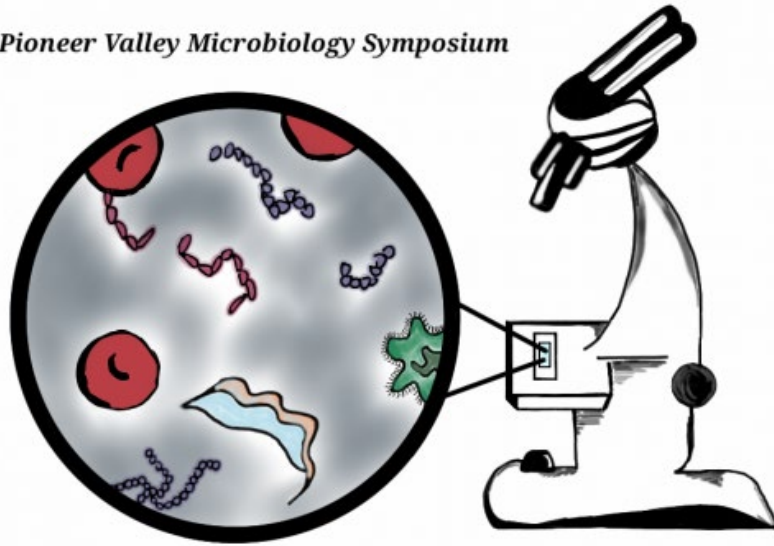


Pioneer Valley Microbiology Symposium



Pioneer Valley Microbiology Symposium 2020

Are you a Valley Microbe?

Program

January 25, 2020

- 9:00 – 9:30 am** **Registration and Coffee**
- 9:30 – 9:35 am** **Opening Remarks:** James Holden, Chair, Microbiology, UMass Amherst
- 9:35 – 10:50 am** **Session 1**
- 9:35 – 10:05 am ***Deciphering the survival strategies of bacterial persisters*** (invited keynote)
 Wendy Mok, Dept. of Molecular Biology and Biophysics, UConn
- 10:05 – 10:25am ***Investigating the Mechanisms of Antifungal Resistance in Invasive Plant Pathogens using Genomics Tools***
 Stefanos Stravoravdis, Biology Dept., Eastern Connecticut State University
- 10:25 – 10:45 am ***Chemical and mechanical properties of polymer thin films affect the initial adhesion of Staphylococcus aureus***
 Irene Kurtz, Dept. of Chemical Engineering, UMass Amherst
- 10:45 – 11:25 am** **Poster Session 1 (Posters #1-20) and Coffee Break**
- 11:25 am – 12:25 pm** **Session 2**
- 11:25 – 11:45 am ***Microbial diversity drives carbon use efficiency in a model soil***
 Luiz Domeignoz-Horta, Microbiology Dept, UMass Amherst
- 11:45am – 12:05 pm ***Implementation of engineered Dysgonomonas to study microbial interactions in the termite hindgut***
 Charles Bridges, Dept. of Molecular and Cell Biology, UConn
- 12:05 – 12:25 pm ***Investigating the Role of ArcAB and Redox in Regulating Acetate Metabolism in the Vibrio fischeri-Hawaiian Bobtail Squid Symbiosis***
 Kyra Raines, Dept. of Biology, Amherst College
- 12:25 – 1:30 pm** **Lunch**
- 1:30 – 2:40 pm** **Session 3**
- 1:30 – 2:00 pm ***Genomics of Aspergillus: the Dr. Jekyll and Mr. Hyde of Fungi*** (invited keynote)
 John Gibbons, Dept. of Food Science, UMass Amherst
- 2:00 – 2:20 pm ***Human gut bifidobacteria that encode the gadB and gadC genes produce the inhibitory neurotransmitter γ -aminobutyric acid***
 Michelle Rozycki, Dept. of Food Science, UMass Amherst
- 2:20 – 2:40 pm ***Identification and characterization of curcumin-metabolizing gut bacteria***
 Ermin Zhao, Dept. of Food Science, UMass Amherst
- 2:40 – 4:00 pm** **Poster Sessions 2 & 3 and Coffee Break**
- 2:40 - 3:20 pm Poster Session 2: #21-40
- 3:20 - 4:00 pm Poster Session 3: #41-62
- 4:00 – 4:50 pm** **Session 4**
- 4:00 – 4:20 pm ***Is it a GTA or not?: A machine learning approach to distinguish Gene Transfer Agents (GTAs) from integrated viruses***
 Roman Kogay, Dept. of Biological Sciences, Dartmouth College
- 4:20 – 4:50 pm ***AAA+ proteases control bacterial growth and stress responses*** (invited keynote)
 Peter Chien, Dept. of Biochemistry and Molecular Biology, UMass Amherst
- 5:00 – 5:30 pm** **Closing Remarks and Prizes**
- 5:30 – 7:00 pm** **Refreshments**

