

Monday Program

8:15AM **Opening Remarks by** Virginia Weis, 9th ISS Congress Organizer CH2M HILL Alumni Center Ballroom

8:30AM–10:00AM Session 1 CH2M HILL Alumni Center Ballroom

Ecology of symbioses I

Chair: Elizabeth Arnold

8:30AM	1–1	Kennedy, P. ; University of Minnesota	Interguild fungal interactions and carbon cycling in forest soils
9:00AM	1–2	Ridout, M. , Newcombe, G., Schroeder, K.L.; University of Idaho	Seed endophytes of wheat have priority effects for both host symbionts and pathogens
9:15AM	1–3	Gray, L. ¹ , Kernaghan, G. ² ; Saint Mary's University ¹ , Mount Saint Vincent University ²	Fungal succession during the decomposition of ectomycorrhizal fine roots
9:30AM	1–4	Dubilier, N. ; Max Planck Institute for Marine Microbiology	Why diversity matters: Symbiont heterogeneity provides multiple benefits to deep-sea mussels from hydrothermal vents
9:45AM	1–5	Sharp, K. ¹ , Pratte, Z. ² , Kerwin, A. ³ , Rotjan, R. ⁴ , Stewart, F. ² ; Roger Williams University ¹ , Georgia Institute of Technology ² , Pennsylvania State University ³ , Boston University ⁴	Using temporal and environmental patterns in the diversity and composition of the <i>Astrangia poculata</i> microbiome to identify drivers of coral microbiome assembly

10:00AM–10:30AM Coffee Break The LaSells Stewart Center

10:30AM–12:00PM Session 2 CH2M HILL Alumni Center Ballroom

Ecology of symbioses II

Chair: Amanda Brown

10:30AM	2–1	Spribille, T. ; University of Alberta	Lichen symbiosis 2.0: The emergence of architecture
11:00AM	2–2	Vančurová, L. ¹ , Kalníková, V. ² , Peksa, O. ³ , Vaiglová, Z. ¹ , Malíček, J. ⁴ , Škaloud, P. ¹ ; Charles University ¹ , Masaryk University ² , The West Bohemian Museum in Pilsen ³ , The Czech Academy of Sciences ⁴	Photobionts of the lichens growing on the river gravel bars – symbiosis on the border of wet/dry habitats
11:15AM	2–3	Anderson, K.E. ; USDA–ARS, University of Arizona	Immortal queen microbiota: Aging in a social insect model (<i>Apis mellifera</i>)
11:30AM	2–4	Wendlandt, C. , Sachs, J.; University of California, Riverside	Host and symbiont contributions to nodule occupancy in the legume–rhizobium symbiosis
11:45PM	2–5	Engl, T. ¹ , Eberl, N. ² , Gorse, C. ² , Krueger, T. ² , Schmidt, T. ¹ , Plarre, R. ³ , Adler, C. ⁴ , Kaltenpoth, M. ¹ ; Johannes Gutenberg–University Mainz ¹ , MPI for Chemical Ecology ² , BAM Berlin ³ , JKI Berlin ⁴	Ancient symbiosis confers desiccation resistance to stored grain pest beetles

12:00PM–1:30PM	Lunch Break	Patio
1:30PM–4:00PM	Session 3	CH2M HILL Alumni Center Ballroom

***Symbiodinium*–host interactions during stress**

Chairs: Anthony Bellantuano, John Parkinson

1:30PM	3–1	Bellantuono, A.J. ¹ , Dougan, K.E. ¹ , Granados–Cifuentes, C. ^{1,2} , Rodriguez–Lanetty, M. ¹ ; Florida International University ¹ , Baruch College ²	Not a silent partner: The transcriptomic response of <i>Symbiodinium trenchii</i> in symbiosis and dysbiosis
1:45PM	3–2	Cleves, P.A. ¹ , Krediet, C.J. ¹ , Lehnert, E.M. ¹ , Mason, B.M. ¹ , Strader, M.E. ² , Matz, M.V. ² , Bay, L.K. ³ , Pringle, J.R. ¹ ; Stanford University ¹ , The University of Texas at Austin ² , Australian Institute of Marine Science ³ ,	Using transcriptomics and reverse genetics to understand mechanisms of cnidarian–dinoflagellate symbiosis
2:00PM	3–3	Merselis, D.G. ¹ , Lirman, D. ² , Rodriguez–Lanetty, M. ¹ ; Florida International University ¹ , University of Miami ²	Symbiotic immuno–suppression: Is disease susceptibility the price of bleaching resistance?
2:15PM	3–4	Mansfield, K. ¹ , Carter, N. ¹ , Cleves, P.A. ¹ , Van Vlack, E. ¹ , Pedroza, M. ¹ , Weis, V.M. ² , Sigger, T.W. ¹ , Gilmore, T.D. ¹ ; Boston University ¹ , Oregon State University ²	Immunity transcription factor NF–κB is modulated by symbiotic status in <i>Aiptasia</i>
2:30PM	3–5	Gegner, H. ¹ , Ochsenkühn, M. ² , Rädercker, N. ¹ , Barreto, M. ¹ , Voolstra, C.R. ¹ ; King Abdullah University of Science and Technology ¹ , New York University Abu Dhabi ²	Linking osmoadaptation to bleaching: High salinity conveys thermotolerance in the coral model <i>Aiptasia</i>
2:45PM	3–6	Jiang, L. , Huang, H.; Chinese Academy of Sciences	Influence of ocean warming and acidification on the symbiosis establishment and early stages of two broadcast spawning corals
3:00PM	3–7	Rodriguez–Casariego, J. ¹ , Ladd, M. ² , Shantz, A. ² , Lopez, C. ¹ , Cheema, M.S. ³ , Kim, B. ³ , Roberts, S. ⁴ , Fourqurean, J. ¹ , Ausio, J. ³ , Burkepille, D. ² , Eirin–Lopez, J. ¹ ; Florida International University ¹ , University of California, Santa Barbara ² , University of Victoria ³ , University of Washington ⁴	Nutrient loading hinders mechanisms involved in the epigenetic maintenance of genome integrity in the stony coral <i>Acropora cervicornis</i>

3:15PM–3:45PM	Coffee Break	The LaSells Stewart Center
---------------	--------------	----------------------------

3:45PM	3–8	Ramah, S. ¹ , Taleb–Hossenkhan, N. ¹ , Todd, P.A. ² , Bhagooli, R. ¹ ; University of Mauritius ¹ , National University of Singapore ²	The susceptibility of two giant clam species and their <i>Symbiodinium</i> to thermal stresses
4:00PM	3–9	Cziesielski, M. , Liew, Y.J., Cui, G., Aranda, M.; King Abdullah University of Science and Technology	Investigating cnidarian host–symbiont relations and metabolic compatibility during thermal stress

Monday Program (*continued*)

1:30PM–3:15PM **Session 4** **The LaSells Stewart Center, Construction and Engineering Hall**

