--COVER PAGE--

INVESTIGATIONS INTO THE METABOLIC DIVERSITY OF MICROORGANISMS AS PART OF MICROBIAL DIVERSITY

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Grant Number: DE-FG02-85ER13361
DOE/Office of Science Program Office: BES
Topic Area Program Manager: Dr. Robert Stack

Award POP Dates: 5/1/1985 thru 4/30/2016

Date Report Prepared: 7/25/2016

OVERVIEW OF THE COMPLETED FUNDING PERIOD

DOE funds supported a key portion of the MBL Microbial Diversity (Woods Hole) program across 6 complete summers. The initial 4 years of the funded period were overseen by two co-Directors, Daniel Buckley (Cornell) and Steve Zinder (Cornell), who then completed their term. The final 2 summers were overseen by 2 new co-Directors, Jared R. Leadbetter (Caltech) and Dianne Newman (Caltech). The 6 funded summer iterations of the course included the incorporation of new themes such as single cell approaches applied to natural microbial communities (cell separation and sorting, genome amplification from single cells, and the use of Nano-SIMS to examine assimilation of carbon and nitrogen from isotopically labeled substrates into single cells), genetics and genomics on bacteria freshly isolated during the course of the programs, quantitative systems biology, and modern quantitative light microscopy.

During the funded period, the Microbial Diversity course provided 120 graduate students, postdoctoral scholars, and early- and established investigators (20 each summer, for each of the 6 summers) with an unequaled opportunity to explore the microbial diversity of the natural world, as it relates to the DOE mission. Each summer, the course was an immersive research experience consisting of 6.5 weeks of lectures, laboratory exercises, field work, and individual and group research projects. Leading research scientists from around the world visited the course every summer to participate in course mini-symposia, to lecture, and to interact with students in the laboratory and in the field. The immersive, integrative, inter-disciplinary, and international nature of the course provides a training opportunity that was not and is not not provided elsewhere in the United States. The overall goal of the program during the funding period was to recruit the next generation of elite researchers working in the microbial biosciences, in particular those who will focus in environmental, systems, earth systems sciences, and bioenergy sciences. Indeed, a large fraction of past participants in the program since 1971 have progressed on to become national and international research leaders in the field. Because of the program's long-term impact on research microbiology: in 2013, the MBL Microbial Diversity Summer Program was named a *Milestones in Microbiology* site by the *American Society for Microbiology.* The formal plaque describing this is now installed just outside Microbial Diversity laboratory space in the Loeb Building on the MBL campus

Throughout the history of the program, including the 6 funded iterations, students and early career TA staff presented summer research findings and discoveries at both national and international scientific conferences, and published refined studies in archival, peer-reviewed literature (*see examples from the 6 funded summers, below*).

WHO WERE THE STUDENT PARTICIPANTS OF THE SUMMER PROGRAM & WHAT KINDS OF RESEARCH DID THEY PERFORM?

As a representative sample: the Microbial Diversity student core last summer of 2015 was composed of 11 women (including 1 Latina) and 9 men. Of the 20 students: 15 were PhD students and 5 were post-doctoral associates. Nine were international, 4 of whom were based at institutions abroad. A total of 17 academic research institutions were represented by these students, including 10 US states and Puerto Rico. Additionally, three current and past HHMI EXROP students (*all three Latino/a*) served on the Teaching/Research Staff of the program, and performed and/or oversaw their own research projects.

A full alphabetical list of the 120 students of the program over the 6 years of funding is provided below:

Abdul Halim, Mohd Farid	*University of Pennsylvania*
Abramovich, Reut Sorek	*University of New South Wales*
Abreu, Fernanda	*Universidade Federal do Rio de Janeiro*
Armitage, David	*University of California Berkeley*
Aruda, Amalia	*Woods Hole Oceanographic Institution*
Behrendt, Thomas	*Max Planck Institute for Chemistry*
Berben, Berben	*University of Amsterdam*
Blanton, Jessica	*University of California, San Diego*
Blasiak, Leah	*University of Maryland*
Boidi, Flavia	*Planta Piloto de Procesos Industriales Microbiologicos*
Brigham, Brian	*Queens College, City University of New York*
Buchwald, Carolyn	*Woods Hole Oceanographic Institution*
Buck, Moritz	*Uppsala University*
Buckner, Caroline	*University of North Carolina*
Campbell, Kate	*U.S. Geological Survey*
Cappelletti, Martina	*University of Bologna*
Cardarelli, Emily	*Stanford University*
Cheng, Bingran	*University of Southern California*
Choi, Jessica	*Rutgers University*
Cohen, Jacob	*Harvard University*
Conner, Jenna	*University of California Santa Cruz*
Cordero, Otto	*Massachusetts Institute of Technology*
Cregger, Melissa	*University of Tennessee*
Dabrowska, Alicja	*University of Warwick*
Donaldson, Teraya	*University of Richmond*
El Khawand, Myriam	*University of East Anglia*
Enke, Tim	*ETH Zurich*
Ettinger, Cassandra	*University of California, Davis*
Gallagher, Kimberly	*University of Connecticut*
Garcia, Diego Giao	*Aarhus University*
Gazitua, Maria Consuelo	*Universidad Mayor*
Gerardin, Ylaine	*Harvard University*
Glass, Jennifer	*Arizona State University*
Graham, Emily	*University of Colorado at Boulder*

Gravuer, Kelly	*University of California, Davis*
Greenspan, Alex	*University of California, Davis*
Hall, Edward	*University of Vienna*
Hannah Naughton	*University of Michigan*
Hargreaves, Katherine	*University of Arizona*
Hausladen, Debra	*Stanford University*
Hemp, James	*University of Illinois at Urbana-Champaign*
Henriksen, James	*Idaho National Laboratory*
Hestrin, Rachel	*Cornell University*
Heyward, Christa	*Children's Hospital of Philadelphia*
Holmes, Jeffrey	*Warren Wilson College*
Huang, Yue (Yolanda)	*Harvard University*
Humphrey, Parris	*University of Arizona*
Hurley, Sarah	*Harvard University*
Huse, Holly	*University of Texas at Austin*
Irizzary, Ivelisse	*Universidad del Turabo, Puerto Rico*
Jacome, Luz Puentes	*University of Toronto*
Jaekel, Ulrike	*Max Planck, Marine Microbiology*
Jangir, Yamini	*University of Southern California*
Jesus, Ederson	*Embrapa Agrobiology*
Kav, Aya Brown	*Tel Aviv University*
Kearney, Sean	*Massachusetts Institute of Technology*
Kelly, Libusha	*Massachusetts Institute of Technology*
Kiang, Nancy	*NASA Goddard Institute for Space Studies (GISS)*
Kotlarz, Nadine	*University of Michigan*
Kraft, Beate	*Max Planck Institute for Marine Microbiology*
Krause, David	*University of Illinois*
Krusor, Megan	*University of California Davis*
Lagostina, Lorenzo	*ETH Zurich*
Larsen, Steffen	*Aarhus University*
Ling, Alison	*University of Colorado, Boulder*
Liu, Xiaolei	*Massachusetts Institute of Technology*
Ma, Peijun	*Vanderbilt University*
Mariita, Richard	*Auburn University*
Mathai, Prince	*Marquette University*
Melton, Emily	*Eberhard-Karls-Universitat Tubingen*
Meng, Li	*University of Hong Kong*
Meredith, Laura	*Massachusetts Institute of Technology*
Mondo, Stephen	*Cornell University*
Mukherjee, Dishari	*Michigan State University*
Murali, Ranjani	*University of Illinois, Urbana-Champaign*
Neubauer, Cajetan	*California Institute of Technology*
Omairi-Nasser, Amin	*The University of Chicago*
Pavissich, Juan	*University of Notre Dame*
Peng, Xuefeng	*Princeton University*
Pishchany, Gleb	*Harvard Medical School*
Rampersaud, Ryan	*Columbia University*
Rangel, Lorena	*University of California Davis*
Reese, Aspen	*Duke University*
Rivera, Jessica	*University of Puerto Rico, Rio Piedras*
Roller, Benjamin	*University of Michigan*