Posters

Please note that underlined individuals are scheduled presenters.

Poster Session 1: 10:45 – 11:25 am: Posters #1-20

Poster Session 2: 2:40 - 3:20 pm: Posters #21-40

Poster Session 3: 3:20 - 4:00 pm: Posters #41-62

- 1. Investigation of a putative virulence factor, CT166, in *Chlamydia trachomatis***
Hannah R. Knapp-Broas, June Graham, Kyra Sieger, Everett Webster, and Rebeccah S. Lijek
Dept. of Biological Sciences, Mount Holyoke College, South Hadley, MA
- 2. The effect of *Lactobacillus*-inhibiting-isolates on *Crithidia bombi* levels in *Bombus impatiens***
Jane Milcetic¹, Chris Vriezen¹, Lynn Adler²
¹Dept. of Biological Sciences, Smith College, Northampton, MA, ²Biology Dept., UMass Amherst, Amherst, MA
- 3. N6-Methyladenosine (m6A) protects key mRNAs from viral induced mRNA degradation**
Daniel MacVeigh-Fierro, Mandy Muller, Angelina Cicerchia
Microbiology Dept., UMass Amherst, Amherst, MA
- 4. Testing Mushroom Extracts and Plant Essential Oils for their Effect on Biofilms in *Pseudomonas fluorescens* and *Chromobacterium violaceum***
Mitchell R. Cristofori, Johnathan Hulvey
Biology Dept., Eastern Connecticut State University, Willimantic, CT
- 5. Discovery of inhibitors of T3SS translocon assembly**
Hanling Guo¹, Mariana Breña², Alejandro Heuck²
¹Molecular and Cellular Biology Graduate Program, ²Dept. of Biochemistry and Molecular Biology, UMass Amherst, Amherst, MA
- 6. Bacteria Identified from an Athletic Turf Field at MCLA**
Issa Jalloh, Elizabeth Billetz
Biology Dept., Massachusetts College of Liberal Arts, North Adams, MA
- 7. The effects of nutrient source and oxygen availability on gene expression in uropathogenic *Escherichia coli***
Grace M. Moore, Christine White-Ziegler
Dept. of Biological Sciences, Smith College, Northampton, MA
- 8. Surveying microbial eukaryote diversity in phytotelmata habitats**
Robin S. Sleith¹, Berry Williams¹, Laura A. Katz^{1,2}
¹Smith College, Dept. of Biological Sciences, Northampton, MA, ²Program in Organismic and Evolutionary Biology, UMass Amherst, Amherst, MA
- 9. Transfection in *Brugia Malayi*: Transgenesis to Cure LF**
Hannah Snell¹, Jessica Grant², Susan J. Haynes², Steve Williams²
¹Dept. of Biochemistry, ²Dept. of Biological Sciences, Smith College, Northampton, MA
- 10. Iron Corrosion via Direct Metal-Microbe Electron Transfer by *Geobacter sulfurreducens***
Hai-Yan Tang¹, Conor C. Pittman¹, Chuntian Yang², Toshiyuki Ueki¹, Dawn E. Holmes¹, Dake Xu², Derek R. Lovley¹
¹Dept. of Microbiology, UMass Amherst, Amherst, MA, ²School of Materials Science and Engineering, Northeastern University, Shenyang, China
- 11. Ecological Distribution of Testate Amoeba in New England bogs**
Evelyn G. E. Hoffman¹, Olivia Dufour¹, Laura A. Katz^{1,2}, Agnes K.M. Weiner¹
¹Dept. of Biological Sciences, Smith College, Northampton, MA, ²Program in Organismic and Evolutionary Biology, UMass Amherst, Amherst, MA