Bacterial–host interactions

Chairs: Mélisandre Téfit, Erika Díaz–Almeyda

1:30PM	4–1	Téfit, M. , Corley, M., Belcaid, M., Ruby, E., Maunakea, A., McFall–Ngai, M.; University of Hawai'i at Mānoa	Symbiont–induced epigenetic changes in the host genome during the initiation of the squid–vibrio partnership
1:45PM	4–2	Ingham, C.S. , Engl, T., Kaltenpoth, M.; Johannes Gutenberg–University Mainz	Phylogenetic distribution of NO resistance as a driver of host–symbiont specificity in a protective mutualism
2:00PM	4–3	Öztürk, R. ; Selçuk University	Near environment of insects
2:15PM	4–4	Suria, A. , Nyholm, S.V.; University of Connecticut	Insights into Hawaiian bobtail squid egg defense from metagenomic and metatranscriptomic analyses of the female reproductive system symbiotic community
2:30PM	4–5	Díaz–Almeyda, E. ¹ , Griffin, L. ² , de Man, T. ³ , Gerardo, N. ¹ ; Emory University ¹ , Hayes Inc. ² , Centers for Disease Control and Prevention ³	Effect of presence/absence of obligate symbionts in Kudzu bugs
2:45PM	4–6	Nelson, J. , Hauser, D., Li, F.W.; Boyce Thompson Institute	Exploring bryophyte microbiomes: New insights from next generation amplicon sequencing in liverwort and hornwort hosts
3:00PM	4–7	Stagaman, K. ¹ , Flannery, J.E. ² , Hickey, R.J. ³ , Burns, A.R. ⁴ , Fisher, P.A. ² , Sharpton, T.J. ¹ ; Oregon State University ¹ , University of Oregon ² , Phylagen ³ , Stanford University ⁴	A metagenomic examination of the gut microbiome's association with SES, parenting, and child behavior

3:15PM–3:45PM Coffee Break The LaSells Stewart Center

4:15PM–5:30PM **Session 5** **CH2M HILL Alumni Center Ballroom**

Fungal–algal interactions: Lichens

Chair: Toby Spribille

4:15PM	5–1	Leavitt, S. , Wright, B.; Brigham Young University	How many fungi and algae does it take to make a lichen? Looking beyond simple two–partner system
4:30PM	5–2	Tuovenin, V. ¹ , Ekman, S. ² , Thor, G. ³ , Spribille, T. ¹ , Johannesson, H. ² ; University of Alberta ¹ , Uppsala University ² , Swedish University of Agricultural Sciences ³	Yeasts in the cortex of <i>Letharia</i> lichens
4:45PM	5–3	Doni, F. ¹ , Zain, C.R.C.M. ¹ , Uphoff, N. ² , Isahak, A. ³ , Yusoff, W.M.W. ³ ; The National University of Malaysia ¹ , Cornell University ² , Malaysian Agroecology Society ³	Transcriptomic profiling of rice seedlings inoculated with symbiotic fungus <i>Trichoderma asperellum</i> SL2
5:00PM	5–4	Ruprecht, U. , Junker, R.R.; University of Salzburg	Climate niche expansion due to generalization in species associations in lichens
5:15PM	5–5	Akgül, H.E. , Öztürk, C.; Selçuk University	Thallus morphology of cyanolichens

Bacterial–coral interactions

Chairs: Rebecca Vega–Thurber, Christian Voolstra

3:45PM–4:00PM		Coffee Break Extension	
4:00PM	6–1	Klinges, J.G. ¹ , Rosales, S.M. ² , McMinds, R. ¹ , Shaver, E.C. ³ , Shantz, A.A. ⁴ , Peters, E. ⁵ , Burkepille, D.E. ⁴ , Silliman, B. ³ , Muller, E. ⁶ , Vega–Thurber, R. ¹ ; Oregon State University ¹ , National Oceanic and Atmospheric Administration ² , Duke University ³ , University of California, Santa Barbara ⁴ , George Mason University ⁵ , Mote Marine Laboratory and Aquarium ⁶	<i>Wolbachia</i> of the sea: Newly discovered coral parasite <i>Candidatus Marinoinvertebrata rohwerii</i> provides an ideal model to test dynamic shifts from mutualism to parasitism in response to nutrient pollution
4:15PM	6–2	Cárdenas, A. ¹ , Raina, J.B. ² , Voolstra, C.R. ¹ ; King Abdullah University of Science and Technology ¹ , University of Technology ²	First functional insights into coral–associated bacteria belonging to the Roseobacter clade
4:30PM	6–3	Ciarello, M. ¹ , Auguet, J.C. ² , Claverie, T. ³ , Sucré, E. ³ , Bouvier, C. ² , Rilleuvineuve, F. ⁴ , Graham, N. ⁵ , Bettarel, Y. ² , Villéger, S. ² , Bouvier, T. ² ; University of Toulouse ¹ , French National Center for Scientific Research ² , Centre Universitaire de Formation et de Recherche de Mayotte ³ , University of Montpellier ⁴ , Lancaster University ⁵ ,	Macroscopic biodiversity of coral reefs supports a high, unique and vulnerable microscopic biodiversity
4:45PM	6–4	Maher, R. ¹ , Rice, M. ² , Burkepille, D. ² , Vega–Thurber, R. ¹ ; Oregon State University ¹ , University of California, Santa Barbara ²	Local and global stressors interact antagonistically to destabilize the coral microbiome
5:00PM	6–5	Pogoreutz, C. , Rådecker, N., Cárdenas, A., Ngugi, D.K., Voolstra, C.R.; King Abdullah University of Science and Technology	Exploring the functional relationship of the coral– <i>Endozoicomonas</i> association
5:15PM	6–6	Hartman, L.M. ^{1,2} , van Oppen, M.J.H. ^{2,3} , Blackall, L.L. ² ; Swinburne University of Technology ¹ , The University of Melbourne ² , Australian Institute of Marine Science ³	The microbiome of Great Barrier Reef sourced <i>Exaiptasia pallida</i>

Keynote Lecture

Ed Yong – I Contain Multitudes: Telling Stories About Microbes and the People who Study Them

Tuesday Program

8:30AM–10:00AM Session 7 CH2M HILL Alumni Center Ballroom

Susceptibility and resilience of symbioses in the Anthropocene

Chair: Simon Davy

- | | | | |
|--------|-----|--|---|
| 8:30AM | 7-1 | Vega-Thurber, R. ¹ , Medina, M. ² , Zaneveld, J. ³ , McMinds, R. ¹ , Pollack, J. ² ; Oregon State University ¹ , Pennsylvania State University ² , University of Washington Bothell ³ | The Global Coral Microbiome Project: Investigations on scleractinian microbial diversity, phylosymbiosis, and holobiont dysbiosis |
| 9:00AM | 7-2 | Williams, S. ; Northeastern University | Resistance and robustness of the global coral-symbiont network |
| 9:15AM | 7-3 | Chakravarti, L. ^{1,2} , van Oppen, M.J.H. ^{1,3} ; Australian Institute of Marine Science ¹ , James Cook University ² , University of Melbourne ³ | Experimental evolution in coral photosymbionts |
| 9:30AM | 7-4 | Doty, S.L. ¹ , Joubert, P.M. ¹ , Rho, H. ¹ , Sher, A. ² , Tournay, R. ¹ , Parikh, S. ¹ , Joseph, M. ¹ , Firrincieli, A. ³ , Khan, Z. ¹ , Kim, S.H. ¹ ; University of Washington ¹ , University of California, San Diego ² , University of Tuscia ³ | Using plant-microbe symbiosis to increase resilience to environmental challenge |
| 9:45AM | 7-5 | Rädecker, N. ¹ , Pogoreutz, C. ¹ , Gegner, H. ¹ , Wild, C. ² , Voolstra, C.R. ¹ ; King Abdullah University of Science and Technology ¹ , University of Bremen ² | Linking coral bleaching to holobiont nutrient cycling |

