



Pioneer Valley Microbiology Symposium 2022

Are you a Valley Microbe?

Program

March 5th, 2022

- 9:00 - 9:30 a.m.** **Registration and Coffee**
- 9:30 - 9:35 a.m.** **Opening Remarks:** James F. Holden, Professor and Dept. Head, Microbiology, UMASS Amherst
- 9:35 - 9:55 a.m.** **Celebrating Lynn Margulis** on her 84th birthday with Hummingbird Films and Emily Case
- 9:55 - 11:05 a.m.** **Session 1**
- 9:55 - 10:25 a.m.** *Invited Keynote Speaker*
 Small Cell Size, Big Implications: Diversity, Episymbiosis, and Disease Association of Ultrasmall Saccharibacteria
 Batbileg Bor, The Forsyth Institute
- 10:25 - 10:45 a.m.** **The Host Strikes Back! C19ORF66 restricts KSHV Lytic Replication by Targeting Viral Gene Translation**
 William Rodriguez, Microbiology, UMass Amherst
- 10:45 - 11:05 a.m.** **The King of Oils: Effect of dietary frankincense on allergic asthma through modulation of the gut microbiome**
 Cassandra Suther, Food Science, UMass Amherst
- 11:05 a.m. - 12:00** **Poster Session 1 and Coffee Break - Poster # 1-30**
- 12:00 - 1:00 p.m.** **Session 2**
- 12:00 - 12:20 p.m.** **Comparative genomics of *Aspergillus oryzae* genomes from different clades reveals signatures of artificial selection in primary and secondary metabolism in domesticated environments**
 Katherine Chacon-Vargas, Molecular and Cell Biology, UMass Amherst
- 12:20 - 12:40 p.m.** **Multiplex imaging in living bacterial cells with fluorogenic RNAs**
 Ru Zheng, Chemistry, UMass Amherst
- 12:40 - 1:00 p.m.** **Using machine learning to understand the determinants of mRNA stability in mycobacteria**
 Huaming Sun, Bioinformatics and Computational Biology, Worcester Polytechnic Institute
- 1:00 - 2:05 p.m.** **Lunch**
- 2:05 - 3:15 p.m.** **Session 3**
- 2:05 - 2:35 p.m.** *Invited Keynote Speaker*
 Building the molecular genetic toolbox to probe mechanisms of RNA-protein interactions in bacteria
 Katherine E. Berry, Dept. of Chemistry and Program in Biochemistry, Mt. Holyoke College

- 2:35 - 2:55 p.m.** **Detection and Characterization of a Novel Small Protein in *Pseudomonas aeruginosa***
Zach Jonas, Amherst College
- 2:55 - 3:15 p.m.** **Evaluation of indole as a prospective natural agent for antimicrobial resistance management**
Xiaoqing Shi, Stockbridge School of Agriculture, UMass Amherst
- 3:15 - 4:10 p.m.** **Poster Session 2 and Coffee Break - Poster # 31-59**
- 4:10 - 5:20 p.m.** **Session 4**
- 4:10 - 4:40 p.m.** ***Invited Keynote Speaker***
Bioprospecting acid mine drainage for bioactive secondary metabolites
Lesley-Ann Giddings, Dept. of Chemistry, Smith College
- 4:40 - 5:00 p.m.** **Metabarcoding analyses of animal-associated foraminifera across built and open environments produce comparable diversity using DADA2 and In-house pipeline**
Rabindra Thakur, Organismic and Evolutionary Biology, UMass Amherst
- 5:00 - 5:20 p.m.** **FISHing for bacterial symbionts within the accessory nidamental gland of *Euprymna scolopes***
Derrick Kamp, Dept. of Molecular and Cell Biology, UCONN
- 5:20 - 5:45 p.m.** **Closing Remarks and Prizes**
- 5:45 - 7:30 p.m.** **Evening Refreshments**

Posters

Please note that underlined individuals are scheduled presenters.

