



Final Program with Abstracts

**ASM Conference on Innovative Microbial Ecology for
Mitigation of Antibiotic Resistance and Bacterial Diseases**

March 22–25, 2017 | Crystal City, VA

© 2017 American Society for Microbiology
1752 N Street, N.W.
Washington, DC 20036-2904
Phone: 202-737-3600
World Wide Web: www.asm.org

All Rights Reserved
Printed in the United States of America



Table of Contents

ASM Conferences Information.....	2
Conference Organization	3
Acknowledgments.....	3
General Information.....	4
Travel Grants.....	5
Scientific Program.....	6
Speaker Abstracts.....	13
Poster Abstracts.....	36
Index	58

ASM Conferences Committee

***Joanna Goldberg, Chair**

Emory University

Theodore White, Vice Chair

University of Missouri – Kansas City

Victor DiRita

Michigan State University

Andrew Goodman

Yale University

Petra Levin

Washington University in Saint Louis

Susana Lopez

Instituto de Biotecnologia/UNAM

Gary Procop

Cleveland Clinic

Curtis Suttle

University of British Columbia

**Indicates Committee Liaison for this Conference*

ASM Conferences Mission

To identify emerging or underrepresented topics of broad scientific significance.

To facilitate interactive exchange in meetings of 100 to 500 people.

To encourage student and postdoctoral participation.

To recruit individuals in disciplines not already involved in ASM to ASM membership.

To foster interdisciplinary and international exchange and collaboration with other scientific organizations.

Program Committee

Hua Wang, Conference Chair, Professor,
Food Microbiology, The Ohio State
University, Columbus, OH

Michael Sadowsky, Conference Vice
Chair, Director, BioTechnology Institute;
Professor, University of Minnesota, Saint
Paul, MN

Pina Fratamico, Research Leader,
Molecular Characterization of Foodborne
Pathogens Research Unit, USDA-ARS-
ERRC, Wyndmoor, PA

David Hooper, Professor, Infectious
Diseases, Harvard Medical School,
Boston, MA

Matthew Parsek, Professor, Microbiology,
University of Washington, Seattle, WA

Louis B. Rice, Professor and Chair,
Medicine, Brown University, Providence,
RI

Qijing Zhang, Professor, Veterinary
Preventive Medicine, Iowa State
University, Ames, IA

Acknowledgments

The Conference Program Committee and the American Society for Microbiology acknowledge the following for their support of the ASM Conference on Innovative Microbial Ecology for Mitigation of Antibiotic Resistance and Bacterial Diseases. On behalf of our leadership and members, we thank them for their financial support:

Gold Supporters

Iowa State University

University of Minnesota BioTechnology Institute

Silver Supporters

GII – Global Innovation Initiative

Illumina

General Information

REGISTRATION AND NAME BADGES

ASM Staff will be available at the registration desk outside the Arlington Ballroom at the Crystal Gateway Marriott during posted registration hours. Participants may collect name badges and program materials at the registration desk. A name badge is required for entry into all sessions and meals.

GENERAL SESSIONS

All general sessions will be held in the Arlington Ballroom Salons V-VI at the Crystal Gateway Marriott.

POSTER SESSIONS

Poster boards are located in Arlington Ballroom Salon IV at the Crystal Gateway Marriott.

Posters will be available for viewing informally throughout the conference, with official poster sessions scheduled on Thursday and Friday.

All posters may be mounted starting on Wednesday after 4:00 pm, and should be available to view by no later than 10:00 am Thursday morning. Posters are to be removed after 7:00 pm on Friday, but by no later than 1:00 pm on Saturday. Posters not removed may be discarded.

Odd-numbered posters (1,3,5...) will be officially presented in Session A on Thursday, March 23, and even-numbered posters (2,4,6...) will be officially presented in Session B on Friday, March 24.

Please check your assigned number in the abstract index. The same number is used for the presentation and board number.

NETWORKING MEALS AND SOCIAL EVENTS

Registration includes attendance at the Welcome Reception on Wednesday evening and Networking Lunches on Thursday and Friday. Ample time has also been scheduled for participants to network during coffee breaks.

