross-track symposium allows attendees to learn from a diverse array of challenging clinical cases. The diagnosis and management of four highly interesting and unusual patient cases will be presented by CPEP (or infectious diseases) fellows, with Q and A discussion facilitated by 2-3 experts in the field of public health, clinical microbiology and infectious diseases. This would be a cross-track symposium between CIV and CPHM, with cases and presenters identified via outreach to trainees and faculty. The session will offer trainees a chance to present their best cases, but we anticipate broad appeal of the session to an audience ranging from novice to expert.
## Saturday Schedule (continued)

### SATURDAY, JUNE 15

<table>
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<th>Time</th>
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| 4:00 p.m. – 4:45 p.m. | **Embracing Active Learning & Artificial intelligence in Microbiology Education**  
**CAREER TALK**  
Active Learning and Artificial intelligence (AI) in Microbiology Education can help to increase the students’ understanding of Microbes. Embracing new teaching modalities and using AI can help to increase student engagement in the Microbiology courses we teach with the goal of helping the students retain more of the subject matter for use in their future careers. Active learning can include case-based learning, game-based learning, problem-based learning, and team-based learning. AI can help with generating different types of active learning exercises or even have students interact with a chatbot in trying to learn more information about different aspects of Microbiology. AI can also be used to generate summative and formative questions for students to use throughout their Microbiology courses. |
| 4:00 p.m. – 4:45 p.m. | **Cannabis and Hop Latent Viroid: Who Will Survive?**  
**TRACK HUB**  
The hop latent viroid is destroying cannabis crops throughout North America. While previously found to cause disease in hops, it has moved on to another target, and it is a weed we may not want to kill. This session will present the host-pathogen interaction, spread, and current understanding of potential outcomes for growers. |
| 4:00 p.m. – 4:45 p.m. | **Host-Microbe Biology (HMB) Community Meet-Up**  
**TRACK HUB**  
Join the Host-Microbe Biology (HMB) community for a meet-up! Connect with colleagues to discuss topics relevant to your scientific track community. This event is moderated by the ASM Council on Microbial Sciences (COMS) HMB Community Leader and the ASM Microbe HMB Track Leader. |
| 4:00 p.m. – 4:45 p.m. | **How to Wrangle a Training Opportunity at NIAID**  
**TRACK HUB**  
An overview of all training opportunities within the NIAID, how to apply, and what the training environment looks like across different campuses. |
| 4:00 p.m. – 4:45 p.m. | **Profession of Microbiology (POM) Community Meet-Up**  
**TRACK HUB**  
Join the Profession of Microbiology (POM) community for a meet-up! Connect with colleagues to discuss topics relevant to your scientific track community. This event is moderated by the ASM Council on Microbial Sciences (COMS) POM Community Leader and the ASM Microbe POM Track Leader. |
Taking Aim at MDR Gram-negative Bacteria: Priority Pathogens, New Approaches, and New Drugs
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

The expansion of multi-drug resistant (MDR) Gram-negative pathogens poses a serious threat to global health. This session will begin by highlighting priority Gram-negative pathogens and difficult-to-treat infections. We will then explore exciting advances and new approaches in the search for the next generation of efficacious agents targeting Gram-negative pathogens.

Hot Topics in AES
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

This session will present talks from new and exciting submitted abstracts with a focus on early-career scientists. New methods, systems, and findings will be presented.

Multidisciplinary Approach to Clinical Trials
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Clinical trials are an essential component in drug applicability and utilization. The completion of clinical trials requires support from multiple disciplines to ensure successful completion for each participant. The goal of this session will be to showcase the importance of these components in Antimicrobial Agent discovery.

Genomic and Wastewater Epidemiology for Pathogen Surveillance
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

With the advent of Next Generation Sequencing, genomic epidemiology has become more accessible to track the spread of disease. The lessons from this field can be applied to wastewater-based epidemiology (WBE), a new field that has gained prominence with the advent of the SARS-CoV-2 pandemic. The predictive utility of WBE with covid outbreaks has increased interest in using WBE for detection and surveillance of additional human pathogens, antimicrobial resistance, and possibly even outbreaks of novel diseases. This session will discuss progress in sequencing applications for genomic and wastewater epidemiology and how this technology is developing.

Hiding in Plain Sight: Pathogens in Our Environment
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

The air we breathe, the water we jump into on a warm summer’s day, and the ground beneath us all contain pathogenic organisms. How do we determine which organisms are truly causing infection when recovered in the clinical microbiology lab? Which organisms should we be aware of and what are the risk factors associated with different environmental pathogens? What should we do to prepare for changes in endemicity of pathogens as our environment changes? In this session you will learn the answers to these questions and more as a multidisciplinary team of scientists comes together to discuss these important organisms.