Poster Session 1: 10:45 – 11:25 am: Posters #1-30

Poster Session 2: 2:40 - 3:20 pm: Posters #31-60

- 1. Temperature Sensitivity of Microbial Growth in Warming Soils**
Ashley Eng, Achala Narayanan, Kristen M. DeAngelis
Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA
- 2. Efficacy of Acetic Acid Dissolved in Oil and with W/O Emulsions against *Salmonella Enteritidis* and *Listeria monocytogenes* Desiccated on Stainless Steel Surface**
Shihyu Chuang and Lynne McLandsborough
Dept. of Food Science, UMASS Amherst, Amherst, MA, USA
- 3. Uric acid-degrading bacteria in the gut: A promising Strategy to control Hyperuricemia**
William Wolfe
UMASS Amherst, Amherst, MA, USA
- 4. Actinobacteria Adapt to Drought due to Long-term Soil Warming**
Achala Narayanan and Kristen DeAngelis
Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA
- 5. Impact of Zooplankton Filter Feeding on Sunlight Inactivation of Viruses**
Jackie Wang¹, Alex Stephens¹, Adeline Rickard¹, Ojaswi Aryal¹, Niveen Ismail¹, and Mariana Lopes²
¹Dept. of Engineering, Smith College, Northampton, MA, USA; ²Dept. of Civil and Environmental Engineering, UMASS Amherst, Amherst, MA, USA
- 6. Sugar-coating persistence: metabolic stimulation and efflux pump disruption potentiates Zoliflodacin against stationary phase *Escherichia coli***
Travis J. LaGree, Brandon A. Byrd, and Wendy W.K. Mok
Dept. of Molecular Biology and Biophysics, UCONN Health Center, Farmington, CT, USA
- 7. Is 2DUF enough? Exploring the mechanism and function of novel spore protein, 2DUF, on wet-heat resistance in *Bacillus subtilis***
Angela M. DeMarco, Wendy W. K. Mok, and Peter Setlow
Dept. of Molecular Biology and Biophysics, UCONN Health Center, Farmington, CT, USA
- 8. Chemical mutagenesis of *Listeria monocytogenes* to investigate the genetic basis of benzalkonium chloride tolerance**
Julia Hershelman, Tyler D. Bechtel
UMASS Amherst, Amherst, MA, USA
- 9. The Impact of Microbial Interactions and Environmental Cues on Phenotypic Heterogeneity and Response to Antibiotic Treatment**
Stephanie L. Schofield, Wendy Mok, Angela DeMarco, Brandon Byrd, and Travis LaGree
Dept. of Molecular Biology and Biophysics, UCONN Health Center, Farmington, CT, USA
- 10. Degradation of Residual Nucleic Acid on Surfaces by Commercial Disinfectants**
Sloane Stoufer, Melina Demokritou, and Matthew D. Moore
Dept. of Food Science, UMASS Amherst, Amherst, MA, USA
- 11. YTHDC2 protects SRE containing transcripts from KSHV endonuclease SOX**
Daniel MacVeigh-Fierro¹, Mandy Muller¹, Angelina Cicerchia¹, and Ashley Cadorette²
¹Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA; ²Dept. of Biochemistry and Molecular Biology, UMASS Amherst, Amherst, MA, USA

- 12. Metapangenomes reveal genomic signatures of microbial evolution to long-term soil warming**
Mallory Choudoir
UMASS Amherst, Amherst, MA, USA
- 13. Characterizing aflatoxin degradation by *Rhodococcus* species**
Natalie Sandlin, Marco Zaccaria, and Babak Momeni
Dept. of Biology, Boston College, Newton, MA, USA
- 14. Concentration and Detection of Human Noroviruses from Food and Environmental Samples Using Engineered Norovirus Binding Bacteria**
Anand Soorneedi and Matthew Moore
Dept. of Food Science, UMASS Amherst, Amherst, MA, USA
- 15. Initial methods for an environmental health survey of *Toxoplasma gondii* in Alaskan shellfish**
Kaja Aagaard¹, Samuel C Byrne², Erin M Eggleston¹
¹Dept. of Biology, Middlebury College, Middlebury, VT, USA; ²Dept. of Biology and Global Health Program, Middlebury College, Middlebury, VT, USA
- 16. Small protein affects *Escherichia coli* multi drug efflux pump mediated antibiotic resistance**
Amira Reyad and Mona Wu Orr
Dept. of Biology, Amherst College, Amherst, MA, USA
- 17. The Fight for Viral RNA Fate: Characterizing the Interaction between the anti-viral protein C19ORF66 and the KSHV RNA-binding protein ORF57**
Timothy Mehrmann, William Rodriguez, and Mandy Muller
Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA
- 18. Behind the scene of... albinism in *A. fumigatus***
Paolo D'Avino, Kimberly Acevedo, Katherine Chacon-Vargas, Tyler Bechtel, Colin McCarthy, Victoria Donescu, Julia Hershelman, and John Gibbons
Food Science Dept., UMASS Amherst, Amherst, MA, USA
- 19. Bioinformatics Lab Course for Microbiologists: Improving students' comfort and familiarity with asking and answering questions using programming and sequence analysis**
Kristen DeAngelis¹, Mallory Choudoir, Achala Narayanan¹, Ashley Eng¹, and Maureen Morrow²
¹Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA; ²Dept. of Biology, SUNY New Paltz, New Paltz, NY, USA
- 20. Changes in the Metatranscriptome of Acidobacteria as a Result of Long-Term Soil Warming**
Chris Colvin¹ and Jeffrey Blanchard²
¹Dept. of Molecular and Cell Biology, UMASS Amherst, Amherst, MA, USA; ²Dept. of Biology, UMASS Amherst, Amherst, MA, USA
- 21. Characterization of Viral and Bacterial Dynamics in Lake Champlain Cyanobacterial Harmful Algal Blooms**
Briana Johnson, Gifty Atanga, and Erin M Eggleston
Dept. of Biology, Middlebury College, Middlebury, VT,, USA
- 22. A High Throughput Assay for Inhibitors of the Type 3 Secretion System Translocon Assembly**
Hanling Guo
- 23. Evaluating the risks associated with utilization of modified washing machines in the processing of leafy greens**
Pragathi Kamarasu, Amanda Kinchla, and Matthew Moore
UMASS Amherst, Amherst, MA, USA

