



Pioneer Valley Microbiology Symposium 2019

Are you a Valley Microbe?

Program

January 18, 2019

- 9:00 – 9:30 am** **Registration and Coffee Break**
- 9:30 – 9:35 am** **Opening Remarks**
Dr. James Holden, Chair, Microbiology, UMass Amherst
- 9:35 – 10:50 am** **Session 1**
- 9:35 – 10:05 am ***Manipulation of RNA stability: a cornerstone of the viral-host battle***
Dr. Mandy Muller, Microbiology, UMass Amherst
- 10:05 – 10:20am ***Channel proteins are implicated in ATP synthase clearing from the forespore engulfing membrane during early stages of sporulation in Bacillus subtilis***
Megan Littlehale, Mount Holyoke College
- 10:20 – 10:35 am ***Life on the Leaves: Understanding Dynamic Plant Microbe Relationships on Pasture Grass***
Emily Bechtold, Microbiology, UMass Amherst
- 10:35 – 10:50 am ***Human milk oligosaccharides alter the metabolism of gut microbes in a modeled ecosystem***
Ezgi Özcan, Food Science, UMass Amherst
- 10:50 – 11:10 am** **Coffee Break**
- 11:10 – 12:10 pm** **Session 2**
- 11:10 – 11:25 am ***A Scalable Approach to Logic Gate Design using TAL Effector-Based Synthetic Repressors***
Nathaniel Howitz, Chemical Engineering, UMass Amherst
- 11:25 – 11:40 am ***Development and Field Testing of Highly Sensitive qPCR Assays to Detect Ross River Virus and other Arboviruses in Mosquitoes***
Jessica Grant, Biological Sciences, Smith College
- 11:40 – 11:55 am ***The role of RNase E in mRNA metabolism in Mycobacterium smegmatis***
Ying Zhou, Biology and Biotechnology, Worcester Polytechnic Institute
- 11:55 – 12:10 pm ***Exploring the role of microbiome-pathogen interactions during disease in D. melanogaster***
Danielle Andrzejewski Lesperance, Molecular and Cell Biology, UConn
- 12:10 – 1:40 pm** **Lunch**
- 1:40 – 2:55 pm** **Session 3**
- 1:40 – 2:10 pm ***The Avian Microbiome: Past, Present and Future***
Dr. Sarah Hird, Molecular and Cell Biology, UConn
- 2:10 – 2:25pm ***Re-examining electron transfer in anaerobic microbial environments***
Dr. David Walker, Microbiology, UMass Amherst

- 2:25 – 2:40 pm ***Examining the Role of External Nutrient Availability on the Expression of a *Vibrio cholerae* Metabolic Virulence Factor in the Model Host System *Drosophila melanogaster****
Elisa Bello, Biology, Amherst College
- 2:40 – 2:55 pm ***Using single-cell 'omics to study biodiversity and population genetics of testate amoebae***
Agnes Weiner, Biological Sciences, Smith College
- 2:55 – 4:45 pm Poster Session and Coffee Break**
2:55-3:50 pm Even numbered posters
3:50-4:45 pm Odd numbered posters
- 4:45 – 6:00 pm Session 4**
4:45 – 5:00 pm ***Probing the molecular mechanism of ProQ-RNA interactions using a bacterial three-hybrid assay***
Smriti Pandey, Biochemistry, Mount Holyoke College
- 5:00 – 5:15 pm ***Testing glucosylceramide transferase as a potential target for developing anti-giardial therapy***
Jasmine Moss, Microbiology, UMass Amherst
- 5:15 – 5:30 pm ***Mycobacterium tuberculosis susceptibility and survival under antibiotic pressure***
Michele Bellerose, Microbiology and Physiological Systems, UMass Medical
- 5:30 – 6:00 pm ***Spatial Variations in Microbial Processes Controlling Carbon Oxidation Rates in Soils***
Dr. Marco Keiluweit, Stockbridge School of Agriculture, UMass Amherst
- 6:00 – 6:15 pm Closing Remarks and Prizes**
- 6:15 – 7:30 pm Refreshments**