Ruff, Sebastian	*Max-Planck-Institute for Marine Microbiology, Bremen*
Russell, James	*Stanford University*
Salman, Verena	*Max-Planck-Institute for Marine Microbiology, Bremen*
Sarno, Analissa	*Arizona State University*
Schick, Michael	*Max Planck Institute for Terrestrial Microbiology, Marburg*
Scholz, Rebecca	*University of Washington*
Schubotz, Florence	*Massachusetts Institute of Technology*
Scott Saleska,	*University of Arizona*
Shade, Ashley	*Yale University*
Sharon, Gil	*Tel Aviv University*
Singer, Esther	*University of Southern California*
Smith, Heidi	*Montana State University*
Stacy, Apollo	*The University of Texas at Austin*
Starnawski, Piotr	*Aarhus University*
Suter, Elizabeth	*Stony Brook University*
Szoboszlay, Márton	*University of Kentucky*
Tapilatu, Yosmina	*Indonesian Institute of Sciences*
Thiele, Stefan	*Max Planck Institute for Marine Microbiology*
Tien, Matthew	*University of Chicago*
Tikhonov, Mikhail	*Harvard University*
Torti, Andrea	*Aarhus University*
van Steendam, Caroline	*University of Michigan*
Vuono, David	*Colorado School of Mines*
Wang, Harris	*Harvard University*
Weisenhorn, Pamela	*University of Minnesota*
Whitman, Thea	*Cornell University*
Wilbanks, Elizabeth	*University of California, Davis*
Williams, David	*University of Connecticut*
Wolfson, Sarah	*Rutgers University*
Wu, Yunji	*California Institute of Technology*
Xu, Yan	*Princeton University*
Yang,Tingting	*University of North Carolina*
Youngblut, Nicholas	*University of Illinois at Urbana-Champaign*
Zhang, Ying	*Woods Hole Oceanographic Institution*

SPECIAL RESEARCH PROJECTS

The final ½ of the program every summer involved students following their newfound interests and expertise to design original and discovery driven research --quite notably, projects independent from their research projects at their home institutions. The goal was to reinforce the approaches, techniques, skills, and concepts that the students have been immersed during the initial weeks. It wasn't rare for students to make original discoveries as well. In the final days of the program, students presented their findings to all course participants, and wrote reports maintained in the course archives.

Abdul Halim, Mohd Farid	*The microbial community diversity involved in iron cycling.*
Abramovich, Reut	*Anaerobic nitrogen fixation in microbial mats from Little Sippewissett Marsh, Woods Hole, MA*
Abreu, Fernanda	*Metal corrosion and biological H2S cycling in closed systems*
Armitage, David	*Ecological investigations into the causes and consequences of cyanobacterial diversity*
Aruda, Amalia	*Bacteria Along For The Ride: Exploring Microbial Interactions From Copepods To Anabaena*
Behrendt, Thomas	*Identification of footprints of microbial activity and their applicability for trace gas emission studies from soil after a rewetting event*
Berben, Tom	*Intracellular calcium carbonate crystals as a possible protection against acidification in Achromatium spp.*
Blanton, Jessica	*Attachment of host-associated methanogens: Courting the wallflowers*
Blasiak, Leah	*Sea Squirt Symbionts!*
Boidi, Flavia	*Enrichments of non-phototrophic sulfur oxidizing and sulfate reducing bacteria from Salt Pond sediments*
Brigham, Brain	*Methanogen oxygen stress: an investigation of the superoxide dismutase gene*
Bruckner, Caroline	*Imaging anaerobic methane oxidation at environs near Woods Hole*
Buchwald, Carolyn	*Testing Our Ability To Accurately Measure Nitrification Rates In The Oligotrophic Ocean: Does Adding Ammonium Affect The Nitrifier Community Composition?*
Buck, Moritz	*Hunting for rare and undersampled phyla in Trunk-river "lemonade" microbial communities.*
Campbell, Kate	*Acidophilic Fe(ii) oxidation: Kinetics of Fe(ii) oxidation by an acidic rock drainage enrichment culture*
Cappelletti, Martina	*Characterization Of Anoxygenic Phototrophs That Grow Using Infrared Radiation*
Cardarelli, Emily	*Unraveling the black box of aquaria biofilter function: fishing for novel ammonia-oxidizing archaea associations*
Cheng, Bingran	*A study of Hyphomicrobium - measurement of denitrification and examination of manganese oxidation*
Choi, Jessica	*Tamin' the amoebae: a preliminary investigation of genetic manipulation of marine microbial predatory eukaryotes.*
Cohen, Jacob	*Growth of acetogens at different pH levels with varying carbon and energy sources*
Conner, Jenna	*Environmental conditions impact the chirality of branching*