CERTIFICATE OF ATTENDANCE

Participants will receive an email after the conference with instructions to download and print a certificate of attendance. Your badge number will be required to access your certificate.

Note: Certificates of Attendance do not list session information.

CAMERAS AND RECORDINGS POLICY

Taking photographs or video of projected images in the session room with any device is prohibited. Photographs of posters are only allowed after receiving the presenter's permission. Report any violations to a member of the ASM staff.

CHILD POLICY

Children are not permitted in session rooms, poster sessions, conference meals or social events. Please contact the hotel concierge to arrange for babysitting services in your hotel room.

Travel Grants

ASM STUDENT AND POSTDOCTORAL FELLOW TRAVEL GRANTS

ASM encourages the participation of graduate students and new postdocs at ASM Conferences. To support the cost of attending the conference, ASM has awarded travel grants of \$500 to each of the following individuals:

Beth Adamowicz	Giselle Kristi Guron	Nicole Ricker
Gustavo Arango-Argoty	Yu Li	Yike Shen
Sara Constantine	Jian Hua Liu	Samendra Sherchan
Emily Garner	Shumaila Malik	Windy Tanner
Kathryn Geldart	Erin Olsan	

Scientific Program

Wednesday, March 22, 2017

5:00 pm – 6:00 pm **Keynote Session**

Arlington Ballroom

Salons V-VI

Welcome Remarks

Stefano Bertuzzi (CEO, ASM)

Hua Wang (chair), Mike Sadowsky (co-chair)

5:15-6:00 pm

Antibiotic Resistance and Mitigation: The Path to Where We Are Today

David Hooper, *Harvard University Medical School, Boston, MA*

6:00 – 7:30 pm

Arlington Ballroom

Foyer

Welcome Reception

Thursday, March 23, 2017

8:30 am – 12:40 pm

Arlington Ballroom

Salons V-VI

Session 1: Antibiotic Resistance: A New Comprehensive Picture

Chairs: David Hooper, Louis Rice

8:30 – 9:00 am

Burdens in Hospitals and Clinics

Louis Rice, *Brown University, Providence, RI*

9:00 – 9:30 am

Antibiotic Resistance and Modern Diseases: What Do We Know and Don't Know

Hua Wang, *The Ohio State University, Columbus, OH*

9:30 – 10:00 am

Treatment of Microbial Diseases without Antibiotics using Microbiota Transplantation Technologies

Michael Sadowsky, *University of Minnesota, Minneapolis, MN*

10:00 – 10:30 am

Understanding Antibiotic resistance in Different microbial ecosystems

Jack Gilbert, *University of Chicago, Chicago, IL*

10:30 – 11:00 am	Coffee Break
11:00 – 11:20 am	Impact of Raised Without Antibiotics Practices on Occurrence of Antimicrobial Resistance John Schmidt , <i>US Meat Animal Research Center, USDA-ARS, Clay Center, NE</i>
11:20 – 11:40 am	Toward Antibiotic Stewardship: Evaluating the Impact of Route of Antibiotic Administration on the Swine Gut Microbiota and Resistance Gene Discovery Nicole Ricker , <i>USDA-ARS National Animal Disease Center, Ames, IA</i>
11:40 am – 12:00 pm	Antimicrobial Resistance in <i>Enterococcus faecium</i> Isolated from Commercial Probiotic Products Used in Cattle and Swine Raghavendra Amachawadi , <i>Kansas State University, Manhattan, KS</i>
12:00 – 12:20 pm	Ecology and Regulation of Beta-lactamase Genes Jun Lin , <i>The University of Tennessee, Knoxville, TN</i>
12:20 – 12:40 pm	Global Ecology of Antimicrobial Resistance and Infectious Agents Sünje J. Pamp , <i>Technical University of Denmark, Lyngby, Denmark</i>
12:40 pm – 2:00 pm Arlington Ballroom Salon IV	Lunch
2:00 pm – 5:30 pm Arlington Ballroom Salons V-VI	Session 2: Impact of Mitigation Strategies on Bacterial Disease Prevention and Treatment <i>Chairs: Gary Dunny, Clayton Huntley</i>
2:00 – 2:30 pm	Transmission of MRSA Marilyn Roberts , <i>University of Washington, Seattle, WA</i>
2:30 – 2:50 pm	An Oral Therapeutic to Protect the Gut Microbiome from Antibiotic-mediated Damage Also Reduces Antibiotic Resistance Propagation in a Porcine Model Sheila Connelly , <i>Synthetic Biologics, Inc., Rockville, MD</i>