Posters

- 1. Probing the molecular mechanism of ProQ-RNA interactions using a bacterial three-hybrid assay**
Smriti Pandey, Chandra Gravel, Chukwuamaka Onyewadume, Katherine E. Berry
Dept. of Chemistry and Program in Biochemistry, Mount Holyoke College
- 2. Upregulating the master motility regulator, *flhDC*, in *Salmonella* increases intracellular invasion and colonization of tumor masses**
Vishnu Raman¹, Nele Van Dessel¹, Owen O'Connor¹, Neil S. Forbes^{1,2}
¹Dept. of Chemical Engineering, ²Institute for Applied Life Sciences, UMass Amherst
- 3. Divergence of the human milk oligosaccharide (HMO) utilization cluster among *Bifidobacterium longum* subspecies *infantis* strains**
Korin Albert^{1,2} Asha Rani², and David A. Sela^{1,2,3}
¹Molecular and Cellular Biology Graduate Program, ²Dept. of Food Science, UMass Amherst, ³Dept. of Microbiology and Physiological Systems, UMass Medical School
- 4. Understanding the mechanism of the SOS response to help design better antibiotics**
Steven Van Alstine and Steven Sandler
Dept. of Microbiology, UMass Amherst
- 5. Structural Analysis of the Phyllosphere of Key Amazonian Forage Grasses Based on Leaf Senescence**
Stephanie Ryan
Dept. of Microbiology, UMass Amherst
- 6. Quantitative understanding of lipid-mediated DNA probe modification on mammalian cell membranes**
Yousef Bagheri, Bin Zhao, Mingxu You
Dept. of Chemistry, UMass Amherst
- 7. The Story of C19ORF66, an Uncharacterized Host Factor, Resisting KSHV-induced mRNA decay and Restricting Viral Infection**
William Rodriguez and Mandy Muller
Dept. of Microbiology, UMass Amherst
- 8. New pathway for hydroxyl radical generation associated with *Cryptococcus neoformans* pathogenesis in mice cortical tissues**
Mrinalini Ghoshal and Barry Goodell
Dept. of Microbiology, UMass Amherst
- 9. Transmembrane Domain in a Syntaxin Protein involved in Legume-Rhizobia Symbiotic Interaction May Determine its Differential Subcellular Localization**
Jedaidah Chilufya¹, Xiaoyi Wu² and Dong Wang^{1,2}
¹Plant Biology Graduate Program, ²Biochemistry and Molecular Biology Dept., Plant Biology, UMass Amherst
- 10. Microbial Succession of a Newly Developed Aquaponics System**
Tanzin Begam, Kendra Maas
Microbial Analysis, Resources, and Services, UConn
- 11. Regulation of mRNA stability in mycobacteria as an adaptive response to stress conditions**
Diego A Vargas Blanco¹, Ying Zhou¹, Tim D Antonelli², Scarlet S Shell¹
¹Biology & Biotechnology, Worcester Polytechnic Institute, ²Mathematics, Worcester State University

12. Investigating the Glycerol Degradation Pathway as a Regulator of Acetyl-CoA Synthetase

Expression in *Vibrio fischeri*

Sarah Wishloff¹, Stephany Flores-Ramos¹, Sarah Nessen¹, Cecilia Prado¹, Mark Mandel²,
Alexandra Purdy¹

¹Dept. of Biology, Amherst College, ²Dept. of Medical Microbiology and Immunology, University of Wisconsin-Madison