12. Optimization of a bacterial-three hybrid assay for discovery and characterization of sRNA-binding proteins

Rachel Mansky¹, Clara Wang², Courtney Hegner¹, Katherine E. Berry¹

¹Program in Biochemistry, Dept. of Chemistry, ²Dept. of Biology, Mount Holyoke College, South Hadley, MA

13. The mechanism of prion loss by excess Hsp104

Afua Adusei, Wesley Naeimi, Tricia Serio

Dept. of Biochemistry and Molecular Biology, UMass Amherst, Amherst, MA

14. Characterizing nuclear architecture and genome size in uncultivable ciliates through fluorescent microscopy

Caitlin Timmons¹, Ying Yan¹, Laura A. Katz^{1,2}

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

15. Extremely short introns in *Loxodes* (Protist, Ciliophora)

Ying Yan¹, Laura A. Katz^{1,2}

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

16. A refined approach to assess Foraminifera diversity at different habitats using High-throughput sequencing

Rabindra Thakur¹, Robin S. Sleith², Laura A. Katz^{1,2}

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

17. The chytrid fungus *Batrachochytrium dendrobatidis* has both animal-like and yeast-like actin networks

Sarah M. Probst, Lillian Fritz-Laylin

Biology Dept., UMass Amherst, Amherst, MA

18. Evolution of DNA Packaging Machinery in Gene Transfer Agents

Emma Esterman¹, Zhengshuang Hua¹, Yuri Wolf², Eugene Koonin², Olga Zhaxybayeva¹

¹Dept. of Biological Sciences, Dartmouth College, Hanover, NH, ²National Center for Biotechnology Information, National Library of Medicine, National Institutes of Health, Bethesda, MD

19. The Human Microbiome in Asthma during *Boswellia serrata* and Bacterial Regimens

Cassandra Suther¹, Yanjiao Zhou²

¹Dept. of Food Science, UMass Amherst, Amherst, MA, ²Dept. of Immunology, UConn Health Center, Farmington, CT

20. Can global warming impact the genomes of soil microbial communities?

Damayanti Rodriguez-Ramos, Luiz A. Domeignoz-Horta, Kristen M. DeAngelis

Microbiology Dept., UMass Amherst, Amherst, MA

21. Impact of Post Treatment Conditions on *E. coli* Persistence and Resistance Development

Hanna Englander, Blesing Zenick

Dept. of Molecular Biology and Biophysics, UConn Health, Farmington, CT

22. Assessing the mode of metabolic regulation by glycerol-3-phosphate in *Vibrio fischeri*

Samantha Liu, Cecilia Prado, Alexandra E. Purdy

Dept. of Biology, Amherst College, Amherst, MA

23. *In vivo* Testing of *Borrelia burgdorferi* Strains and Development of a Multiplex qPCR Assay for Detection of Infectivity-Associated Plasmids

Patrick Pearson, Adam Lynch, Guang Xu, and Stephen Rich

Laboratory of Medical Zoology, Microbiology Dept., UMass Amherst, Amherst, MA

24. *Bifidobacterium infantis* Metabolizes Free and HMO-Derived Fucose to Produce 1,2-Propanediol in the Infant Gut

Liv R. Dedon¹, Ezgi Özcan¹, Asha Rani¹, David A. Sela^{1,2,3}

¹Dept. of Food Science, UMass Amherst, Amherst, MA, ²Dept. of Microbiology, UMass Amherst, Amherst, MA,

³Dept. of Microbiology and Physiological Systems and Center for Microbiome Research, UMass Medical School, Worcester, MA

25. The impact of overexpression of small regulatory RNAs on *Escherichia coli* biofilm formation

Maggie Prentice, Christine White-Ziegler, Grace Moore, Chris Vriezen

Dept. of Biological Sciences, Smith College, Northampton, MA

26. Developing a Sensitive, Species Specific qPCR Diagnostic Assay for *Schistosoma Japonicum*

Sara Halili, Steven Williams

Dept. of Biological Sciences, Smith College, Northampton MA

27. A Shift in the Right Direction?: The Role of C19ORF66 in KSHV Lytic Infection

William Rodriguez, Mandy Muller

Microbiology Dept., UMass Amherst, Amherst, MA

28. Development of a Novel Quantitative Real-Time PCR Diagnostic Assay for Harbor Seal Lungworm (*Otstrongylus circumlitus*)