10:00AM–10:30AM Coffee Break The LaSells Stewart Center

10:30AM–12:00PM Session 8 CH2M HILL Alumni Center Ballroom

Tinkering with symbiosis: Experimental insights into host-symbiont systems

Chair: Posy Busby

- | | | | |
|---------|-----|--|---|
| 10:30AM | 8-1 | Arnold, A.E. ; University of Arizona | Mosaics, megabases, and matryoshki: A leaf-to-landscape perspective on the symbiotic renaissance |
| 11:00AM | 8-2 | Chen, C.S. ¹ , Chen, H.K. ¹ , Wang, L.H. ¹ , Chen, W.N.U. ² , Rosset, S. ¹ , Chen, Y.J. ¹ ; National Museum of Marine Biology and Aquarium ¹ , I-Shou University ² | The critical role of host endoplasmic reticulum in lipid body biogenesis and the regulation of the coral- <i>Symbiodinium</i> endosymbiosis |
| 11:15AM | 8-3 | Flórez, L. ¹ , Scherlach, K. ² , Gaube, P. ³ , Miller, I. ⁴ , Kwan, J. ⁴ , Hertweck, C. ² , Kaltenpoth, M. ¹ ; Johannes Gutenberg University, Mainz ¹ , Leibniz Institute for Natural Products Research and Infection Biology ² , University of Würzburg ³ , University of Wisconsin ⁴ , | The hitchhiker's guide to symbiosis: Evolution of a beetle's defensive mutualists from plant pathogens |
| 11:30AM | 8-4 | McAnulty, S.J. , Nyholm, S.V.; University of Connecticut | Catch and release: Differential hemocyte binding in the squid-vibrio symbiosis |
| 11:45AM | 8-5 | Clear, M. , Hom, E.; University of Mississippi | Exploring the capacity of fungi and algae to form mutualisms through "microbial matchmaking" |

12:00PM–1:30PM Lunch break Patio

1:30PM–2:15PM **Session 9** **CH2M HILL Alumni Center Ballroom**

Virus–host interactions

Chair: Juris Grasis

1:30PM	9–1	Roossinck, M. ; Pennsylvania State University	Plants, fungi and viruses: Multiplexed symbioses and their impacts on viral evolution
1:45PM	9–2	Lindsey, A. , Bhattacharya, T., Hardy, R., Newton, I.; Indiana University	Determining the mechanism of <i>Wolbachia</i> –mediated pathogen blocking
2:00PM	9–3	Grasis, J. ; University of California, Merced	Holobiont–virome interactions in the basal metazoan <i>Hydra</i>

2:15PM–2:30PM Break

1:30PM–3:00PM **Session 10** **The LaSells Stewart Center, Construction and Engineering Hall**

Fungal–host interactions: Arbuscular mycorrhizae

Chairs: Manju Gupta, Oksana Shtark

1:30PM	10–1	Sharma, M.P. , Agnihotri, R., Bharti, A., Pandey, A., Maheshwari, H., Ramesh, A., Billore, S.D.; Indian Institute of Soybean Research	Enhanced production of native AM fungi in mixture of soybean processing mill waste and organic amendments assessed through AM–signature fatty acids
1:45PM	10–2	Gupta, M.M. ; University of Delhi	Biodiversity of arbuscular mycorrhizal fungi as affected by human intervention
2:00PM	10–3	Akoto, O. ; Jatropa Africa Ltd	The mycorrhizal status of indigenous arbuscular mycorrhizal fungi of <i>Jatropha curcas</i> in Ghana
2:15PM	10–4	Guienel, F.C. ¹ , Goh, D. ¹ , Farah, Z.S.M. ¹ , Mulholland, S. ¹ , Spichal, L. ² ; Wilfred Laurier University ¹ , Palacký University ²	Cytokinins promote the development of mycorrhizae in pea
2:30PM	10–5	Shtark, O. ¹ , Avdeeva, G. ² , Puzanskiy, R. ² , Kliukova, M. ¹ , Yurkov, A. ¹ , Zhukov, V. ¹ , Shishova, M. ² ; All–Russia Research Institute for Agricultural Microbiology ¹ , St. Petersburg State University ²	Physiological and biochemical responses of pea to inoculation with the arbuscular mycorrhizal fungus <i>Rhizophagus irregularis</i>
2:45PM	10–6	Kokkoris, V. , Miles, T., Hart, M.; University of British Columbia	Asymbiotic and symbiotic trait variance in <i>Rhizoglyphus irregularis</i> : Is <i>in vitro</i> propagation decreasing intra–isolate variation and producing more ruderal isolates?

3:00PM–3:45PM Coffee Break

The LaSells Stewart Center

Tuesday Program (*continued*)

2:30PM–5:15PM		Session 11	CH2M HILL Alumni Center Ballroom
New approaches to the study of protist–cnidarian symbioses			
<i>Chairs: Clinton Oakley, Manuel Aranda</i>			
2:30PM	11–1	Li, Y., Liew, Y.J., Cui, G., Czielski, M.J., Zahran, N., Michell, C.G., Aranda, M. ; King Abdullah University of Science and Technology	DNA methylation regulates transcriptional homeostasis of algal endosymbiosis in the coral model <i>Aiptasia</i>
2:45PM	11–2	Oakley, C. ¹ , Sproles, A. ¹ , Matthews, J. ¹ , Peng, L. ¹ , Grossman, A. ² , Weis, V.M. ³ , Davy, S.K. ¹ ; Victoria University of Wellington ¹ , Carnegie Institution of Science ² , Oregon State University ³	Proteomics reveals nutrient exchange mechanisms altered by a novel cnidarian– <i>Symbiodinium</i> symbiosis
3:00PM	11–3	Maruyama, S. , Mandelare, P.E., Loesgen, S., Weis, V.M.; Oregon State University	The role of the symbiont glycome in colonization of cnidarian host, <i>Aiptasia</i> , by heat stressed <i>Symbiodinium minutum</i>
3:15PM–3:45PM		Coffee Break	The LaSells Stewart Center
3:45PM	11–4	Kitchen, S.A. ¹ , Poole, A.Z. ² , Donskaya, S. ¹ , Piorkowski, S.B. ¹ , Medina, M. ¹ , Ohdera, A.K. ¹ ; Pennsylvania State University ¹ , Berry College ²	Inhibition of sphingosine kinase reduces symbiont colonization in two symbiotic model cnidarians, sea anemone <i>Exaiptasia pallida</i> and jellyfish <i>Cassiopea xamachana</i>
4:00PM	11–5	Fuess, L.E. ¹ , Palacio, A. ² , Butler, C.C. ¹ , Brandt, M.E. ³ , Baker, A.C. ⁴ , Mydlarz, L. ¹ ; University of Texas at Arlington ¹ , University of Miami ² , University of the Virgin Islands ³ , University of Miami ⁴	A multi–experiment approach to investigate the relationship between symbiosis, immunity, and the transforming growth factor–beta pathway in a Caribbean coral, <i>Orbicella faveolata</i>
4:15PM	11–6	Gorman, L. ¹ , Weis, V.M. ² , Davy, S.K. ¹ ; Victoria University of Wellington ¹ , Oregon State University ²	The evolution and diversity of key cell cycle progression proteins across different <i>Symbiodinium</i> clades
4:30PM	11–7	Cui, G. ¹ , Liew, Y.J. ¹ , Li, Y. ¹ , Kharbatia, N. ¹ , Zahran, N.I. ¹ , Emwas, A.H. ¹ , Eguiluz, V.M. ² , Aranda, M. ¹ ; King Abdullah University of Science and Technology ¹ , Instituto de Física Interdisciplinar y Sistemas Complejos ²	Meta–analysis reveals host–dependent nitrogen recycling as a mechanism of symbiont control in <i>Aiptasia</i>
4:45PM	11–8	Dougan, K. , Suarez, R., Rodriguez–Lanetty, M.; Florida International University	Characterizing the diversity and expression of insulin–like peptides and their receptor in cnidarian–algal symbioses
5:00PM	11–9	Baumgarten, S. ^{1,2} , Mariappan, K.G. ¹ , Yuyama, I. ³ , Pringle, J.R. ⁴ , Aranda, M. ¹ , Voolstra, C.R. ¹ ; King Abdullah University of Science and Technology ¹ , Institut Pasteur ² , University of Tsukuba ³ , Stanford University ⁴	Evidence for miRNA–mediated modulation of the symbiont and host transcriptome in cnidarian–dinoflagellate symbiosis
5:15PM	Break		