Keeping Control and Preventing Infections: Hospital Epidemiology and Microbiology Col-Lab-Oration
8:15 a.m. – 10:15 a.m.
CROSS-TRACK PLENARY

Health care-associated infections (HAIs) can result in significant morbidity and mortality, and often place additional demands on already limited diagnostic and treatment resources. Furthermore, HAIs can incur financial penalties. Therefore, monitoring and preventing HAIs in the health care environment is essential for patient care and overall community health and is dependent on close interaction between clinical and public health microbiology laboratories and infection preventionists. Through real-world examples, subject matter experts will highlight how HAIs can be reduced and the benefits of collaboration between laboratories and infection preventionists to manage and prevent HAIs.
SUNDAY, JUNE 16

Malaria: A Disease We Can’t Afford to Ignore
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Malaria is a mosquito-borne disease that was once widespread in the United States. However, thanks to effective public health measures, malaria was largely eradicated from the US by the mid-20th century. For the first time in two decades, there have been several recent cases of locally transmitted malaria in the US, raising concerns about the potential for the disease to re-emerge. This session will discuss the history of malaria eradication in the US and its current state globally. It will also detail CDC’s investigation into the locally transmitted cases.

Climate Change and Microbial Ecology (Plenary)
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Microbes and their viruses are key players in climate homeostasis: they control greenhouse gas emissions, maintain terrestrial and marine ecology and biogeochemistry, enable plant and animal adaptation and survival, and contribute to crop productivity, among many other roles. Rapid climate change is altering microbial communities and their functions from molecular to ecosystem level, changing rates and fluxes in biogeochemical cycles and interactions between microbes and within host systems. This symposium will feature research across multiple spatiotemporal scales to explore how microbes and their viruses are affected by and are affecting climate change, and the possibility of using microbial ecology to mitigate climate change effects.

Hot Topics in EEB
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Research within the Ecology, Evolution and Biodiversity Track embodies a wide array of topics within the microbiological sciences. This session will highlight groundbreaking work from trainee submitted abstracts within and beyond the areas emphasized in our in-depth symposia programming.

Hot Topics in Host-Microbe Biology
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Research within the Host-Microbe Biology Track embodies a wide array of topics within the microbiological sciences. This session will highlight groundbreaking work from trainee submitted abstracts within and beyond the areas emphasized in our in-depth symposia programming.

Considerations for Microbiome-Based Therapeutic Success: Colonization and Context (Plenary)
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Microbiome-based therapies represent a new and emerging approach to treat a wide range of human diseases. Before such approaches can be broadly used in the clinics the parameters that define therapy success need to be defined. This session will shed light on the multiple factors (including transplant engraftment efficacy, host immune status, diet consideration, and commensal colonization resistance) that determine whether a microbiome-based therapy will be successful. This session will bring together speakers from the basic and clinical world to present findings on the latest advances in our understanding of how to successfully use microbiome-based therapeutics.

How to Survive a Phage Apocalypse (Plenary)
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

A primary driver of the evolution and ecology of bacteria is bacteriophage (phage) infection. The last few years have witnessed an explosion of our understanding in how bacteria defend themselves against phage. This session will explore the interaction of bacteria with their phage and how the diverse molecular mechanism by which bacteria defend against phage infection.

Human Leishmaniasis in the United States: Epidemiology, Diagnostic Strategies, and Treatment Updates
9:15 a.m. – 10:15 a.m.
PANEL DISCUSSION

The proposed session will include three speakers who will provide an overview of the epidemiology of human leishmaniasis in the United States, options for molecular and culture-based diagnostic testing, how precise taxonomic identification of the infecting parasite influences treatment decisions, and key challenges in the coming decade. Dr. Joshua Lieberman (University of Washington, convener) will introduce the audience to Leishmania epidemiology in the US based on published studies and 2.5 years of molecular testing data from a
Sunday Schedule (continued)

SUNDAY, JUNE 16

civilian molecular reference laboratory. He will highlight both advantages and taxonomic limitations of molecular diagnostic strategies. Dr. Sheila Peel (Walter Reed Army Institute of Research) will discuss how highly specific culture-based isoenzyme electrophoresis testing – the gold standard for species-rank identification – guides treatment decisions and the obstacles to obtaining/maintaining this testing in the United States. Dr. Naomi Aronson (Uniformed Services University of the Health Sciences) will close the session with an overview of near-future challenges for this disease in the US, including suboptimal treatment response rates and the need for new and/or combination therapies, disease threats to immunocompromised persons, and risks for increased autochthonous transmission in a changing climate.