13. Controlling *Salmonella* on alfalfa sprouts using lactic cultures

Janeth Perez-Garza, Deepa Ashwarya Kuttappan, Mary Anne Amalaradjou
UConn

14. Identification and Quantification of *Saccharomyces cerevisiae* in an Equine Probiotic

Alexandra Norton and Janet Williams
Dept. of Biology, Elms College

15. Defining the CrbS/R regulatory landscape in *Vibrio* and *Pseudomonas* strains

Emily Flaherty¹, Cecilia Prado¹, Josh Sharp², and Alexandra E. Purdy¹

¹Dept. of Biology, Amherst College, ²Dept. of Biology, Northern Michigan University

16. Protistan Ecology of Narragansett Bay Benthic Habitats

Erin S. Frates¹, Alia Al-Haj², Robinson W. Fulweiler², Roxanne A. Beinart³

¹Dept. of Cell and Molecular Biology, University of Rhode Island, ²Depts. of Earth and Environment and
Biology, Boston University, ³Graduate School of Oceanography, University of Rhode Island

17. Anti-filarial Activity of Natural Neuroleolin D and Synthetic Neuroleolin Derivatives

Lizzette Perez-Perez¹, Susan Haynes¹, Jessica Grant¹, Kevin M. Shea², Steven A. Williams¹

¹Dept. of Biological Sciences, Smith College, ²Dept. of Chemistry, Smith College

18. Surveying microbial eukaryote diversity at different scales

Robin S. Sleith^{a*}, Rabindra Thakura^{b*}, Jean-David Grattepanche^{a,c}, Laura A. Katz^{a,b}

^aDept. of Biological Sciences, Smith College, ^bProgram in Organismic and Evolutionary Biology, UMass
Amherst, ^cDept. of Biology, Temple University, *Both authors contributed equally

19. A Metagenomic Approach to Evaluating Surface Water Quality in Haiti

Monika A. Roy^{1,2}, Jean M. Arnaud¹, Paul M. Jasmin³, Steve Hamner¹, Nur A. Hasan^{4,5}, Rita R. Colwell^{4,5},
Timothy E. Ford¹

¹Dept. of Environmental Health Sciences, School of Public Health & Health Sciences, UMass Amherst,

²Biotechnology Training Program, UMass Amherst, ³Equipes mobiles d'intervention rapide (EMIRA) du
Ministère de la Santé Publique et de la Population (MSPP), ⁴CosmosID Inc., ⁵Center for Bioinformatics and
Computational Biology, University of Maryland

20. Enzyme production by the ectomycorrhizal fungus *C. geophilum* across varying substrate availability and soil moisture conditions

Corinne Vietorisz and Ashley Lang
Dartmouth College

21. Material Stiffness and Hydration Influence Bacterial Attachment

Irene S. Kurtz and Jessica D. Schiffman
Dept. of Chemical Engineering, UMass Amherst

22. Testate Amoebae Community Diversity Across Seasonal Change in New England Bogs and Fens

Olivia Dufour^a, Ketty Munyenyembe^a, Grace Apodaca^a, Jailene Gonzalez^a, Laura A. Katz^{a,b}, Agnes Weiner^a

^aDept. of Biological Sciences, Smith College, ^bProgram in Organismic and Evolutionary Biology, UMass Amherst

23. Temperature adaptation and genome dynamics in Thermotogae

Anne A. Farrell, Camilla Nesbø, and Olga Zhaxybayeva

Dartmouth College

24. Analysis of the CYP51 paralogs and their potential role in differential sensitivity to fungicides in *Calonectria pseudonaviculata* and *C. henricotiae*

Stefanos Stravoravdis¹, Nicholas R. LeBlanc², Robert E. Marra³, Jonathan P. Hulvey¹, Jo Anne Crouch²

¹Eastern Connecticut State University, ²USDA-ARS, ³Connecticut Agricultural Experiment Station

25. Elucidating the Impact of Allosteric Regulation on the AAA+ Protease Lon

Elizabeth A. Bond¹, Rilee Zeinert², and Dr. Peter Chien^{1,2}

¹Dept. of Biochemistry and Molecular Biology, UMass Amherst, ²Molecular and Cellular Biology, UMass Amherst