3:45PM–5:15PM

Session 12

The LaSells Stewart Center, Construction and Engineering Hall

Bacterial–insect interactions

Chair: Martin Kaltenpoth

3:45PM	12–1	Sheehan, K.B., Martin, M., Rice, D., Newton, I.L.G. ; Indiana University	How does a symbiont manipulate host biology?
4:00PM	12–2	Nadal–Jimenez, P. , Darby, A., Hinton, J., Hurst, G.; University of Liverpool	Unraveling the molecular mechanisms of symbiosis and male killing in an insect endosymbiont
4:15PM	12–3	Ohbayashi, T. ^{1,2} , Futahashi, R. ³ , Shigenobu, S. ⁴ , Fukatsu, T. ³ , Mergaert, P. ¹ , Kikuchi, Y. ^{2,3} ; French National Center for Scientific Research ¹ , Hokkaido University ² , National Institute of Advanced Industrial Science and Technology ³ , National Institute for Basic Biology ⁴	Comparative cytology, physiology and transcriptomics between free–living and symbiotic <i>Burkholderia</i> symbionts reveal adaptations for colonization of its bean bug host
4:30PM	12–4	Mao, M. , Yang, A., Bennett, G.; University of California, Merced	Tailored host adaptation to support two ancient bacterial symbionts with differentially degraded genomes in a leafhopper host
4:45PM	12–5	Maire, J. ¹ , Vincent–Monégat, C. ¹ , Balman, S. ¹ , Vallier, A. ¹ , Hervé, M. ² , Anselme, C. ¹ , Masson, F. ¹ , Vignerot, A. ¹ , Perrin, J. ³ , Parisot, N. ¹ , Orleans, J. ¹ , Fauvarque, M.O. ³ , Mengin–Lecreulx, D. ³ , Zaidman–Rémy, A. ¹ , Heddi, A. ¹ ; University of Lyon ¹ , Institute of Integrative Biology of the Cell ² , Université Grenoble Alpes ³	Immune regulations and functions favor host homeostasis in insect endosymbiosis
5:00PM	12–6	Rio, R.V.M. ¹ , Snyder, A.K. ² , Pollio, A.R. ¹ , Vignerot, A. ³ , Weiss, B.L. ³ ; West Virginia University ¹ , Goucher College ² , Yale University ³	Symbiont resource allocation impacts vector competency
5:15PM		Break	

5:30PM–7:30PM

Poster Session

The LaSells Stewart Center

Bacterial–host interactions

P–1	Bublitz, D. ¹ , Łukasik, P. ¹ , Meister, R. ² , Matsuura, Y. ³ , Simon, C. ² , McCutcheon, J. ¹ ; University of Montana ¹ , University of Connecticut ² , University of Ryukyus ³	Widespread genomic instability in the ancient endosymbiont of cicadas
P–2	Campbell, M. ¹ , Łukasik, P. ¹ , Meyer, M. ¹ , Buckner, M. ¹ , Michalik, A. ² , Simon, C. ³ , McCutcheon, J. ¹ ; University of Montana ¹ , Jagiellonian University ² , University of Connecticut ³	Endosymbiont degradation drives a host adaptation

Tuesday Program (*continued*)

P-3	Drew, G. ¹ , Budge, G. ² , Hurst, G.; University of Liverpool, Food and Environment Research Agency	Localisation and transmission of a common symbiont in a eusocial host
P-4	Kupper, M. ¹ , Gross, R. ² , McCutcheon, J. ¹ ; University of Montana, University of Wuerzburg	Transmission of intracellular bacterial endosymbionts in two insect species from the orders Hymenoptera and Hemiptera
P-5	Parish, A. , Smith, E., Miller, K., Newton, I.L.G.; Indiana University	Comparative transcriptomics of microbial communities within <i>Apis mellifera</i> queens
P-6	Rodre, A.C., Stock, S.P. ; The University of Arizona	Effect of <i>Xenorhabdus</i> symbionts on postembryonic development and pheromone production of their <i>Steinernema</i> hosts
P-7	Wasala, S. ¹ , Brown, A.M.V. ² , Peetz, A.B. ³ , Howe, D.K. ¹ , Zasada, I.A. ³ , Denver, D.R. ¹ ; Oregon State University ¹ , Texas Tech University ² , USDA-ARS Horticultural Crops Research Laboratory ³	New insights into symbiosis between <i>Wolbachia</i> and plant-parasitic nematodes
P-8	Sawyer, S. , Wentzel, M.; Glenville State College	The <i>Wolbachia</i> infection frequency of insects in central West Virginia
P-9	Bonneau, M. ¹ , Atyame, C. ² , Weill, M. ¹ , Sicard, M. ¹ ; Institut des Sciences de l'Évolution de Montpellier ¹ , University of La Réunion ²	Towards the cytological mechanisms and the genetic determinism of the high diversity of cytoplasmic incompatibility induced by <i>Wolbachia</i> in the mosquito <i>Culex pipiens</i>
P-10	Singh, R. , Linksvayer, T.A.; University of Pennsylvania	Effects of <i>Wolbachia</i> on social traits and fitness in pharaoh ants
P-11	Sandoval-Calderon, M. ¹ , Nechitaylo, T. ² , Kaltenpoth, M. ^{1,2} ; Johannes Gutenberg University Mainz, Max Planck Institute for Chemical Ecology	Genomic stability and erosion in ' <i>Streptomyces philanthi</i> ', the beewolf defensive symbiont
P-12	Higareda Alvear, V.M. ¹ , Martínez-Romero, E. ¹ , Mateos, M. ² ; National Autonomous University of Mexico ¹ , Texas A&M University ²	Transcriptomic response of <i>Spiroplasma</i> to parasitic wasp attack in <i>Drosophila melanogaster</i>
P-13	García-Santibañez, T. , Martínez-Romero, E., Mónica, R.; National Autonomous University of Mexico	Bacteria associated with the venom gland of the scorpion <i>Vaejovis smithi</i>
P-14	Mahalingam, S. , Dharumadurai, D., Archunan, G.; Bharathidasan University	A metagenomic approach to characterization of buffalo vaginal microbial genetic diversity and abundance in buffalo during estrous cycle
P-15	Dearden, A. , Sydnor, J., Tran C.; Chico State University	Development of axenic Aiptasia: A vital tool for cnidarian-bacteria symbiosis research
P-16	Sydnor, J. , Dearden, A., Tran, C.; California State University, Chico	The bacterial community associated with the sea anemone Aiptasia: Response to thermal stress