	Bacillus strains
Cordero, Otto	*Enriching Spatially Structured Communities Of Cellulose Degraders*
Cregger, Melissa	*Long-Term Oil Contamination Yields Novel Phylum Of Bacteria By 454 Pyrosequencing*
Dabrowska, Alicja	*Diversity of soil microorganisms: interactions between novel isolates.*
Donaldson, Teraya	*Treating seawater biofilms with violacein extracts*
El Khawand, Myriam	*The effect of age on leaf microbial community*
Enke, Tim	*Enrichment of electrochemically active bacteria using a microbial fuel cell and potentiostat.*
Ettinger, Cassandra	*Hunting for microbial eukaryotes: tales from Trunk River*
Gallagher, Kimberly	*Methanogens In The Oxic Zone*
Gazitua, Maria Consuelo	*Coexistance of acetogens, methanogens and sulfate reducing bacteria in enrichments from Trunk River*
Gerardin, Ylaine	*Viral impact on microbial community composition in a marine ecosystem*
Giao Garcia, Diego	*Novel approach for the isolation and identification of sulfur bacteria by chemotaxis assays*
Glass, Jennifer	*Characterization Of Methanogenic Communities And Nickel Requirements For Methane Production From Wood Hole Marshes And Isolation Of A Novel Methanogen Of The Order Methanomicrobiales From Eel Pond Mud*
Graham, Emily	*How do bacterial interactions influence ecosystem development in cheese?*
Gravuer, Kelly	*A brief investigation of the influence of spatial habitat structure and phylogenetic relatedness on soil microbial community assembly*
Greenspan, Alex	*Cyanobacteria: cyanobacteria: are they the only?*
Hall, Edward	*The effect of carbon subsidies on planktonic niche partitioning and recruitment of bacteria to marine biofilms*
Hargreaves, Katherine	*The domestication of wild sulfate reducers: establishing a continuous culture for maintaining biofilm phenotype.*
Hausladen, Debra	*Stinky potatoes and their impact on biotic metal reduction*
Hemp, James	*The Search For Ancestrally Anoxygenic Or Non-Phototrophic Cyanobacteria*
Henriksen, James	*Light utilization by cultured and environmental cyanobacteria as measured by high throughput and single cell measurements and methods*
Hestrin, Rachel	*FISHing for bacteria-eukaryote associations*
Heyward, Christa	*Attracting resident magnetotactic bacteria in the Little Sippewissett Salt Marsh*
Holmes, Jeffrey	*A Preliminary Foray Into Domesticating Pirellula, The Little Pears, As A Model Planctomycetes*
Huang, Yue (Yolanda)	*Characterization of encystation and excystation in a microbial eukaryote, Nuclearia simplex.*
Hurley, Sarah	*Shifts In The Relative Abundance Of Ammonia-Oxidizing Bacteria And Archaea In The Water Column Of A Stratified Marine Environment, Salt Pond*
Irizarry, Ivelisse	*Diversity of endophytes in various plants from Woods Hole, MA*