- 24. Characterization of drought tolerance genes of *Leifsonia poae* and *Arthrobacter bambusae***
Maureen Morrow¹, Hanaa Ahmed¹, and Kristen DeAngelis²
¹SUNY New Paltz, New Paltz, NY, USA; ²Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA
- 25. Optimization of RNA Display Using GC-Clamp Modifications to Improve Genetic Detection of Bacterial RNA-Protein Interactions**
Linh D. Nguyen¹, Suxuan Wang¹, Silvie Schlein¹, and Katherine E. Berry^{1,2}
¹Program in Biochemistry, Mt. Holyoke College, South Hadley, MA, USA; ²Dept. of Chemistry, Mt. Holyoke College, South Hadley, MA, USA
- 26. Distinguishing between structural models for RNA binding protein ProQ in *E. coli***
Katherine Dailey¹, Suxuan Wang¹, Oliver M. Stockert¹, Smriti Pandey¹, Shiyang Wang^{1,2}, and Katherine E. Berry^{1,3}
¹Program in Biochemistry, Mt. Holyoke College, South Hadley, MA, USA; ²Dept. of Computer Science, Mt. Holyoke College, South Hadley, MA, USA; ³Dept. of Chemistry, Mt. Holyoke College, South Hadley, MA, USA
- 27. Investigating the genetic determinants of *Listeria monocytogenes* stress tolerance through adaptive laboratory evolution**
Tyler Bechtel
Dept. of Food Science, UMASS Amherst, Amherst, MA, USA
- 28. Population Genomics of *Aspergillus sojae* & *Aspergillus parasiticus***
Kimberly Acevedo, John. G. Gibbons, Shu Zao, and Katherine Chacón-Vargas
Dept. of Food Science, UMASS Amherst, Amherst, MA, USA
- 29. Discovering New sRNA-Binding Protein in *Chlamydia trachomatis***
Sungeun Jo¹, Anne L. Williams¹, Aleah M. Larsen¹, Salina Hussain¹, and Katherine E. Berry^{1,2}
¹Program in Biochemistry, Mt. Holyoke College, South Hadley, MA, USA; ²Dept. of Chemistry, Mt. Holyoke College, South Hadley, MA, USA
- 30. Evaluating the structure of the FinO domain of the *Escherichia coli* RNA chaperone protein ProQ**
Suxuan Wang¹, Oliver M. Stockert¹, Smriti Pandey¹, Katherine Dailey¹, Shiyang Wang¹, and Katherine E. Berry^{1,2}
¹Program in Biochemistry, Mt. Holyoke College, South Hadley, MA, USA; ²Dept. of Chemistry, Mt. Holyoke College, South Hadley, MA, USA
- 31. Host phylogeny shapes the microbiome of the female reproductive organ in cephalopods**
Nidhi Vijayan¹, Sarah McAnulty¹, Allison Kerwin², and Spencer Nyholm¹
¹Dept. of Molecular and Cell Biology, UCONN, Storrs, CT, USA; ²Dept. of Biology, McDaniel College, Westminster, MD, USA
- 32. Coronavirus Conundrum: Exploring the differences between severe and non-severe coronaviruses**
Yadi Bermudez, Jacob Miles, and Mandy Muller
Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA
- 33. Elucidation of genetic targets and cellular-physicochemical interactions for prevention of catheter-associated bacterial biofilm infections using a genome-wide approach**
Hyerim Ban^{1,2}, Stephanie N. Call³, Brandon E. Barajas³, Jessica D. Schiffman^{1,2,3}, and Lauren B. Andrews^{1,2,3}
¹Biotechnology Training Program, UMASS Amherst, Amherst, MA; ²Molecular and Cellular Biology Graduate Program, UMASS Amherst, Amherst, MA, USA; ³Dept. of Chemical Engineering, UMASS Amherst, Amherst, MA, USA
- 34. The Hunt for Forest Giant Viruses**
Andrea Dame and Sarah Tucker
UMASS Amherst, Amherst, MA, USA
- 35. The Exchangeability of the GerI Spore Germinant Receptor from *B.cereus* to *B.subtilis***