Samantha D. Torquato¹, Clara R. Malekshahi¹, William D. Sandke¹, Kalani M. Williams², R. A. Bloomfield¹, Jenny Huo¹, Eli E. Cronin¹, Cheyanne Walker-Williams¹, and Steven A. Williams^{1,3}

¹Dept. of Biological Sciences, Smith College, Northampton, MA, ²Dept. of Biological Sciences, Fordham University, New York, NY, ³Program in Molecular and Cellular Biology, UMass Amherst, Amherst, MA

29. Analyses of germline/soma distinctions allows for species delineation among four diverse ciliates species

Yurui Wang, Ying Yan, Laura A. Katz

Dept. of Biological Sciences, Smith College, Northampton, MA

30. Preliminary analyses in potential bacterial symbionts in free-living protists using single-cell 'omics

Adena Collens¹, Ying Yan¹, Laura A. Katz^{1,2}

¹Smith College, Northampton, MA, ²Program in Organismic and Evolutionary Biology, UMass Amherst, Amherst, MA

31. Isolation and Characterization of Plant Based Antibacterial Molecules

Hannah Hagearty, Daniel Moriarty

Dept. of Chemistry and Biochemistry, Siena College, Loudonville, NY

32. A cell envelope protein, which facilitates lipomannan maturation in mycobacteria, is critical for cell envelope maintenance and antibiotic resistance during stress exposure

Sarah Hassan Osman, Kathryn C. Rahlwes, Yasu S. Morita

Microbiology Dept., UMass Amherst, Amherst, MA

33. A Worm's Tale: A study of microbial travels through the digestive tract of the earthworm

Alexandra Norton, Kimberly Huynh, Brian Moreno, Michael Ny, Janet Williams

Biology Dept., Elms College, Chicopee, MA

34. Genome Wide Association Study (GWAS) for antifungal sensitivity in the opportunistic pathogen *Aspergillus fumigatus*

Shu Zhao¹, Jarrod R. Frotwendel², Akira Watanabe³, John G. Gibbons⁴

¹Molecular and Cellular Biology Graduate Program, UMass Amherst, MA, ²Health Science Center, University of Tennessee, Memphis, TN, ³Division of Clinical Research, Medical Mycology Research Center, Chiba University, Chiba, Japan, ⁴Dept. of Food Science, UMass Amherst, Amherst, MA