Jacome, Luz Puentes	*Microscopy and FISH mini-study of four contaminant -degrading enrichment cultures*
Jaekel, Ulrike	*Microbial degradation of chlorophyll*
Jangir, Yamini	*Biofilms on abiotic surfaces - in situ and in laboratory experiments*
Jesus, Ederson	*Activity of methyl phosphonate consuming organisms and enrichments from berry ponds in Little Sippewissett Salt Marsh*
Kav, Aya Brown	*Phenotypic pan- and core-genome characterization of bioluminescent vibrios*
Kearney, Sean	*Colorful niches enable in situ enrichment of surface-attached phototroph communities.*
Kelly, Libusha	*Microbial community stability in anoxic sediments under conditions of shifting salinity, oxygen, and sulfate*
Kiang, Nancy	*Looking for a green sulfur bacterium that oxidizes ferrous iron*
Kotlarz, Nadine	*Diversity of phage of bioluminescent bacteria in woods hole, MA*
Kraft, Beate	*NC10 phylum*
Krause, David	*Genetic and biochemical analyses of pigmented ring formation in colonies of Pseudoalteromonas sp. 15DK1*
Krusor, Megan	*The effect of redox potential on bioluminescence in Vibrio species*
Lagostina, Lorenzo	*Morphological and behavioral characterization of the microbial eukaryote, Corallomyxa tenera.*
Larsen, Steffen	*Investigations of pink berry cross-feeding*
Li, Meng	*Using genefish to detect archaeal AmoA genes in microbial mats and biofilms*
Ling, Alison	*Sequencing and characterization of Pseudoaltermonas spp. phage from eel pond*
Liu, Xiaolei	*Diversity of biofilm-forming, purple sulfur phototrophic bacteria enriched from Trunk River.*
Ma, Peijun	*Searching For A Circadian Clock In Rhodopseudomonas Palustris Strain TIE-1 By Oxygen Entrainment*
Mariita, Richard	*Isolation and characterization of species affiliated with the family Actinomycetaceae*
Mathai, Prince	*An insight into the diversity of aerobic methanotrophs in different habitats*
Melton, Emily	*Sulfide oxidizing bacteria in gradient tubes*
Meredith, Laura	*Substrate exchange within the Anabaena-epibiont association does H_2 drive symbiosis?*
Mondo, Stephen	*Determining the etiology of epizootic shell disease of the North American lobster Homarus americanus*
Mukherjee, Dishari	*The colorful lives of actinomycetes: Exploring soil and marine actinomycetes, their secondary metabolites and the influence interspecies interactions*
Murali, Ranjani	*Effects of vortical flow and shear stress on bacterial behavior and aggregation*
Naughton, Hannah	*Facultative Fe(III) and Mn(IV) reducer diversity*
Neubauer, Cajetan	*Enrichments for phototrophic iron and manganese oxidizers from Little Sippewissett and School Street Marsh*

Omairi-Nasser, Amin	*Looking for phototrophs that use methane and methanol as electron donor*
Pavissich, Juan	*Assessment of hollow-fiber membrane chambers as environmental cultivation systems for sulfate-reducing microorganisms*
Peng, Xuefeng Nick	*Investigating microbial communities in salt marsh sediments using card-fish*
Pishchany, Gleb	*Fake plastic planets of the Sippewissett Universe*
Rampersaud, Ryan	*Modeling The Effects Of Acid Rain On Soil Microbial Communities: How pH Alters The Structure, Composition, And Metabolic Capabilities*
Rangel, Lorena	*I went to the beach and brought back sand: a story of anoxygenic phototrophic bacteria*
Reese, Aspen	*20,000 Leagues into the Cheese: an exploration of spatial organization in cheese rinds.*
Rivera, Jessica	*Chemotaxis assays for marine and freshwater amoebae.*
Roller, Benjamin	*Genetic and genomic analysis of a recently isolated gliding bacterium*
Ruff, Emil	*Physiological And Morphological Characterization Of Two Bacillus Strains*
Russell, James	*Bioluminescence in Vibrio speices: a mechanism for redox homeostasis?*
Saleska, Scott	*Imaging a novel methanogen from thawing permafrost*
Salman, Verena	*Study Of Phylogenetic Consistency, Structure And Origin Of The Pink Berries In Great And Little Sippewissett Salt Marsh*
Sarno, Analissa	*Transposon mutagenesis of a violacein producing Janthinobacterium species*
Schick, Michael	*Sulfur-Cycle, Nitrogenase, And Carbon Utilization In Red Berries*
Scholz, Rebecca	*Spying on spirilla: tracking diffusion in the presence of spiral bacteria.*
Schubotz, Florence	*Degradation of toluene by microbial mats investigated through culture-dependent and culture independent techniques*
Shade, Ashley	*The Kombucha Biofilm: A Model System For Microbial Ecology*
Sharon, Gil	*Secondary metabolite production by streptomycetes in situ and in vivo*
Sharon, Gil	*Phage fish - a method for fishing bacteriophage host*
Singer, Esther	*The many talents of many-celled magnetotactic bacteria*
Smith, Heidi	*Diel fluctuations in nitrogen fixation in microbial mats from Great Sippewissett marsh*
Stacy, Apollo	*Microbial phosphorus acquisition - a tale of drugs, flowers, and metal*
Starnawski, Piotr	*Chemosynthetic symbioses model based on Solemya velum endosymbiont*
Suter, Elizabeth	*Investigation into methane production: an oxic story?*
Szoboszlay, Márton	*Protists versus purple bacteria*
Tapilatu, Yosmina	*Morphological characterization of putative phages infecting soil Streptomyces from Woods Hole, Massachusetts*
Thiele, Steffan	*Metagenomics of a microbial mat*