- P-17 **Avila, V.¹**, Kamel, B.², De Salvo, M.³, Iglesias-Prieto, R.¹, Medina, M.¹; Pennsylvania State University, University of New Mexico, University of California, Merced Distinctive gene expression profiles and bacterial communities are associated with thermal tolerance in Caribbean coral holobionts
- P-18 **Latour, J.¹**, Bernier, S.B.², Doiron, K.¹, Tremblay, R.¹, Lemarchand, K.¹; Institut des Sciences de la Mer de Rimouski¹, Université du Québec à Rimouski² Protective effect of marennine as probiotic against pathogen-challenge of *Mytilus edulis* larvae in aquaculture: Role of the larvae microbiota
- P-19 **Gomez, G.**, Coate, J.; Reed College Effects of polyploidy on legume-rhizobial symbiosis
- P-20 **Padda, K.P.**, Puri, A., Chanway, C.P.; University of British Columbia Role of endophytic diazotrophic bacteria in promoting the growth of lodgepole pine trees at extremely nitrogen deficient gravel mining pits
- P-21 **Puri, A.**, Padda, K.P., Chanway, C.P.; University of British Columbia Isolation and characterization of nitrogen-fixing bacteria from the internal tissues of lodgepole pine and hybrid white spruce trees naturally regenerating in the West Chilcotin region of British Columbia, Canada
- P-22 **Matthiadis, A.¹**, Bible, A.N.², Morrell-Falvey, J.L.¹, Kalluri, U.C.¹; Oak Ridge National Laboratory, University of Tennessee, Knoxville Involvement of auxin in the root interaction between the growth promoting bacteria *Pantoea* and the bioenergy crop *Populus*
- P-23 **Carter, M.E.**, Carpenter, S.C.D., Lastovetsky, O.A., Pawlowska, O.A., Bogdanove, A.J.; Cornell University Role of TAL effector-like proteins in *Burkholderia-Rhizopus microsporus* symbiosis

Fungal-host interactions

- P-24 **Scharnagl, K.**, Prather, A.; Michigan State University Do lichens follow the biotic interactions hypothesis? Testing partner specificity along a latitudinal gradient
- P-25 **Tagirdzhanova, G.**, Spribille, T.; University of Alberta The evolution of lichen morphology
- P-26 **Goyette, S.**, Spribille, T.; University of Alberta Fungal diversity associated with hair lichens in boreal and montane forests in Alberta
- P-27 **Autumn, K.¹**, Peña, A.B.², Huang, J.P.³, Lumbsch, T.³; Willamette University¹, National Autonomous University of Mexico², The Field Museum of Natural History³ Speciation continuum and the multi-dimensionality of biological diversification in *Xanthoparmelia* lichens
- P-28 **Frankel-Bricker, J.**, White, M.; Boise State University Merging mycology and microbial ecology: Investigating the relationship between a prominent trichomycetes fungus (*Zancudomyces culisetae*) and the gut microbiome of its mosquito host
- P-29 **Gans, M.**, Dowie, N., Miller, S.; University of Wyoming Invariant communities of nitrogen-fixing bacteria associated with *Pterospora*
- P-30 **Steinová, J.¹**, Vaiglová, Z.¹, Černajová, I.¹, Peksa, O.², Bestová, H.¹, Škaloud, P.¹; Charles University¹, Museum of West Bohemia in Pilsen² Studying the abiotic factors responsible for shaping the distribution of symbiotic partners in lichens – a case study on the genus *Cladonia*

Tuesday Program (*continued*)

- P-31 **Oita, S.**¹, U'Ren, J.M.¹, Lutzoni, F.²,
Miadlikowska, J.², Trouet, V.¹, Arnold, A.E.¹;
University of Arizona¹, Duke University² Relationships of foliar endophyte communities in *Picea mariana* to tree age, biomass, and latitude
- P-32 **Ashima**¹, Gupta, M.M.¹, Mittal, A.², Sehgal,
H.², Kumari, A.²; University of Delhi¹, Amity
University² Impact of invader species, *Lantana camara* on diversity
of arbuscular mycorrhizal fungi
- P-33 **Rowe, S.**, Shachar-Hill, Y.; Michigan State
University Nitrogen uptake preferences in the legume arbuscular
mycorrhizae symbiosis
- P-34 **Unruh, S.**¹, Zettler, L.², Stajich, J.³, Perotto,
S.⁴, Martin, F.⁵, Conant, G.⁶, Hudson, C.⁷,
Pires, J.C.¹; University of Missouri¹, Illinois
College², University of California, Riverside³,
University of Turin⁴, French National Institute
for Agricultural Research at Nancy⁵, North
Carolina State University⁶, Sandia National
Laboratories⁷ Genomics of orchid mycorrhizal fungi
- P-35 **Bowman, E.**, Arnold, A.E.; University of Arizona Ectomycorrhizal and foliar endophytic fungal
communities of *Pinus ponderosa* in an anciently
fragmented forest
- P-36 **Pande, V.**, Panward, A.; Kumaun University Genetic diversity analysis of ectomycorrhizal fungi
associated with *Quercus leucocotrichophora* (Oak) from
Kumaun Himalayan region of India
- P-37 Lefait, A.¹, **Kernaghan, G.**²; Saint Mary's
University¹, Mount Saint Vincent University² Fungal species selection in ectomycorrhizal grazing by
Collembola
- P-38 Miller, D., Newton, I.L.G.; Indiana University Acetic acid bacteria as inhibitors of entomopathogenic
fungi

Microbe-microbe interactions

- P-39 **Keller, N.**, Venkatesh, N.; University of
Wisconsin-Madison Cross-kingdom communication between a plant
pathogenic bacterium and fungus mediates plant
disease and microbial survival
- P-40 **García-Montaner, A.**, Tamarit, D., Näslund,
K., Webster, M., Andersson, S.G.E.; Uppsala
University Genome and mobilome dynamics of *Lactobacillus
kunkei* in micropopulations of honeybees
- P-41 **Marlin, M.**, Newcombe, G.; University of Idaho Is chemical warfare more common among seed
microbes than other plant microbes?
- P-42 **Noh, S.**¹, DiSalvo, S.², Queller, D.³, Strassmann,
J.³; Colby College¹, Southern Illinois University
Edwardsville², Washington University in St.
Louis³ Hints of evolutionary history when naive social
amoebae are introduced to their facultative bacterial
symbionts
- P-43 **Brock, D.**, Shu, L., DiSalvo, S., Queller, D.C.,
Strassmann, J.E.; Washington University in St.
Louis The love/hate relationships between *Dictyostelium*
amoebae and *Burkholderia* bacteria
- P-44 **Bachy, C.**^{1,2}, Boidin-Wichlacz, C.^{1,3}, Mehiri, M.⁴,
Leroux, C.^{1,2}, Tasiemski, A.^{1,3}, Not, F.^{1,2}; French
National Center for Scientific Research¹, Pierre
and Marie Curie University², University of Lille³,
University of Nice Sophia Antipolis⁴ Characterization of the diversity and function of
plankton associated microbiota

- P-45 Meng, A.^{1,2,3,4,5}, Corre, E.⁶, Peterlongo, P.⁷, Marchet, C.⁷, Alberti, A.⁸, Da Silva, C.⁸, Wincker, P.⁸, Probert, I.⁹, Suzuki, N.¹⁰, Le Crom, S.^{1,2,3,4,5}, Bittner, L.^{1,2,3,4,5}, **Not, F.**⁹; Sorbonne University¹, Pierre and Marie Curie University², University of the French West Indies³, University of Nice Sophia Antipolis⁴, French National Center for Scientific Research⁵, Analysis and Bioinformatics for Marine Science⁶, Research Institute of Computer Science and Random Systems⁷, Genoscope⁸, Station Biologique de Roscoff⁹, Tohoku University¹⁰
- Key functions involved in the establishment and the maintenance of marine plankton symbiosis revealed by a meta-transcriptome approach