Advancing Antibiotic Combination Strategies: Integrating PK/PD, Mechanistic Synergy, and Computational Models for Overcoming Resistance
10:45 a.m. – 11:30 a.m.
TRACK HUB

The purpose of the track hub is to educate the audience on the intricate interplay of antibiotic synergy, encompassing the integration of PK/PD profiles, mechanisms of synergy and resistance, and computation models, all vital for the development of optimized combinations therapy to combat antibiotic resistance.

Antimicrobial Resistance and Stewardship in Carceral Settings
10:45 a.m. – 11:30 a.m.
TRACK HUB

The session will provide perspectives on antimicrobial resistance within carceral settings and necessary stewardships interventions to optimize equitable outcomes.

Algae for Bioproduction: Extreme yields
10:45 a.m. – 11:30 a.m.
TRACK HUB

This session will present new work on using extreme algae to produce biofuels, which highlights novel means of bioproduction/bioconversion.

How to Initiate Industry Sponsored Studies in Your Clinical Laboratory
10:45 a.m. – 11:30 a.m.
TRACK HUB

Industry is in need of more clinical microbiology laboratories to be involved in registration studies (FDA clinical trials) to get new technologies in the hands of laboratory technicians for the advancement of patient care. Many clinical labs, however, lack the knowledge of how to get involved in studies and are unsure of the resources required to make this happen. They are also unaware of how participating in clinical trials can be beneficial for them. This discussion with give them insight on how and why to get involved in these trials.

What’s new in the Clinical Microbiology Procedures Handbook?
10:45 a.m. – 11:30 a.m.
TRACK HUB

This is an exciting time to be a clinical microbiologist! We are experiencing an explosion of new tools to support advances in microbiology testing, including phenotypic and genotypic assays. Laboratory methods are changing, and so are our patient populations. A new edition of the Clinical Microbiology Procedures Handbook has recently been published, with extensive revisions in all sections. This text is an SOP-based book to support clinical laboratories in providing evidence-based microbiology testing. The purpose of this session will be to highlight some of the major changes relevant to the practice of clinical microbiology, shared by Section Editors from the text.

How Far are We Towards Global Hepatitis Elimination in The Post-COVID Era?
10:45 a.m. – 11:30 a.m.
TRACK HUB

Viral hepatitis is a notorious disease with major global public health concerns, which is responsible for chronic infection in more than ~300 million people and more than 820,000 deaths per year worldwide. Acute viral hepatitis B and C may develop into chronic hepatitis, cirrhosis and liver cancer, which has ranked among the top 20 causes of death. Though there are safe and effective vaccines for prevention of hepatitis A and B, WHO estimates that there are more than 1.5 million new infections each year. Though there are oral antiviral agents for treatment of chronic hepatitis B and C, the currently available antivirals cannot eradicate the viruses from the chronically infected HBV individuals. Efforts to develop novel diagnostic markers and antiviral drugs are urgently needed. While a goal of global elimination of viral hepatitis by 2030 was set up by WHO in 2016, there are major gaps and challenges in research and practice, such as the lack of high-quality epidemiological data, and disparities in access to diagnostic testing with linkage to prevention and care and treatment services. This is especially true in the post-COVID era, in which the attention of the WHO and the world diverted by the pandemic is going back to the “old” and long-lasting public health problem, e.g., viral hepatitis. This session will review the impact of COVID-19 on diagnosis, treatment, and vaccination of viral hepatitis as well as the global hepatitis elimination plan. This session will also discuss new data and timely update which will be helpful for assessment of the status of different countries/regions towards global hepatitis elimination by 2030.
of leadership. Whether it wasn’t taught, or it just wasn’t applied to real life experience. Natural born leaders are naturally born to work on their leadership skills, anyone can become an effective leader with the right preparation for their individual needs. In this session you will hear how one PHD trainee went from medical microbiology fellowship trained to be a director to management and then into the role of director. You will hear of the different skill sets that would have been missed or taken many years more to learn had the management experience not been ascertained. You will learn how it is possible to prepare prior to management from someone who has learned following 5 years of management and now 3 years of directorship with a management team.

Training Under-represented Minorities to Become Super Scientists: Lessons From The HBCUs
10:45 a.m. – 11:30 a.m.
CAREER TALK

This session will allow for the audience to garner insights from the training of a critical mass of under-represented minority students at HBCUs. HBCUs are woefully under-resources yet are very successful at preparing students for advanced training in the areas of medicine, law, and science. There is a hunger amongst HBCU STEM majors to pursue excellence in STEM fields. Yet, under-exposure to science in minority communities inhibits the development of a proper perspective and mindset for a research career. Additionally, issues pertaining to science literacy and technology aversion create additional barriers for proper preparation of underrepresented minorities to obtain a thriving STEM career. We have discovered that creating a proper perspective on the role and value of science in society, as well as a systematic laboratory training plan can mitigate the abstraction associated with considering and preparing for a career in science. The learner should attend this session to see what it is that under-researches HBCUs do to train budding under-represented minority scientists that makes informative investments to broaden science participation in different institutions.