Sarah DePratti and Peter Setlow

Dept. of Molecular Biology and Biophysics, UCONN Health Center, Farmington, CT, USA

36. *Naegleria's* mitotic spindles are built from unique tubulins

Andrew S. Kennard¹, Katrina B. Velle¹, Andrew J.M. Swafford¹, Luke M. Rice², Patricia Wadsworth¹, and Lillian K. Fritz-Laylin¹

¹Dept. of Biology, UMASS Amherst, Amherst, MA, USA; ²Dept. of Biophysics, UT Southwestern, Dallas, TX

37. Triplet repeats mediated RNA phase transitions in live cells

Zhaolin Xue¹ and Kewei Ren²

¹UMASS Amherst, Amherst, MA, USA; ²Nanjing university of Science and Technology, Najing, China

38. Inducible production of Lipid A by therapeutic *Salmonella* generates innate immune cell activation

Lars Howell and Neil S Forbes

Dept. of Chemical Engineering, UMASS Amherst, Amherst, MA, USA

39. The Impact of Public Versus Private Metabolism on the Stability of Microbial Communities

Jiacheng Wang

UMASS Amherst, Amherst, MA, USA

40. Genetically encoded RNA-based bioluminescent sensors

Lan Mi

UMASS Amherst, Amherst, MA, USA

41. Converting to a CURE: MCC community supporting faculty to introduce research into their laboratory courses

Amy Springer

Dept. of Biochemistry and Molecular Biology, UMASS Amherst, Amherst, MA, USA

42. Season influences long-term warming's impact on ecosystem multifunctionality and microbial diversity

Melissa Shinfuku¹, Luiz Domeignoz-Horta², Mallory Choudoir¹, and Kristen DeAngelis¹

¹Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA; ²Dept. of Evolutionary Biology and Environmental Studies, University of Zürich, Zürich, Switzerland

43. Lipid-DNA conjugate for selective and efficient modification on bacterial membranes

Qian Tian, Yousef Bagheri, and Mingxu You

Dept. of Chemistry, UMASS Amherst, Amherst, MA, USA

44. Finding a Small Gene in *P. aeurgonisa*: How Do Small Gene Discovery Algorithms Perform?

Adan Lepe¹, Mona Wu Orr¹, and Gisela Storz²

¹Dept. of Biochemistry, Amherst College, Amherst, MA, USA; ²NICHD, NIH USA

45. Optimization of the Pegylation assay to study the topology of PopD translocon from *Pseudomonas aeruginosa* in native membranes

Marco Brovedan, Kyle Mahan, Yuzhou Tang, and Alejandro P. Heuck

Dept. of Biochemistry and Molecular Biology, UMASS Amherst, Amherst, MA, USA

46. Soil Respiration Over Seasons, Across Depths, and In Response to Soil Warming and Nitrogen Addition

Genevieve Goebel¹, Melissa Knorr², Sarah Goldsmith¹, Owen Krol¹, Serita Frey², and Caitlin Hicks Pries¹

¹Dept. of Biology, Dartmouth College, Hanover, NH, USA; ²Dept. of Natural Resources & the Environment, University of NH, Durham, NH, USA

47. Single-celled transcriptomics to uncover links between morphology, phylogeny, and behavior in test-building *Arcellinida*

Claire Jordan, Beatrice Wendling, and Laura Katz

Smith College, Northampton, MA, USA

48. Exploring the diversity of microbial eukaryotes living inside *Nepenthes* pitcher plants

Jailene C. Gonzalez¹, Laura A. Katz^{1,2}, and Adri K. Grow¹

¹Dept. of Biological Sciences, Smith College, Northampton, MA, USA; ²Program in Organismic and Evolutionary Biology, UMASS Amherst, Amherst, MA, USA

49. Deploying microscopy and molecular tools to illuminate the nuclear nature of ciliate species and their associated microbiomes