Tien, Matthew	*Investigations into holdfast development in α-Proteobacteria*
Tikhonov, Mikhail	*Community-level metabolic characterization of a consortium.*
Torti, Andrea	*Culture-independent assessment of dissolved DNA as a nutrient source in the marine environment*
van Steendam, Caroline	*Looking for syntrophic acetogen/methanogen interactions.*
Vuono, David	*Dynamics And Diversity Of Activated Sludge And Sewage-Derived Microbial Populations In A Fullscale Sequencing Batch Reactor*
Wang, Harris	*DNA subsistence, natural competency, and horizontal gene transfer in marine and soil organisms in the environment*
Weisenhorn, Pamela	*All the single electrons: Do anaerobes put them on a ring?*
Whitman, Thea	*Applying 13C stable isotope probing and the pufM gene to investigate anoxygenic phototrophs in the pink layer of a salt marsh microbial mat*
Wilbanks, Lizzy; Humphrey Paris; & Jaekel, Ulrike	*Eco-physiology of macroscopic pink and green bacterial consortia of the Little Sippewissett salt marsh*
Williams, David	*Niche separation in methanol consuming bacteria isolated from trees and plants*
Wolfson, Sarah	*Investigating the impacts of toluene on diversity*
Wu, Yunji	*An odd enrichment for purple non-sulfur bacteria from Trunk River*
Xu, Yan	*Stable isotope probing of DNA in methanotrophs in soil*
Yang, Tingting	*Function of intercellular calcite granules in Achromatium from Little Sippewissett Salt Marsh*
Youngblut, Nicholas	*Ammonia Oxidation In The Great Sippewissett Salt Marsh: Who, Where, And When?*
Zhang, Ying	*Journey to the new world: a tale of microbes*

EXAMPLES OF "VISIBLE EXTERNAL" MBL MICROBIAL DIVERSITY RESEARCH PROJECT PRODUCTIVITY DURING THE FUNDING PERIOD

In was not atypical for students and staff to present their special research project findings at meetings, and/or to publish studies in peer-reviewed, archival journals in the year or years after their participation in the program. Many other examples of projects leading to publications have been published in preceding years, and are not listed here.

Publications resulting from special research projects performed by Microbial Diversity students and staff during the DOE funding period:

1. **Blasiak, L.C**., Zinder, S.Z., Buckley, D.H., Hill R.T. (2013) Specific and conserved tunic bacterial community in the model chordate *Ciona intestinalis*. *ISMEJ*. *doi:10.1038/ismej.2013.156*

2. **Armitage, D. W.**, **Gallager, K. L.**, **Youngblut, N. D.,** Buckley D. H., Zinder S. H. (2012) Millimeter-scale patterns of phylogenetic and trait diversity in a salt marsh microbial mat. *Frontiers in Microbiology.* 3:293. doi: 10.3389/fmicb.2012.00293