26. The grape microbiome in wild and domesticated grapes

Matthew Lyons and Elsa Petit

UMass Amherst

27. The Microbial Community of Kitchen Sponges: Experimental Study Investigating Bacterial Number, Composition and Resistance

Sydney Knoll, Nicholina Allain and Aisling Dugan

Natural Science Dept., Assumption College

28. Urea nitrogen utilization is restored by complementing a mutation in the *Bifidobacterium suis* UMA399 ureC gene

Yang Lyu¹, Korin Albert^{1,2} and David A. Sela^{1,2,3,4}

¹Dept. of Food Science, UMass Amherst, ²Molecular and Cellular Biology Graduate Program, UMass Amherst,

³Dept. of Microbiology, UMass Amherst, ⁴Dept. of Microbiology and Physiological Systems, UMass Medical School

29. Phylogenomic reconstruction of the phylum Ciliophora using single-cell 'omics'

Yurui Wang^{1,2*}, Ying Yan^{2*}, Laura A. Katz²⁺, Feng Gao¹⁺, Weibo Song¹

¹Institute of Evolution and Marine Biodiversity, Ocean University of China, ²Dept. of Biological Sciences, Smith College, *Both authors contributed equally, +Corresponding authors

30. Role of ORF20 During KSHV Infection

Danielle Hoffman and Mandy Muller

Dept. of Microbiology, UMass Amherst

31. Effects of Extracts from *Scutellaria barbata* and *Hedyotis diffusa* on Regeneration in Planarian Flatworms

Joey Jackson and Janet Williams

Dept. of Biology, Elms College

32. Chemical-genetic interactions of essential *Mycobacterium tuberculosis* systems

Eun-Ik Koh, Megan K. Proulx, Kenan C. Murphy, Kadamba G. Papavinasasundaram, Richard E. Baker, Christopher M. Sasseti
Dept. of Microbiology and Physiological Systems, UMass Medical School

33. *Bifidobacterium infantis* utilization of human milk oligosaccharides as a primary nitrogen source

Xiaomeng You¹, Ezgi Özcan¹, Asha Rani¹, and David A. Sela^{1,2,3}
¹Dept. of Food Science, UMass Amherst, ²Dept. of Microbiology, UMass Amherst, ³Center for Microbiome Research, UMass Medical School

34. Trehalose recycling promotes redox and metabolic homeostasis in carbon-starved mycobacteria

Amol Arunrao Pohane¹, Caleb R Carr¹, Jaishree Garhyan¹, M. Sloan Siegrist^{1,2}
¹Dept. of Microbiology, UMass Amherst, ²Molecular and Cellular Biology Graduate Program, UMass Amherst

35. Testing Sesquiterpene Lactones from *Neurolaena lobata* as Potential Drugs for Treating Lymphatic Filariasis

Lydia DeAngelo¹, Dinah Nahid¹, Peyton Higgins³, Katie McGeough³, Sue Haynes¹, Kevin M. Shea³, Steven A. Williams^{1,2}
¹Dept. of Biological Sciences, Smith College, ²Program in Molecular and Cellular Biology, UMass Amherst, ³Dept. of Chemistry, Smith College

36. Fecal Microbiomes of Saltmarsh Sparrows (*Ammodramus caudacutus*)

Elizabeth A. Herder¹, Kirsten Grond¹, Chris Elphick², Sarah Hird¹
¹Molecular and Cell Biology Dept., UConn, ²Ecology and Evolutionary Biology Dept., UConn

37. A Novel Role for cAMP in the Regulation of the Acetate Switch in the *Euprymna scolopes* – *Vibrio fischeri* Model System?