Protist–host interactions

- P-46 **Drotos, K.**¹, Smith, M.A.¹, McMullin, R.T.², Spribille, T.³, Gregory, T.R.¹; University of Guelph¹, Canadian Museum of Nature², University of Alberta³
- Many lineages, one strategy: Genome size diversity in lichens
- P-47 **Nelsen, M.**; Field Museum of Natural History
- Assessing diversity and patterns of association in one of the most widely utilized lichen photobionts
- P-48 **Kaullysing, D.**¹, Taleb–Hossenkhan, N.¹, Kulkarni, B.², Bhagooli, R.¹; University of Mauritius¹, Government Institute Of Science, Auragabad²
- Spatio-temporal distribution, density and diversity of ectoparasitic gastropods on coral hosts in a tropical island
- P-49 McCauley, M., **Goulet, T.**; University of Mississippi
- The impact of nitrogen and phosphorus enrichment on Caribbean gorgonian corals and their endosymbiotic algae, *Symbiodinium*
- P-50 **Castillo, R.**, Islas-Flores, T.I., Villanueva, M.A.; National Autonomous University of Mexico
- Changes on the phosphorylation levels of a BiP-like protein from *Symbiodinium* induced by light and temperature
- P-51 **Islas-Flores, T.I.**, Nava–Galeana, J., Pérez–Cervantes, E., Villanueva, M.A.; National Autonomous University of Mexico
- The expression of the symbiosis transducer SmicRACK1 protein is regulated by light in *Symbiodinium microadriaticum* ssp. *microadriaticum*
- P-52 **Rocha de Souza, M.**, Gates, R.D.; University of Hawai'i at Mānoa
- Spatial and temporal variation of free-living *Symbiodinium* in Kāne'ohe Bay, Hawai'i
- P-53 **Parkinson, J.E.**¹, Tivey, T.R.¹, Adpressa, D.¹, Mandelare, P.E.¹, Peng, W.², Dong, X.², Mechref, Y.², Weis, V.M.¹, Loesgen, S.¹; Oregon State University¹, Texas Tech University²
- Mass spectrometry reveals fucosylated and sialylated glycans as potential determinants of coral–dinoflagellate symbiosis specificity
- P-54 **Xiang, T.**¹, Jinkerson, R.², Clowez, S.¹, Tran, C.³, Krediet, C.J.⁴, Onishi, M., Cleves, P.A., Pringle, J.R., Grossman, A.R.¹; Carnegie Institution for Science¹, University of California, Riverside², California State University, Chico³, Eckerd College⁴, Stanford University⁵
- Glucose-induced trophic shift in an endosymbiont dinoflagellate with physiological and molecular consequences

Tuesday Program (*continued*)

P-55	Wang, L.H. , Chen, H.K., Chen, C.S.; National Museum of Marine Biology and Aquarium	The influence of host factors on <i>Symbiodinium</i> proliferation
P-56	Ling, L. ¹ , Cleves, P.A. ¹ , Krediet, C.J. ² , Pringle, J.R. ¹ ; Stanford University ¹ , Eckerd College ²	Changes in protein abundance under thermal stress in a symbiotic cnidarian
P-57	Tinoco, A. , Ling, L., Pringle, J.R.; Stanford University	Investigating chemical and cellular mechanisms of sunscreen toxicity in a symbiotic cnidarian
P-58	Coleman, T.J., Tivey, T.R. , Weis, V.M.; Oregon State University	Temporal and spatial patterns of symbiont proliferation in a cnidarian–algal symbiosis
P-59	Lapacek, V.A. ¹ , Poole, A.Z. ² , Weis, V.M. ¹ ; Oregon State University, Berry College	NADPH oxidase expression as a function of symbiotic state and heat stress in the symbiotic sea anemone <i>Aiptasia</i>
P-60	Lust, B. ¹ , Oakley, C.A. ¹ , Carbonne, C. ¹ , Gates, R.D. ² , Grossman, A.R. ³ , Weis, V.M. ⁴ , Davy, S.K. ¹ ; Victoria University of Wellington ¹ , University of Hawai'i at Mānoa ² , Stanford University ³ , Oregon State University ⁴	The influence of symbiont diversity and temperature stress on host physiology, ROS and photosynthesis in a model cnidarian
P-61	Vallen, E. , Allen–Waller, L., Ingersoll, M., Rabin, A., Sung–Clarke, S., Tillis, T.; Swarthmore College	<i>Aiptasia pallida</i> as a model for the cnidarian– <i>Symbiodinium</i> symbiosis: Development of the yeast two–hybrid system to probe protein–protein interactions
P-62	Renicke, C. , Ling, L., Cleves, P.A., Barry, O., Pringle, J.R.; Stanford University	Method development in the <i>Aiptasia</i> – <i>Symbiodinium</i> model system for cnidarian–dinoflagellate symbiosis
P-63	Carney, S. , Ellison, M., Ferrier, D.; Hood College	Salinity stress affects Hsp70 expression in the <i>Exaiptasia pallida</i> and <i>Symbiodinium</i> symbiosis
P-64	Verde, A. ; Maine Maritime Academy	The photobiology of symbiotic <i>Anthopleura elegantissima</i> (Brandt): Effects of symbiotic algae, anemone size, and season
P-65	Monges, G. , Tran, C.; California State University, Chico	Light variation in the marine environment and its effect on cnidarians and their algal symbionts

Thursday Program

8:30AM–10:00AM		Session 13	CH2M HILL Alumni Center Ballroom
The host–microbe interface: Signaling, recognition and regulation			
<i>Chair: Virginia Weis</i>			
8:30AM	13–1	McFall–Ngai, M.J. ; University of Hawai‘i at Mānoa	Waging peace: Diplomatic relations in animal–bacterial symbioses
9:00AM	13–2	Stock, S.P. , Peterson, B.F., Yousefelahi, M.; The University of Arizona	Role of bacterial symbiont and insect host on the metabolism of the <i>Steinernema carpocapsae</i> nematodes (Nematoda: Steinernematidae)
9:15AM	13–3	Tivey, T.R. , Weis, V.M.; Oregon State University	The cell cycle in the Aiptasia– <i>Symbiodinium</i> symbiosis: Host–symbiont spatial coordination and species–specific regulation
9:30AM	13–4	Tisa, L. ¹ , Svistoonoff, S. ² , Pesce, C. ¹ , Cissoko, M. ³ , Hurst, S. ¹ , Swanson, E. ¹ , Oshone, R. ¹ , Hocher, V. ² , Gherbi, H. ² , Sy, M.O. ³ ; University of New Hampshire ¹ , Institute of Research for Development ² , Cheikh Anta Diop University ³	<i>Frankia</i> genomics and genome–guided approaches toward understanding the actinorhizal symbiosis and signaling
9:45AM	13–5	Miller, K.I. ¹ , Franklin, C.D. ¹ , Mattila, H.R. ² , Newton, I.L.G. ¹ ; Indiana University ¹ , Wellesley College ²	Social microbes use quorum sensing to colonize the eusocial honey bee (<i>Apis mellifera</i>)
10:00AM–10:30AM		Coffee Break	The LaSells Stewart Center
10:30AM–12:15PM		Session 14	CH2M HILL Alumni Center Ballroom
Mechanisms of host–microbiome interactions			
<i>Chair: Thomas Sharpton</i>			
10:30AM	14–1	Bordenstein, S. ; Vanderbilt University	The genetic legacy of a bacteriophage in animal reproduction
11:00AM	14–2	Samuel, B. ¹ , Zhang, F. ¹ , Weckhorst, J.L. ¹ , Ayoub, C.A. ¹ , Félix, M.A. ² ; Baylor College of Medicine ¹ , Institut de biologie de l’ENS ²	Cultivated relationships: Host genetic landscapes that shape microbiome acquisition and homeostasis
11:15AM	14–3	Armour, C. , Sharpton, T.J.; Oregon State University	A metagenomic meta–analysis reveals functional signatures of health and disease in the human gut microbiome
11:30AM	14–4	Quides, K. , Salaheldine, F., Jariwala, R., Sachs, J.; University of California, Riverside	Conflict of fitness over nodulation in the legume–rhizobium symbiosis
11:45AM	14–5	Hutchinson, C. ¹ , Brodhagen, M. ¹ , Miner, B. ¹ , Schaeffer, A. ¹ ; Western Washington University ¹ , University of Washington ²	Characterization of potential bacterial pathogens and quorum sensing activity in <i>P. ochraceus</i> stars suffering from sea star wasting disease
12:00PM	14–6	Koch, E. , Ruby, E.G., McFall–Ngai, M.J.; University of Hawai‘i at Mānoa	Examining the role of macrophage migration inhibitory factor in mutualistic associations using the squid–vibrio symbiosis
12:15PM–1:30PM		Lunch Break	Patio