Ragib Ahsan¹, Wumei Blanche¹, Julia Sullivan¹, and Laura A. Katz^{1,2},

¹Dept. of Biological Sciences, Smith College, Northampton, MA, USA; ²Program in Organismic and Evolutionary Biology, UMASS Amherst, Amherst, MA, USA

50. Discovering freshwater foraminifera biodiversity using a metabarcoding approach

Adri K. Grow¹ and Laura A. Katz^{1,2}

¹Dept. of Biological Sciences, Smith College, Northampton, MA, USA; ²Program in Organismic and Evolutionary Biology, UMASS Amherst, Amherst, MA, USA

51. Meiosis-related gene search in foraminifera: an evolutionary viewpoint of meiosis in an early eukaryote

Rabindra Thakur^{1,2}, My My Tran¹, Kristina Le¹, Emma Schumacher¹, Caitlin Timmons¹, Anna-Lee Thompson¹, Xyrus Maurer-Alcala¹, and Laura A. Katz^{1,2}

¹Dept. of Biological Sciences, Smith College, Northampton, MA, USA; ²Program in Organismic and Evolutionary Biology, UMASS Amherst, Amherst, MA, USA

52. Evidence of alternative splicing complexity in the ciliate transcriptome with A case study of the ciliate class Heterotrichea

Shahed Uddin Ahmed Shazib¹, Yurui Wan¹, and Laura A. Katz^{1,2},

¹Dept. of Biological Sciences, Smith College, Northampton, MA, USA; ²Program in Organismic and Evolutionary Biology, UMASS Amherst, Amherst, MA, USA

53. Mycorrhizal and Rhizosphere Characterization of Tundra Plants

Sean R. Schaefer¹, Caitlin Hicks Pries², Sarah Goldsmith², and Jessica G. Ernakovich¹

¹University of NH, Durham, NH, USA; ²Dartmouth College, Hanover, NH, USA

54. The role of tuberculostearic acid in the integrity of mycobacterial plasma membrane

Malavika Prithviraj¹, Takehiro Kado¹, M. Sloan Siegrist¹, Yasu S. Morita¹, Jacob Allan Mayfield², David Young², Annie D. Huang², D. Branch Moody², Daisuke Motooka³, and Shota Nakamura³

¹Dept. of Microbiology, UMASS Amherst, Amherst, MA, USA; ²Division of Rheumatology, Immunology and Allergy, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA; ³Research Institute for Microbial Diseases, Osaka University, Suita, Osaka, Japan

55. The role of the chaperone Hsp104 in connecting the amyloid state to its prion phenotype

Afua Adusei, Wesley Naeimi, Nicole Seah, and Tricia Serio

Dept. of Biochemistry and Molecular Biology, UMASS Amherst, Amherst, MA, USA

56. Visualizing the life cycle of *Allogromia laticollaris*, a single-chambered foraminiferan, through light and confocal microscopy

Hannah Rappaport¹, Caitlin Timmons¹, Elinor Sterner¹, Kristine Le¹, and Laura A. Katz^{1,2}

¹Dept. of Biological Sciences, Smith College, Northampton, MA, USA; ²Program in Organismic and Evolutionary Biology, UMASS Amherst, Amherst, MA, USA

57. A metatranscriptomic analysis of the long-term effects of warming on the Harvard Forest soil microbiome

Brooke Linnehan

UMASS Amherst, Amherst, MA, USA

58. Improving specificity of the LasR homoserine lactone quorum sensor in bacterial consortia using

site-directed and saturation mutagenesis

Min Zeng¹, Vanessa Vu², Stephanie Call¹, and Lauren B. Andrews^{1,3,4}

¹Dept. of Chemical Engineering, UMASS Amherst, Amherst, MA, USA; ²Dept. of Biochemistry and Molecular Biology, UMASS Amherst, Amherst, MA, USA; ³Molecular and Cellular Biology Graduate Program, UMASS Amherst, Amherst, MA, USA; ⁴Biotechnology Training Program, UMASS Amherst, Amherst, MA, USA

59. Resistance Variation To Necrotrophic And Biotrophic Diseases Caused By Fungi on Grape

Elsie Murphy¹, M. Hood², and Elsa Petit¹

¹Stockbridge School of Agriculture, UMASS Amherst, Amherst, MA, USA; ²Dept. of Biology, Amherst College, Amherst, MA, USA

Carolina Santamaria, Harita Sistu, Eileen Black, Irene Lepori, Briana Kubik, Kiserian Jackson, Eddy Hernandez, Gema Garcia, Yajaira Bermudez, and Stefanos Stravoravdis

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We are Valley Microbes.

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