Gabby Ro, Sarah Nessen, and Alexandra Purdy
Dept. of Biology, Amherst College

38. Characterizing Hfq-RNA interactions using a bacterial three-hybrid assay

Hannah LeBlanc, Anh M. Tran, Kelly Chambers, Katherine E. Berry
Dept. of Chemistry and Program in Biochemistry, Mount Holyoke College

39. Authentic research as a capstone course in the teaching laboratory: comparative studies of malate dehydrogenase isoforms in trypanosomes

Amy L. Springer
Dept. of Biochemistry and Molecular Biology, UMass Amherst

40. Inducible Peptidoglycan Cross-linking by D-amino Acid Chemical Reporters

Arjun K. Aditham², Akbar Espailat^{3,4}, Justin Kim², Peyton Shieh², Felipe Cava^{3,4}, Carolyn R. Bertozzi^{2,4}, Sylvia L. Rivera¹, M. Sloan Siegrist^{1,2*}
¹Dept. of Microbiology, UMass Amherst, ²Dept. of Chemistry, University of California, Berkeley, ³Dept. of Molecular Biology, Umeå University, ⁴Laboratory for Molecular Infection Medicine Sweden (MIMS), Umeå University, ⁵Dept. of Plant and Microbial Biology, University of California, Berkeley

41. Analysis of a Putative *Brugia malayi* POU-homeodomain Transcription Factor

Hafsa Mire¹, Nicole Furmento^{1,2}, McKayla Ford³, Sanna Muhammed¹, Hannah Snell¹, Steven A. Williams^{1,3}
¹Dept. of Biochemistry, Smith College, ²Cellular and Molecular Medicine Program, Johns Hopkins, ³Dept. of Biological Sciences, Smith College

42. Optimization of a Bacterial-Three Hybrid Assay for Hfq-sRNA Interactions

Courtney Hegner, Clara Wang, Rachel Mansky, Katherine E. Berry
Dept. of Chemistry, Dept. of Biology, and Program in Biochemistry, Mount Holyoke College

- 43. Investigation of putative virulence factors in *Chlamydia trachomatis* serovar D**
June Graham and Rebeccah Lijek
Dept. of Biological Sciences, Mount Holyoke College
- 44. Effect of Depo-Provera Administration and *Chlamydia trachomatis* Infection on Antimicrobial Peptide Expression in the Female Reproductive Tract**
Sarah Afzaal, Emily Webster, and Rebeccah Lijek
Dept. of Biological Sciences, Mount Holyoke College
- 45. Environmental influences on microbial community structure in fungus-growing ant gardens**
Kevin M. Lee, Jonathan L. Klassen
Dept. of Molecular and Cell Biology, UConn
- 46. Studying gene family evolution and genome diversity of ciliates using single-cell 'omics**
Ying Yan^{1*}, Xyrus X. Maurer-Alcalá^{1,2,6*}, Rob Knight^{3,4,5}, Laura A. Katz^{1,2}
¹Dept. of Biological Sciences, Smith College, ²Program in Organismic and Evolutionary Biology, UMass Amherst, ³Dept. of Pediatrics, University of California San Diego, ⁴Dept. of Computer Science and Engineering, University of California San Diego, ⁵Center for Microbiome Innovation, University of California San Diego, ⁶Present address: Institute of Cell Biology, University of Bern, *Both authors contributed equally
- 47. Does Oxygen Contribute to *acs* Regulation? Searching for Environmental Regulators of *acs* Expression in *Vibrio fischeri***
Kennedy Countess, Cecilia Prado, and Alexandra Purdy
Dept. of Biology, Amherst College
- 48. Pathogen Weather Mapping: Metagenomics sequencing, geospatial technology and public health data mining**
Arianna Comendul
Dept. of Public Health, School of Public Health and Health Sciences, UMass Amherst
- 49. Hidden relationships: searching for bacterial symbionts in free-living testate amoebae**
Dana Ragoonanan^{a*}, Adena Collens^{a*}, Laura A. Katz^{a,b}, Agnes K.M. Weiner^a
^aDept. of Biological Sciences, Smith College, ^bProgram in Organismic and Evolutionary Biology, UMass Amherst, *both authors contributed equally

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