2:50 – 3:10 pm	Fecal Microbiota Transplantation (FMT) for Intestinal Decolonization of Multidrug-resistant, Opportunistic Pathogens <i>Ameé Manges, University of British Columbia, Vancouver, BC, Canada</i>
3:10 – 3:30 pm	The Curious Case of Antibiotic Resistance in <i>Liberibacter crescens</i> <i>Eric Triplett, University of Florida, Gainesville, FL</i>
3:30 – 4:00 pm	Coffee Break
4:00 – 4:30 pm	Biofilms and Cystic Fibrosis <i>Matt Parsek, University of Washington, Seattle, WA</i>
4:30 – 4:50 pm	Antimicrobial Probiotics Eliminate Salmonella in Poultry <i>Yiannis Kaznessis, University of Minnesota, Minneapolis, MN</i>
4:50 – 5:10 pm	Distribution and Diversity of Antibiotic Resistance Genes in Ecosystems with Different Anthropogenic Disturbances <i>Sanghoon Kang, Baylor University, Waco, TX</i>
5:10 – 5:30 pm	Development and Characterization of a Phage Therapy to Decolonize Vancomycin-Resistant Enterococci <i>Alyxandria Schubert, U.S. Food and Drug Administration, Silver Spring, MD</i>
5:30 – 7:00 pm Arlington Ballroom Salon IV	Poster Session A

Friday, March 24, 2017

8:30 am – 12:30 pm Arlington Ballroom Salons V-VI	Session 3: AR Ecology and Mitigation (I) <i>Chairs: Pina Fratamico, Hua Wang</i>
8:30 – 9:00 am	Assessing Microbiomes in Complex Ecosystems Rita Colwell , <i>University of Maryland, College Park, MD</i>
9:30 – 9:50 am	Distribution of Antibiotic Resistance Genes in Surface and Overhead Irrigated Greenhouse Lettuce Yike Shen , <i>Michigan State University, East Lansing, MI</i>
9:50 – 10:10 am	Metagenomic Analyses Reveal Co-presence of Antibiotic Resistance Genes, Mobile Genetic Elements, and Multiple <i>Enterobacteriaceae</i> Species in Select Coliform-positive U.S. Drinking Water Samples Windy Tanner , <i>University of Utah, Salt Lake City, UT</i>
10:10 – 10:30 am	Elucidating Antibiotic Resistance Gene Dynamics Along a Wastewater, Soil, Crop Continuum Eddie Cytryn , <i>Institute of Soil, Water and Environmental Sciences, The Volcani Center, Rishon Lezion, Israel</i>
10:30 – 11:00 am	Coffee Break
11:00 – 11:30 am	Transcriptional Landscaping with sub-MIC Concentrations of a Chemosensitizer- exploring Mechanisms to Reverse Antimicrobial Resistance Shea Fanning , <i>UCD-Centre for Food Safety, University College Dublin, Dublin, Ireland</i>
11:30 – 11:50 am	Characterizing the Communities Found From Radishes Grown in Manure-based Soil Amendments From Cattle Administered Antibiotics Giselle Guron , <i>Virginia Tech, Blacksburg, VA</i>
11:50 – 12:10 pm	Investigating the Role of Wastewater Treatment Plants on the Dissemination of Antibiotic Resistance Maria Riquelme , <i>Virginia Tech, Blacksburg, VA</i>