- 35. Cranberry proanthocyanidins and various dietary oligosaccharides synergistically interact with *Lactobacillus plantarum* ATCC BAA-793**
Ezgi Özcan¹, Michelle Rozycki¹, David A. Sela^{1,2}
¹Dept. of Food Science, UMass Amherst, Amherst, MA, ²Dept. of Microbiology and Physiological Systems, UMass Medical School, Worcester, MA
- 36. Actin nucleation drives pathogenic behaviors and cell survival in a model for the “brain-eating amoeba”**
Katrina Velle, Lillian Fritz-Laylin
Biology Dept., UMass Amherst, Amherst, MA
- 37. Characterization of a *Brugia Malayi* POU-homeodomain Transcription Factor Binding to its Cognate Promoter and Throughout the Genome**
McKayla Ford¹, Nicole Frumento², Hafsa Mire³, Sophie Chertock⁴, Grace Mosley⁴, Lauren Cho¹, Hannah Snell^{4,5}, Sanna Muhammad⁴, Steven Williams^{1,4}
¹Dept. of Biological Sciences, Smith College, Northampton, MA, ²Cellular and Molecular Medicine Graduate Program, Johns Hopkins, Baltimore, MD, ³Broad Institute & Dana-Farber Cancer Institute, Harvard University, Cambridge, MA, ⁴Biochemistry Dept., Smith College, Northampton, MA, ⁵Statistical and Data Sciences Dept., Smith College, Northampton, MA
- 38. A Target Genome-wide Approach to Elucidate Biofilm Formation and Antibiotic Resistance Genes and Investigate Their Genetic Interactions**
Stephanie N. Call, Lauren B. Andrews
Chemical Engineering Dept., UMass Amherst, Amherst, MA
- 39. Structural and Functional Characterization of the Interaction Between the Protease Chaperone ClpC and a Putative Sporulation-Specific Adaptor Protein**
Celia Slater¹ and Xinyue Wang¹, Sé Ferrell¹, Nicola Evans², Rivka Isaacson², Amy Hitchcock Camp¹
¹Mount Holyoke College, South Hadley, MA, ²King's College London, London, UK
- 40. Probing the molecular mechanism of ProQ-sRNA interactions using a bacterial three-hybrid assay**
Oliver M. Stockert and Chandra M. Gravel, Smriti Pandey, Katherine E. Berry
Dept. of Chemistry and Program in Biochemistry, Mount Holyoke College, South Hadley, MA
- 41. Investigating the Role of Post-Antibiotic Molecular Events on Fluoroquinolone Persistence and Resistance Development**
Blesing Zenick, Hanna Englander
Dept. of Molecular Biology and Biophysics, UConn Health, Farmington, CT
- 42. Have your microbes and eat them too: *Drosophila* gut bacteria as fermenters and food**
Danielle Lesperance, Nichole Broderick
Dept. of Molecular and Cell Biology, University of Connecticut, Storrs, CT
- 43. Isolation, Comparison, and Identification of Bacteria Isolated from Campus Water Bottle Filler and Associated Drinking Fountain**
Philip Malm, Ann Billetz
Biology Dept., Massachusetts College of Liberal Arts, North Adams, MA
- 44. Assessing linkages between soil conditions and denitrification rates during the spring snowmelt period in Vermont**
Brittany Lancellotti¹, Carol Adair¹, Dustin Kincaid¹, Julia Perdrial², Andrew Schroth², Erin Seybold³
¹Rubenstein School of Environment and Natural Resources, University of Vermont, Burlington, VT, ²Dept. of Geology, University of Vermont, Burlington, VT, ³Kansas Geological Survey, Lawrence, KS
- 45. Investigation of Phenotypic Responses in Gram-Positive and Gram-Negative following Antifolate Treatment**
Brandon A. Byrd, Maria C. Rocha Granados, Wendy W. K. Mok
Dept. of Molecular Biology and Biophysics, University of Connecticut School of Medicine, Farmington, CT