Antimicrobial Peptides Against Gram-negative Bacteria
12:45 p.m. – 1:30 p.m.
TRACK HUB

Antimicrobial peptides (AMPs) are small peptides that have antibacterial and/or anti-biofilm activity against bacteria. AMPs are part of the innate immune system and can also be synthetically designed. AMPs represent a potentially new type of antimicrobial agent against bacteria. In this session, we will focus on AMPs with activity against gram-negative bacteria, and especially against multi-drug resistant and biofilm forming bacteria.

Decoding Microbiomes: Mechanistic Insights via Metabolomics and Lipidomics
12:45 p.m. – 1:30 p.m.
TRACK HUB

Microbial communities play a central role in the health and functioning of various ecosystems- environmental and human associated. Comprehensive, systematic profiling of small molecules, including metabolites and lipids, in microbial communities can offer valuable insights into their functions, interactions, and responses to environmental conditions. This session focuses on how metabolomics and lipidomics are being leveraged to advance our understanding of microbial communities across ecosystems.

Creutzfeldt-Jakob Disease and Other Prion Diseases
12:45 p.m. – 1:30 p.m.
TRACK HUB

The role and value of neurodegenerative markers and real-time quaking induced conversion testing will be discussed.

One Thousand Genomes for Syphils
12:45 p.m. – 1:30 p.m.
TRACK HUB

This session will give an overview of insights gleaned from the first 1000 genomes of T. pallidum, and how sequencing is informing our understanding of evolution, public health response, and functional aspects of this mercurial pathogen.

Evolutionary Limits of Microbial Populations
12:45 p.m. – 1:30 p.m.
TRACK HUB

This track hub will focus on how interactions and the type of selection impact rates of evolution and the evolution of complexity.

Bacterial Lipids- Advances in Structural Analysis and Function using Mass Spectrometry
12:45 p.m. – 1:30 p.m.
TRACK HUB

Microbes contain a number of characteristic lipids and lipoproteins. These molecules are crucial not only for membrane integrity but also for signaling, responding to environmental stresses, propagation, antibiotic resistance, and pathogenesis. The characteristics, structure, and specific mechanisms leading to bacterial lipid synthesis and regulation represent long-standing questions requiring the latest technologies that improve the resolution of microbial lipidomics. Mass spectrometry has become a method of choice for meeting many of these challenges, thanks to advances in instrumentation, methodology, and the ability to directly analyze without the need for ex vivo growth.

Sunday Schedule (continued)
Malaria Diagnostics: Choosing the Right Tool
10:45 a.m. – 11:30 a.m.
TRACK HUB

Human malaria is caused by one of five plasmodium parasites, Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae, Plasmodium ovale, and Plasmodium knowlesi. Diagnosis of the infections requires detection of the blood stages of the parasite in infected persons. Malaria diagnosis is commonly done by smear microscopy, antigen-based rapid diagnostic tests (RDTs) but increasingly, also by multiple different molecular methods. The use of each of these tests requires careful consideration of whether they are for primary patient diagnosis, surveillance, or research. Additionally, tests may have performance characteristics and limitations that make them more appropriate in different epidemiologic settings or use cases, requiring specific capacities for implementation. This session will describe the various tests, best use cases, and considerations for use in specific settings.

Use of Spatial Transcriptomic Analysis and Machine Learning Approaches to Gain a Unified Map of Infection
10:45 a.m. – 11:30 a.m.
TRACK HUB

Genomic data from P. aeruginosa and E. coli clinical isolates were collected from the past 20 years and analyzed using comparative genomics to elucidate changes in the core genomes and frequencies of AMR acquisition. The analysis pointed to a staggering 100% increase in the appearance of AMR resistance traits in the clinical strains, tendencies that necessitate development of intervention strategies against ESKAPE pathogens. I will discuss comparative genomics and transcriptomics approaches to generate unified host-pathogen maps of infection which will lead to intervention opportunities. To gain insights into the pathogen behavior within the infected tissues, we developed spatial, pathogen-specific transcriptome profiling and found differential enrichment of pathogen-specific transcripts at distinct anatomical locations. By using machine learning approaches, we correlated pathogen transcriptional features to host responses and found interconnected circuits. Longitudinal spatial transcriptomic analysis uncovered temporal changes in pathogen behavior, consistent with the establishment of chronicity. Cumulatively, our data highlights coordinated spatial and temporal transcriptional interplay between the host and the pathogen that may pinpoint to druggable circuits.