Thursday Program (continued)

1:30PM–3:00PM Session 15 CH2M HILL Alumni Center Ballroom

Evolution of vertebrate– and invertebrate–protist interactions

Chair: John Burns

1:30PM	15–1	Kerney, R. ¹ , Burns., J. ² ; Gettysburg College ¹ , American Museum of Natural History ²	Host specificity and tolerance of intracellular algae in the spotted salamander, <i>Ambystoma maculatum</i>
1:45PM	15–2	Burns, J. ¹ , Duhamel, S. ² , Adikes, R. ³ , Matus, D. ³ , Kerney, R. ⁴ ; American Museum of Natural History ¹ , Columbia University ² , Stony Brook University ³ , Gettysburg College ⁴	Thinking about metabolite transfer from symbiont to host in a vertebrate algal endosymbiosis
2:00PM	15–3	Bishop, C. , Graham, L., Jurga, E.; St. Francis–Xavier University	Egg masses of the northeastern yellow spotted salamander are rarefied ecological spaces for microbial taxa: An expanding view of a symbiosis
2:15PM	15–4	Dow, E.G. , Rodriguez–Lanetty, M.; Florida International University	The evolution of function in ionotropic glutamate receptors respective to host signaling
2:30PM	15–5	Zarate, D. , Mendoza, T., Li, J.; University of Colorado Boulder	Does Vacuolar H ⁺ /ATPase (VHA), an acid–base regulating protein, facilitate photosymbiosis in Bivalves?
2:45PM	15–6	Swain, T. , Backman, V., Marcelino, L.A.; Northwestern University	Phylogenetic analysis of <i>Symbiodinium</i> transmission modes reveal evolutionary patterns in thermotolerance and host specificity that may contribute to coral bleaching resistance

3:00PM–3:30PM Coffee Break The LaSells Stewart Center

1:30PM–2:45PM Session 16 The LaSells Stewart Center, Construction and Engineering Hall

Fungal–host interactions: The varied form of fungal–plant associations

Chair: Gavin Kernaghan

1:30PM	16–1	Busby, P. ¹ , Barge, E. ¹ , Rojas, A. ² , Vilgalys, R. ² ; Oregon State University ¹ , Duke University ²	Phylogenetic structure and ecological function of foliar endophytic <i>Cladosporium</i> associated with <i>Populus trichocarpa</i>
1:45PM	16–2	Leopold, D.R. ¹ , Jacobson, D. ² , Busby, P. ¹ ; Oregon State University ¹ , Oak Ridge National Laboratory ²	Distinguishing environmental from host genetic impacts on the <i>Populus</i> leaf microbiome
2:00PM	16–3	Thomsen, C. ¹ , Bowen, P. ² , Hart, M. ¹ ; University of British Columbia Okanagan, Agriculture and Agri–Food Canada	Improving agricultural sustainability: Are biofertilizers more effective in a perennial system?
2:15PM	16–4	McCormick, M. ¹ , Bahler, E. ² , Thrift, E. ³ , O’Neill, J.P. ¹ , Whigham, D.F. ¹ ; Smithsonian Environmental Research Center ¹ , Illinois College ² , University of Maryland ³	Effects of bacteria within fungal hyphae on the function of orchid mycorrhizal fungi
2:30PM	16–5	Vukicevich, E. ¹ , Lowery, T. ² , Urbez–Torres, J.R. ² , Bowen, P. ¹ , Hart, M. ¹ ; University of British Columbia ¹ , Agriculture and Agri–Food Canada ²	Investigating the link between function and identity of arbuscular mycorrhizal fungi within healthy and necrotic roots

2:45PM–3:30PM Coffee Break The LaSells Stewart Center

E-1	McCammon, A. and Sikkel P.C.; Arkansas State University	Introducing symbiosis via an ecological model in an informal learning exhibit
E-2	Stock, S.P.; University of Arizona	Nematode–bacteria symbiosis
E-3	Selosse, M.A.; French National Museum of Natural History, University of Gdańsk	The overlooked tree–mites symbiosis
E-4	Nadal–Jimenez, P.; University of Liverpool	<i>Nasonia vitripennis</i> and superparasitism
E-5	Ohbayashi, T.; French National Center for Scientific Research, Hokkaido University	The bean bug <i>Riptortus pedestris</i> and its midgut
E-6	Díaz–Almeyda, E.; Emory University	From farm to symbiont using the squash bug system
E-7	Maire, J.; University of Lyon	The cereal weevil and its nutritional endosymbiont
E-8	Hembry, D.; University of Arizona	Leafflower–moth interactions, a kind of brood pollination
E-9	Gupta, M.M. ¹ , Sharma, M.P. ² ; University of Delhi ¹ , Indian Institute of Soybean Research ²	Arbuscular mycorrhizal symbiosis
E-10	Vukicevich, E.; University of British Columbia	The dynamics of the AM fungal symbiosis in aging roots
E-11	McCormick, M.; Smithsonian Environmental Research Center	Orchid mycorrhizal fungi and endobacteria, a symbiosis within a symbiosis
E-12	Doty, S.L.; University of Washington	Plant microbiome (bacterial endophytes)
E-13	Wendlandt, C.; University of California, Riverside	Phenotypic variation in legumes
E-14	Scharnagl, K.; Michigan State University	Lichens
E-15	Ruprecht, U.; University of Salzburg	Lichens – tough organism in extreme habitats
E-16	Koch, J.C.; Oregon State University	Photosynthetic symbioses between algae and anemones or corals
E-17	Not, F.; Station Biologique de Roscoff	PlanktoMania: Dive into the microscopic world of the oceans through augmented and virtual reality
E-18	Piquet, B.; Sorbonne Université	<i>Bathymodiolus azoricus</i> and their endosymbionts
E-19	Leisch, N.; Mack Planck Institute for Marine Microbiology	Exploring the oases of the deep–sea