- 46. Investigation of a *Chlamydia trachomatis* virus-like particle (VLP) vaccine candidate**
Everett Webster¹, Kathryn M. Frieze^{2,3}, Susan Core², Kyra W. Seiger¹, Hannah Knopp-Broas¹, Sarah Afzaal¹, Michael Starnbach⁴, Bryce Chackerian², Rebecca S. Lijek¹
¹Dept. of Biological Sciences, Mount Holyoke College, South Hadley, MA, ²School of Medicine, Dept. of Molecular Genetics and Microbiology, University of New Mexico Health Sciences, Albuquerque, NM, ³Clinical and Translational Science Center, University of New Mexico Health Sciences, Albuquerque, NM, ⁴Dept. of Microbiology and Immunology, Harvard Medical School, Boston, MA
- 47. Drug-resistant *Candida albicans* biofilms are susceptible to killing by medium-chain fatty acids**
Kyle Brugmann, John Dinelli, Abraham Rehman, and Kearney T.W. Gunsalus
Dept. of Biology, Siena College, Loudonville, NY
- 48. Investigation of RNA Secondary Structure Involved in Escape from Viral Nuclease Cleavage**
Jacob Miles¹, Isiaha Price², Joanna Sztuba-Solinska³, Mandy Muller¹
¹Microbiology Dept., UMass Amherst, Amherst, MA, ²Amherst College, Amherst, MA, ³Dept. of Biological Science, Auburn University, Auburn, AL
- 49. An Algorithmic Approach to Program Sequential Logic in Probiotic Bacterial Strains for *In Vivo* diagnostics**
Matthew Lebovich, Lauren Andrews
Chemical Engineering Dept., UMass Amherst, Amherst, MA
- 50. Controlling the developmental switch between a human-like to a yeast-like cell in a chytrid fungus**
Kristyn Robinson, Sarah M. Prostack, Lillian K. Fritz-Laylin
Biology Dept., UMass Amherst, Amherst, MA
- 51. High-throughput Sequencing for Arcellinida Identification and Theories of Distribution**
Clara Slesar¹, Agnes K.M. Weiner¹, Robin Sleith¹, Laura Katz^{1,2}
¹Dept. of Biological Sciences, Smith College, Northampton, MA, ²Program in Organismic and Evolutionary Biology, UMass Amherst, Amherst, MA
- 52. Detection of genetic regulators of acetyl-CoA synthetase expression in *Vibrio fischeri* grown in a host-relevant carbon source**
Samuel J. Grondin, Samantha Liu, Kyra Raines, Anna Buford, Danielle Zimmer, Abigail Mesfin, Glycerol Screen Team, Cecilia Prado, and Alexandra E. Purdy
Dept., of Biology, Amherst College, Amherst, MA
- 53. Exploring the role of low molecular weight metabolites in the formation of host brain lesions during *C. neoformans* infection**
Mrinalini Ghoshal, Barry Goodell
Microbiology Dept., UMass Amherst, Amherst, MA
- 54. Impact of commensal bacteria exoproducts on *Staphylococcus aureus* antibiotic persistence**
Maria Consuelo Rocha Granados¹, Alyssa J. Matz², Brandon Byrd¹, Wendy W. K. Mok¹
¹Dept. of Molecular Biology and Biophysics, University of Connecticut Health Center, Farmington, CT, ²Biomedical Science Graduate Program, University of Connecticut Health Center, Farmington, CT
- 55. Getting the message: expansion of a bacterial three-hybrid assay to mRNA-protein interactions**
Hannah LeBlanc¹, Katherine E. Berry^{1,2}
¹Program in Biochemistry, ²Dept. of Chemistry, Mount Holyoke College, South Hadley, MA
- 56. The Role of ORF20 in KSHV Lytic Replication**
Danielle Hoffman, Kim Wojeck, Mandy Muller
Microbiology Dept., UMass Amherst, Amherst, MA
- 57. Model-Guided Metabolic Engineering of Porphyrin Utilization in Gut Microbial Communities**
Margaret Dreishpoon^{1,2}, Nathaniel Howitz¹, Lauren B. Andrews¹
¹Chemical Engineering Dept., ²Microbiology Dept., UMass Amherst, Amherst, MA

58. Pigment secretion in a laboratory-adapted strain of *Bacillus subtilis*

Edwin Premchan, Daniel Andrade, Steve Deyrup, Anna McLoon
Dept. of Biology, Siena College, Loudonville, NY

59. Design and Optimization of a Quantitative PCR Assay for the Diagnosis of Ross River Virus: Mosquito Xenomonitoring of Samoa and American Samoa Mosquito Samples

Elise Snoey, Hannah Wang, Sophia Chertock, Bethlehem Yigzaw, Rebecca A. Kuzma, Andrew Gonzalez, Jessica R. Grant, Nils Pilotte, Steven A. Williams
Dept. of Biological Sciences, Smith College, Northampton, MA

60. Decreased biofilm complexity and reduced motility in laboratory adapted strains of *Bacillus subtilis*

Amanda Buck, Jessica Buck, Shianne Johnson, and Anna McLoon
Dept. of Biology, Siena College, Loudonville, NY

61. Piecing together a function: Mutational analysis of C19ORF66, a suppressor of KSHV Reactivation

Deirdre Keane, William Rodriguez, Mandy Muller
Microbiology Dept., UMass Amherst, Amherst, MA

62. Fats vs. Fungi: Susceptibility of *Candida auris* to medium chain fatty acids

Kalynne R. Green¹, Magdia De Jesus², Kearney T. W. Gunsalus¹

¹Dept. of Biology, Siena College, Loudonville, NY, ²Department of Biomedical Sciences, University at Albany, and Division of Infectious Diseases, Wadsworth Center, New York State Department of Health

Melissa Shinfuku, Carolyn Anderson, RoseAnn Vik, Alam Garcia Heredia, Caralyn Sein, Katherine Chacon-Vargas, Malavika Prithviraj, Rebecca Gordon, Rabindra Thakur, Rachel Bell

Grad Student Committee

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We would like to thank our sponsors and the microbial community of the Happy Valley.
We are Valley Microbes.