Using Microfluidics to Probe the Inner Life of Bacteria
10:45 a.m. – 11:30 a.m.
TRACK HUB

Speakers will present about the types of microfluidic technology available to microbiologists and bacterial cell biologists and their applications. We will cover the types of questions that are particularly well suited to microfluidics and what questions can be more easily addressed with other approaches. We will honestly discuss the limitations and challenges of using microfluidics and how microfluidic technology can be made more accessible and user friendly. We will also present data gained using microfluidics and discuss data curation and presentation.

Who’s The Boss Here? How to Transition From Academia to Effective Leadership with (Some) Grace.
10:45 a.m. – 11:30 a.m.
TRACK HUB

The primary goal of academic training is to obtain a mastery of your skill and put it to work immediately following your achievement. This is typically demonstrated by obtaining that ideal position, securing funding or salary, and maybe even leading a team to accomplish key goals. However, one essential skill that tends to get missed in our training is the skill
Sunday Schedule (continued)

SUNDAY, JUNE 16

BamA: A Story of Antibiotic Discovery at Genentech
12:45 p.m. – 1:30 p.m.
TRACK HUB

This presentation aims to offer participants a comprehensive understanding of the drug discovery process from an industry perspective. Addressing antibiotic-resistant bacterial infections represents a critical worldwide issue. Gram-negative bacteria in particular are challenging because of the hurdle of penetrating both membranes. To overcome this hurdle we at Genentech concentrated efforts on an essential target in the outer membrane, BamA. This presentation will start with an introduction to challenges in Gram-negative antibiotic discovery, then share the steps of discovering a new drug target by using BamA as a case study. The talk will conclude with thoughts on the future of drug discovery and how to overcome barriers.

Top Ten Papers in Beta-lactamases
1:45 p.m. – 3:45 p.m.
PANEL DISCUSSION

This is an all-encompassing legacy session on the most prevalent enzymatic resistance mechanism present in Gram-negative bacteria: beta-lactamases. The top 10 papers published from July 2023-June 2024 in the field of beta-lactamases will be reviewed. This includes epidemiology of current and novel beta-lactamases, the clinical relevance of these beta-lactamases on treatment, including novel therapies, as well as studies on the biochemistry of beta-lactamases with beta-lactams and inhibitors and other aspects that impact activity of these important enzymes.

Support for International Post-Graduate Trainees in Healthcare Settings
12:45 p.m. – 1:30 p.m.
TRACK HUB

International medical graduates (IMGs) are vital to the US Healthcare system comprising about a quarter of the physician workforce and contributing to the diversity of the medical workforce in the United States, including in Microbiology, Public Health and Infectious Diseases. This session will review the challenges faced by IMGs and other international graduates participating in post-graduate training in US settings. The session will discuss actions that faculty, mentors and peers can take to better support international trainees in US healthcare and medical settings.

New Agents
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Antimicrobial Resistance is a growing global public health threat. Thus, there is an urgent need to develop and utilize novel therapeutics that are able to evade typical mechanisms of resistance.

Environmental Factors in Antimicrobial Resistance
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Infection control efforts have made progress in reducing healthcare-associated infections with antimicrobial resistant (AR) pathogens. However, environmental and community transmission of AR pathogens and antimicrobial resistance genes has proven more difficult to combat. This session seeks to present recent progress in understanding environmental sources and sinks of AR genes and AR pathogens, including the role of wastewater conveyance and treatment infrastructure in mediating human-environment exchange of AR genes and AR bacteria. In addition, we are exploring the role of the human commensal microbiome as a potential mediator of bacterial and gene exchange between humans and the environment. Together, these topics are key to understanding the emergence and persistence of AR genes and AR pathogens.

Plant Microbiomes for Sustainable Agriculture
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Plants are hosts to a vast diversity of microbes that comprise plant microbiomes. Plant microbiomes influence host gene expression, metabolism, and health. This in-depth symposium will highlight research in plant microbiology, plant microbiomes, and plant-microbe interactions in relation to sustainable agriculture. Attendees will learn about the functions of plant microbiomes while networking with other researchers to foster and strengthen collaborations between diverse research groups across sectors. Having an in-depth symposium on plant microbiology and its relation to sustainable agriculture will increase participation from researchers in this area.
In this session, we will discuss the advances and challenges in the laboratory diagnosis of pediatric viral CNS infections due to emerging and/or re-emerging neurotropic viruses. We will also analyze unmet needs in this field and discuss future directions towards optimization of the laboratory diagnosis of pediatric CNS infections due to these viruses.