Friday Program

8:30AM–10:15AM Session 17 CH2M HILL Alumni Center Ballroom

Rise and fall of symbiosis: Evolutionary transitions

Chair: Seth Bordenstein

8:30AM	17-1	Sachs, J. ; University of California, Riverside	Cheating and punishment in plant–bacterial symbioses
9:00AM	17-2	Nelsen, M.P. , Ree, R.H., Moreau, C.S.; Field Museum of Natural History	The evolution of ant–plant interactions is characterized by asymmetric diversification
9:15AM	17-3	Smith, E.A. , Newton, I.L.G.; Indiana University	Comparative genomics reveals horizontal gene transfer signatures with the transition to honeybee association in acetic acid bacteria
9:30AM	17-4	Dixon, G. ¹ , Kenkel, C. ² ; University of Texas, at Austin ¹ , University of Southern California ²	Using comparative transcriptomics to identify genes involved in the evolution of coral symbiont transmission mode
9:45AM	17-5	Łukasik, P. , Bublitz, D., McCutcheon, J.; University of Montana	Degenerative processes in ancient nutritional endosymbionts of cicadas
10:00AM	17-6	Hembry, D. ¹ , Luo, S. ² , Fowler, J. ³ , Duarte, J. ⁴ , Whiteman, N. ⁵ , Dlugosch, K. ¹ ; University of Arizona ¹ , South China Botanical Garden ² , University of Washington ³ , Pima Community College ⁴ , University of California, Berkeley ⁵	Repeated breakdown of mutualism into parasitism and ecological opportunity in a high–intimacy plant–insect mutualism

10:15AM–10:45PM Coffee Break The LaSells Stewart Center

10:45AM–12:15PM Session 18 CH2M HILL Alumni Center Ballroom

New tools and approaches for studying symbiosis

Chair: Sharon Doty

10:45AM	18-1	Stacey, G. ; University of Missouri	Can we transfer biological nitrogen fixation to non–leguminous plants?
11:15AM	18-2	McIlroy, S.E. , Wong, J.C.Y., Baker, D.M.; The University of Hong Kong	Cryptic competition among coral symbionts
11:30AM	18-3	Selosse, M.A. ^{1,2} , Lallemand, F. ¹ , Minasiewicz, J. ² , Jakalski, M. ² , Delannoy, E. ¹ ; French National Museum of Natural History ¹ , University of Gdańsk ²	Mixotrophic plants: How to eat your mycorrhizal fungi. A study on green terrestrial orchids
11:45AM	18-4	Hegde, S. ¹ , Nilyanimit, P. ² , Hughes, G.L. ¹ ; University of Texas Medical Branch ¹ , Chulalongkorn University ²	CRISPR/Cas9–mediated genome engineering of symbiotic <i>Enterobacter</i> reveals the role of ompA in colonization of mosquitoes
12:00PM	18-5	Gaulke, C. , Sharpton, T.; Oregon State University	Identification of conserved metagenomic diversity and response to perturbation in vertebrates

12:15PM–1:30PM Lunch Break Patio

Ecology and physiology of *Symbiodinium*–cnidarian mutualisms

Chairs: Katie Barott, Alan Verde

1:30PM	19–1	Dimond, J. ^{1,2} , Roberts, S. ¹ ; University of Washington ¹ , Western Washington University ²	Comparative response of DNA methylation to environmental change in the reef coral <i>Porites astreoides</i> and its symbiotic dinoflagellates
1:45PM	19–2	Tortorelli, G. ¹ , McFadden, G.I. ¹ , Davy, S.K. ² , van Oppen, M.J.H. ³ ; University of Melbourne ¹ , University of Wellington ² , Australian Institute of Marine Science ³	Host genotypic effect on the establishment of symbiosis with different <i>Symbiodinium</i> types in the coral model organism <i>Exaiptasia pallida</i>
2:00PM	19–3	Levy, O. ; Bar-Ilan University	Setting the pace: Host rhythmic behaviour and gene expression patterns are determined largely by <i>Symbiodinium</i> in the facultatively symbiotic cnidarian <i>Aiptasia</i>
2:15PM	19–4	Koch, J. ¹ , Verde, E.A. ² , Weis, V.M. ¹ ; Oregon State University ¹ , Maine Maritime Academy ²	Low carbonic anhydrase activity in <i>Elliptochloris</i> –containing <i>Anthopleura elegantissima</i> and the negative correlation between diameter and carbonic anhydrase activity
2:30PM	19–5	Wong, J.C.Y. , Baker, D.D.M.; The University of Hong Kong	Functional diversity of resource acquisition traits between <i>Symbiodinium</i>
2:45PM	19–6	Hancock, H. ; Old Dominion University	Metabolism of <i>Acropora cervicornis</i> with acute and cumulative thermal stress suggests limited acclimation potential of the symbiome
3:00PM	19–7	Barott, K. ¹ , Davidson, J. ² , Huffmyer, A. ² , Lenz, E. ² , Hancock, J. ² , Glazer, B. ² , Gates, R.D. ² ; University of Pennsylvania ¹ , University of Hawai'i ²	Developing strategies to promote the resilience of coral symbiosis in the face of climate change

Bacterial interactions in marine organisms

Chairs: Tara Essock–Burns, David Needham

1:30PM	20–1	Essock–Burns, T. , Moriano–Gutierrez, S., McFall–Ngai, M.; University of Hawai'i at Mānoa	Spatiotemporal expression of host genes in response to colonization in the <i>Euprymna scolopes</i> – <i>Vibrio fischeri</i> symbiosis
1:45PM	20–2	Moriano–Gutierrez, S. ¹ , Bongrand, C. ¹ , Cohen, S. ^{1,2} , Meibom, A. ^{2,3} , Ruby, E. ¹ , McFall–Ngai, M. ¹ ; University of Hawai'i at Mānoa ¹ , Ecole Polytechnique Fédérale de Lausanne ² , University of Lausanne ³	The bacterial small RNA SsrA is essential for normal colonization in the squid–vibrio symbiosis
2:00PM	20–3	Leisch, N. , Franke, M., Geier, B., Dubilier, N.; Mack Planck Institute for Marine Microbiology	Symbiont colonization and host development of early life stages of bathymodiolin mussels
2:15PM	20–4	Piquet, B. ¹ , Shillito, B. ¹ , Szafranski, K.M. ¹ , Lallier, F.H. ¹ , Duperron, S. ² , Anderson, A. ¹ ; Sorbonne Université ¹ , Muséum National d'Histoire Naturelle ²	Cellular turnover in the symbiont–housing gills of deep–sea mussels: Which mechanisms to regulate their microbiote?

Friday Program (*continued*)

2:30PM	20-5	Dungan, A. ¹ , Blackall, L.L. ¹ , van Oppen, M.J.H. ^{1,2} ; The University of Melbourne, Australia ¹ , Australian Institute of Marine Science ²	<i>Exaiptasia pallida</i> as a model to explore probiotics for climate resilience in corals
2:45PM	20-6	Yung, C. ¹ , Wilke, S. ¹ , Poirier, C.L. ¹ , Malmstrom, R.R. ² , Santoro, A.E. ³ , Kuo, A. ² , Grigoriev, I.V. ² , Worden, A.Z. ¹ ; Monterey Bay Aquarium Research Institute ¹ , U.S. Department of Energy Joint Genome Institute ² , University of California, Santa Barbara ³	<i>In situ</i> interactions between a diatom and bacterium in the coastal ocean
3:00PM	20-7	Needham, D.M. ¹ , Poirier, C. ¹ , Wilken, S. ¹ , Yung, C.M. ¹ , Malmstrom, R.R. ² , Choi, C.J. ¹ , Worden, A.Z. ¹ ; Monterey Bay Aquarium Research Institute ¹ , U.S. Department of Energy Joint Genome Institute ²	Metabolically restricted bacteria associated with a marine choanoflagellate: Friend or foe?

3:20PM-3:40PM

**Closing Remarks from ISS
President, Simon Davy**

CH2M HILL Alumni Center Ballroom