12:10 – 12:30 pm	Antimicrobial Resistance Arising from Food-animal Production and Its Mitigation <i>Zhongtang Yu, The Ohio State University, Columbus, OH</i>
12:30 – 2:00 pm	Lunch
Arlington Ballroom Salon IV	
2:00 pm – 5:30 pm	Session 4: AR Ecology and Mitigation (II) <i>Chairs: Mike Sadowsky, Qijing Zhang</i>
Arlington Ballroom Salons V-VI	
2:00 – 2:30 pm	Experimental Systems to Distinguish Enterococcal Colonization, Gene Transfer, and Cell-Cell Signaling Phenotypes from Antibiotic Resistance <i>Gary Dunny, University of Minnesota, Minneapolis, MN</i>
2:30 – 2:50 pm	Replacement of Antibiotics in Poultry Production to Mitigate the Antibiotic Resistance <i>Debabrata Biswas, University of Maryland, College Park, MD</i>
2:50 – 3:10 pm	Broad <i>in vitro</i> Inhibition of Food-borne Pathogens, Antimicrobial Resistant and Spoilage Bacteria by <i>Marinilactibacillus psychrotolerans</i> Isolated From Cheese Smear <i>Joerg Hummerjohann, Agroscope, Bern, Switzerland</i>
3:10 – 3:30 pm	Metagenome Investigation of Environmental Resistome Using Hiseq 4000 <i>Tatsuya Unno, Jeju National University, Jeju-si, Jeju-do, Republic of Korea</i>
3:30 – 4:00 pm	Coffee Break
4:00 – 4:30 pm	Emerging Multidrug Resistance Mechanisms in Foodborne Pathogens <i>Qijing Zhang, Iowa State University, Ames, IA</i>
4:30 – 4:50 pm	Spread of <i>mcr-1</i> via IncHI2, IncX4, and Inc12 Plasmids in the Pig Farm Where It Was First Isolated <i>Jian Liu, South China Agricultural University, Guangzhou, China</i>

4:50 – 5:10 pm	The Pandemic <i>H30</i> Subclone of Sequence Type 131 (ST131) Is the Leading Cause of Multidrug-Resistant <i>Escherichia coli</i> Infections in the United States (2011-2012) James Johnson , Minneapolis VA Medical Center, St. Paul, MN
5:10 – 5:30 pm	Providing Context: Antimicrobial Resistance From Multiple Environmental Sources Terrance Arthur , USDA-ARS-USMARC, Clay Center, NE
5:30 pm – 7:00 pm Arlington Ballroom Salon IV	Poster Session B

Saturday, March 25, 2017

8:30 am – 12:30 pm Arlington Ballroom Salons V-VI	Session 5: Improving Drugs, Methods, Practices and Global Collaboration <i>Chairs: Mike Sadowsky, Qijing Zhang</i>
8:30 – 9:00 am	Drug Discovery Mark Hamann , Medical University of South Carolina, Charleston, SC
9:00 – 9:20 am	Machine Learning-based Antimicrobial Resistance Prediction in PATRIC and RAST James Davis , Argonne National Laboratory and Univ. of Chicago, Argonne, IL
9:20 – 9:40 am	A Deep Learning-based Approach to Predict Antibiotic Resistance From Genes and Short Sequence Reads Gustavo Arango-Argoty , Virginia Tech, Blacksburg, VA
9:40 – 10:10 am	NIH Programs Clayton Huntley , NIAID, National Institutes of Health, Rockville, MD
10:10 – 10:40 am	Coffee Break

SCIENTIFIC PROGRAM

10:40 – 11:10 am	Developing Microbiome Indices to Accelerate Solutions for Antibiotic Resistance and <i>Clostridium difficile</i> Infection Clifford McDonald , Centers for Disease Control and Prevention, Atlanta, Georgia
11:10 – 11:30 am	Transforming the National Surveillance Platform by Integrating Innovation in Science Patrick McDermott , FDA/NARMS, College Park, MD
11:30 – 11:50 am	Theoretical and Applied Aspects of <i>Bdellovibrio</i> and Like Organisms Bacterial Predators as a Novel Tool Against Bacterial Pathogens Edouard Jurkevitch , The Hebrew University of Jerusalem, Rehovot, Israel
11:50 – 12:20 pm	Building the AR Stewardship Program with Cutting-edge Scientific Content Keith Kaye , University of Michigan, Ann Arbor, MI
12:20 – 12:30 pm	Concluding Remarks The Program Committee