Hot off the Bench: Research from Trainees in Clinical Microbiology
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

One of the primary reasons to attend ASM Microbe is to gain knowledge on state-of-the-art diagnostic methods for the clinical laboratory. Trainees in clinical microbiology, such as CPEP fellows, are frequently the individuals conducting this state-of-the-art research. This research may be focused on a number of topics, such as laboratory process improvement, evaluation of new diagnostic methods, or investigation of the epidemiology or virulence of pathogenic microbes that infect humans. This is a fast-paced session where outstanding abstracts from trainees, representing high quality work relevant to clinical microbiology will be presented. This session will provide trainees with a wonderful opportunity to network and celebrate their work, and it benefits ASM Membership to hear about the advances in the field being developed by these trainees.

Little Things Cause Big Trouble in Developing Brains: Emerging and Re-merging Viral CNS Infections in Children
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Recent decades have witnessed the emergence and re-emergence of numerous medically important viral pathogens that can cause CNS infections in children, including Zika virus, West Nile virus, enteroviruses and human parechoviruses. Viral invasion into CNS, especially in neonates, can cause meningitis, encephalitis, and long-term neurodevelopmental sequelae. Rapid and accurate detection of these viruses from CSF is essential for diagnosis of CNS diseases and for preventing inappropriate and costly treatments. Conventional microbiology/virology methods play an important role in routine diagnosis of CNS infections. Multiplex meningitis/encephalitis panels and metagenomic next-generation sequencing assays for pan-pathogen detection have been demonstrated as useful additions to a suite of molecular assays for detection of viral pathogens in CSF. However, there are still a variety of challenges in implementation, utilization and interpretation of these assays in clinical settings. In this session, we will discuss the advances and challenges in the laboratory diagnosis of pediatric viral CNS infections due to emerging and/or re-emerging neurotropic viruses. We will also analyze unmet needs in this field and discuss future directions towards optimization of the laboratory diagnosis of pediatric CNS infections due to these viruses.

Cyanobacteria in Marine and Terrestrial Systems: From Genomes to Biocrusts to Blooms
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Cyanobacterial biocrusts fix carbon and nitrogen and stabilize surfaces of drylands, which account for more than 40% of Earth’s continental area. Biocrusts make dryland systems more resilient to global change, but every minute, up to 23 hectares of vegetated land are subject to desertification. Biocrust coverage is predicted to decline by 25-40% within 60 years, and efforts of biocrust restoration by cyanobacterial inoculation of newly desertified lands are underway. Characterization of biocrusts leads to discovery of new cyanobacterial species and functions to expand our understanding for biocrust restoration.

Drivers, Constraints and Consequences of Microbial Recombination
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Genetic recombination allows a microbial cell to acquire novel traits through incorporation of DNA fragments from other organisms into its own genome. The consequences of recombination within and between species
are vast. This session will highlight current work and new insights on how various mechanisms of microbial recombination influence standing diversity, niche expansion, emergence and spread of unique phenotypes, rapid adaptive changes, and the nature of speciation and species boundaries. Emphasis will also be placed on the ecological, mechanistic, and adaptive barriers to recombination and how these are overcome.

**Integrating in Silico Models in Host-Microbe Biology**
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Systems biology approaches are becoming widely used to better understand microbes in their environments. Genome-scale modeling of microbial physiology and metabolism is one such approach, but to date its application to host-microbe interaction studies has been limited. This in-depth symposium will bring together systems biologists and host-microbe biology experts to showcase how in silico models can reveal new biology about microbes in their host environments. In doing so, this symposium will enable learners from all areas of microbiology and systems biology to gain perspective on this interdisciplinary area of research.

**Single Cell Contributions to Host-associated Microbial Community Dynamics**
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

Traditional approaches towards the study of host-pathogen interactions are, by necessity, targeted at the "bulk-level" microbial population. As a result, contributions of individual community members (i.e., single cells) to pathogenesis and how they respond to antimicrobial therapy can be masked by the emergent properties of our complex microbiota. This symposium will highlight novel, high-throughput, and much-needed approaches towards the study of the structural and functional heterogeneity of our microbiota at the level of individual cell, and how a deeper understanding of microbial states in vivo can be exploited therapeutically.

**Regulatory RNAs in Bacteria: Prevalent and Relevant**
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

RNA-mediated regulation allows bacteria to quickly adapt to environmental stress conditions, finetune the expression of many different genes, and are critical for pathogenesis. Regulatory RNAs are diverse, both in modes of their biogenesis and action. Broadly, these regulators have been classified into cis- or trans-acting. Cis-acting RNAs are encoded in the 5' untranslated regions (UTRs) of mRNAs and regulate downstream gene expression by altering RNA secondary structure, often by binding metabolic byproducts (riboswitches) or temperature changes (RNA thermometers). Trans-acting RNAs are typically small (less than 300 nt) and base pair with target RNAs to elicit a regulatory effect. This in-depth symposium will highlight new discoveries in bacterial regulatory RNAs and their intricate regulatory mechanisms.

**A Coordinated Effort: The Dynamic Inner Lives of Bacterial Cells**
1:45 p.m. – 3:45 p.m.
IN-DEPTH SYMPOSIUM

The bacterial cell was once considered to be a bag of enzymes devoid of order or organization. Decades of work have challenged this notion, revealing that subcellular organization governs a myriad of fundamental processes in bacteria, including cell division, metabolism, and stress responses. With our speakers we will examine how bacteria coordinate multiple subcellular machines to divide, to sporulate, and to respond to their environment. This session will continue to unravel the "bag of enzymes" hypothesis, featuring exciting new discoveries in bacterial cell shape and organization.

**Shifting Industries: Alternative Careers for Clinical Microbiologists**
3:15 p.m. – 4:15 p.m.
PANEL DISCUSSION

This session will explore the role of clinical and public health expertise within the in vitro diagnostics industry and the importance of scientific collaboration between the clinical, public health, and industry sectors. Experts from clinical microbiology, public health, and industry will discuss considerations and unexpected obstacles of career choices outside the laboratory and the value of microbiology expertise within these roles. Additionally, this session will highlight the role of medical and scientific affairs and how clinical microbiologists in industry can help drive innovation. Finally, public health and in-vitro diagnostic industry collaboration opportunities will be discussed.
Challenges in MIC testing of new drugs: Stories from a Public Health Laboratory
4:00 - 5:00 p.m.

**MEET-THE-EXPERT**

This session will take a case-based approach on understanding the limitations of testing new antimicrobial agents for bacterial isolates. It will provide guidance on validation and verification used for establishing methods for MIC testing on newly approved antibiotics that most clinical laboratories do not routinely test for.

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AES Meet the Editor
4:15 p.m. – 5:15 p.m.

**MEET-THE-EXPERT**

Attendees will hear updates on new initiatives from ASM publishing and have the chance to interact with ASM journal editors.

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The Exciting World of Toxin-Antitoxin Systems
4:15 p.m. – 5:15 p.m.

**MEET-THE-EXPERT**

Toxin-Antitoxin (TA) systems are ubiquitous genetic modules found in bacteria and archaea, consisting of a toxin that inhibits cell growth and an antitoxin that neutralizes its effects. These systems play crucial roles in stress response, plasmid stabilization, and persistence mechanisms. More recently, roles for TA systems have been identified in promoting bacterial pathogenesis and in phage defense. Combined with the discovery of novel TA systems in previously "dark"/unknown portions of bacterial and archaeal genomes, understanding the precise biological functions of TA systems and their regulatory mechanisms remains a significant challenge.

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Swimming in the Time of Cholera: Flagellar Synthesis in *Vibrio cholerae*
4:15 p.m. – 5:15 a.m.

**MEET-THE-EXPERT**

Many bacteria produce flagella that allow them to swim, and motility is typically intimately associated with their lifestyle. Vibrio cholerae, the bacteria that cause the life-threatening disease cholera, produce a single flagellum that allows them to swim. V. cholerae motility is associated with their ability to cause disease, as well as their ability to form biofilms in the marine environment. How V. cholerae (and other Vibrios) build a flagellum and how this appendage relates to their ability to cause disease and persist in the environment will be discussed.
Monday Schedule

MONDAY, JUNE 17

Advancements in Antibody-Based Therapies Against Multidrug Resistant Pathogens
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

This session will be focused on the development and eventual utilization of vaccines against multidrug resistant pathogens, including non-fermenting organisms.

New Insights into Molecular Mechanisms of AMR
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Elucidation of the molecular mechanisms of antimicrobial resistance (AMR) is important for fundamental/basic understanding of this phenomenon, tracking and surveillance of resistance determinants, understanding of the liabilities of antimicrobials in terms of resistance, and discovery of new antimicrobials. In recent years, important advances have been made in the elucidation of the action of multiple classes of AMR proteins, including the ribosome-acting ABC-F family and 16S methyltransferase family of proteins, and anti-folate resistance proteins. In this symposium, speakers will discuss their work on discovery and characterization of each platform relative to the others. Knowledge of the advantages and limitations of the session the attendees should have.

Harnessing Microbes for Sustainability in Mining
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

The mining industry is facing unique challenges that require creative solutions. Renewed focus on mitigating global climate change is increasing pressure for “green” energy and driving market demand for the raw materials needed to provide products such as steel and batteries. Concurrently, societal, and regulatory pressures for providing these raw materials with less environmental impact than conventional methods are at an all-time high. As the rate of advance of chemical and physical technologies wanes, biology is emerging as the new frontier for solutions in the mining industry. In this session, we will explore the potential for microbiology to mitigate waste and create value in mining applications ranging from metal recovery to impurity removal to bioleaching to carbon dioxide sequestration.

Diagnostic Parasitology: Best Practices and Future Directions
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Diagnostic parasitology is a critically important part of the clinical microbiology laboratory. Many laboratories have conceded to relegating this testing menu to regional or national reference labs, especially after experiencing staffing losses post-COVID. An unfortunate result of these realities is collectively: decreasing visibility and expertise in parasitology, a drift toward decreased knowledge and errors, lack of understanding of best practices, and decreasing general awareness of parasitic diseases. This session will take a deep dive into notable parasitic diseases in the United States and beyond, with a focus on best practices, common mistakes made by non-experts, and future advancements and modifications that can help more labs to reengage with the fine art of parasite detection. Specific areas of focus will be gastrointestinal parasites, blood parasites, gross helminths and arthropods. New and underutilized technologies will be discussed such as multiplex NAAT testing, sequencing, histopathologic identification, and artificial intelligence/machine learning using image analysis.

Immune Responses to Viral Vaccine Platforms: Comparison of Live, mRNA, and Protein Subunit Vaccines
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Recent events have placed a spotlight on viral vaccines and the various platforms used. This session will provide an in-depth analysis of the humoral and cell-mediated immune responses, the durability of the immune responses, and the potential immune correlates of protection elicited by each vaccine platform. At the conclusion of the session the attendees should have knowledge of the advantages and limitations of each platform relative to the others.

Microbial Nutrient encryption (Plenary)
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Encryption makes information available only to those with the decoding key. Microbes, living in a chemical environment, encrypt nutrients, thereby making them available only to those with the decoding enzymes, such
as their kin. Examples of encrypted nutrients include cobamides, which are expensive to make and valuable for microbial fitness. Hosts also encrypt nutrients to encourage desirable colonizers. For instance, plant root exudates and breast milk oligosaccharides encourage beneficial microbes. This session will explore different examples of nutrient encryption in microbial communities and host contexts.

Our Microbial Organ: Impact of Microbiota Metabolites in Host Health
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Our microbial organ, the gut microbiota, plays a critical role in supporting host health. This session will shed light into how microbiota-derived metabolites affect host immune status, early-life development, and commensal colonization resistance against enteric pathogens. Additionally, the session will focus on factors that may determine whether a microbiome-based therapy will be successful.

Welcome to The Jungle: Microbial Interactions in Polymicrobial Communities (Plenary)
8:15 a.m. – 10:15 a.m.
IN-DEPTH SYMPOSIUM

Many bacteria live in dynamic polymicrobial communities. For example, chronic infections are often co-infected with multiple species of bacteria or several lineages that emerged from a single infecting strain. This session will explore how microbial population heterogeneity impacts bacterial physiology and community functions and describe novel approaches to study these communities.

Local Insight, Global Impact: Collaborative Strategies for Clinical Microbiology Laboratory Capacity Building in Resource-Limited Settings
9:15 a.m. – 10:15 a.m.
PANEL DISCUSSION

Explore the intersection of local wisdom and international cooperation in ‘Local Insight, Global Impact: Collaborative Strategies for Laboratory Capacity Building in Resource-Limited Settings.’ This session assembles a panel of three distinguished speakers: Thomas Vidal, a Médecins Sans Frontières field implementer of the Mini-Lab program; Dr. Rachel Idowu, the US Centers for Disease Control Country Director for Liberia; and Wes Kim, Director, Global Public Health Programs for ASM’s involvement in global health laboratory capacity development. The discussion will focus on two main themes: identifying the challenges and gaps in resource-limited settings and exploring both existing and needed solutions. Key aspects to be discussed include best practices for capacity building and training and inclusion of local stakeholders, ethical considerations, promotion of interdisciplinary collaboration, and strategies for funding and sustainability. The session will conclude with a Q&A segment, offering attendees the opportunity to engage directly with the panel on these vital issues.

Beyond Academia: Fulfilling Microbiology Careers Outside the Tenure Track
10:30 a.m. – 12:00 p.m.
IN-DEPTH SYMPOSIUM

It’s estimated that 10-30% of PhD recipients will get a permanent position in academia. Often described as “alternative tracks,” sectors outside of the tenure track model are where the large majority of graduates make their careers. Despite this, many programs do not have sufficient knowledge or training for these jobs. Our panelists will discuss their paths to success outside academia, and the knowledge and skills they use that aren’t always emphasized in academic training.