3. **Shapiro, O. H.**, **R. Hatzenpichler,** D. H. Buckley, S. H. Zinder, V. J. Orphan (2010) Multicellular photo-magnetotactic bacteria. *Environmental Microbiology Reports.* 3:233. doi:10.1111/j.1758-2229.2010.00215.x

4. **Bräuer SL, Vuono D, Carmichael MJ, Pepe-Ranney C, Strom A, Rabinowitz E,** Buckley DH, Zinder SH (2014) *Microbial sequencing analyses suggest the presence of a fecal veneer on indoor climbing wall holds.* **Curr Microbiol** 69:681-9. doi: 10.1007/s00284-014-0643-3

5. **Wilbanks EG, Jaekel U, Salman V, Humphrey PT,** Eisen JA, Facciotti MT, Buckley DH, Zinder SH, Druschel GK, Fike DA, Orphan VJ (2014) *Microscale sulfur cycling in the phototrophic pink berry consortia of the Sippewissett Salt Marsh.* **Environ Microbiol** doi: 10.1111/1462-2920.12388.

6. **Shapiro O. H., R. Hatzenpichler**, D. H. Buckley, S. H. Zinder, and V. J. Orphan. 2010. Multicellular photo-magnetotactic bacteria. Envir. Microbiol. Rept. DOI: 10.1111/j.1758-2229.2010.00215.

7. **Mariita RM**, Bhatnagar S, Hanselmann K, Hossain MJ, Korlach J, Boitano M, Roberts RJ, Liles MR, Moss AG, Leadbetter JR, Newman DK, and SC Dawson (2015). *Complete Genome Sequence of Streptomyces sp. Strain CCM_MD2014, isolated from topsoil in Woods Hole, Massachusetts.* **Genome Announc** 2015 3(6) pii: e01506-15. doi: 10.1128/genomeA.01506-15. PMID: 26722012

8. **Mariita RM**, Bhatnagar S, Hanselmann K, Hossain MJ, Korlach J, Boitano M, Roberts RJ, Liles MR, Moss AG, Leadbetter JR, Newman DK, and SC Dawson SC (2015). *Complete Genome Sequence of Curtobacterium sp. Strain MR_MD2014, Isolated from Topsoil in Woods Hole, Massachusetts.* **Genome Announc** 3(6) pii: e01504-15. doi: 10.1128/genomeA.01504-15. PMID: 26722011

9. **Salman V, Yang T**, **Berben T**, Klein F, Angert E, and A Teske (2015). *Calcite-accumulating large sulfur bacteria of the genus Achromatium in Sippewissett Salt Marsh.* **ISME J**

9(11):2503-14. doi: 10.1038/ismej.2015.62. PMID: 25909974. [Salman was a postdoctoral member of the course staff for two successive summers, overseeing student research while contributing her own bench discoveries].

Meetings at which students and early career TA staff presented posters of platform talks on the results of their special research projects:

1. **Petroff**, A., D. H. Buckley, V. Orphan, S. Zinder. (2010). Metabolic Scaling Laws for Macroscopic Sulfur-oxidizing Aggregates. Published in the Proceedings of the 110th General Meeting of the American Society of Microbiology.

2. **Hasegawa**, **Y.,** S. H. Zinder, D. H. Buckley, A. Price-Whelan, H. Cadillo-Quiroz, V. J. Orphan. (2010). Characterization of Deep-sea Microbial Activities in a Whale-fall Sediment. Published in the Proceedings of the 110th General Meeting of the American Society of Microbiology.

3. **Shapiro**, **O. H.,** R. Hatzenpichler, D. H. Buckley, S. H. Zinder, V. J. Orphan (2010). Multicellular Photo-magnetotactic Bacteria. Published in the Proceedings of the 110th General Meeting of the American Society of Microbiology.

4. **J. E. Berleman**, V. Orphan, D. Buckley, S. Zinder. (2010). Sustained Bioluminescence of *Allivibrio fischeri* Through Co-culturing with a Metabolic Partner. Published in the Proceedings of the 110th General Meeting of the American Society of Microbiology.

5. **P. Balskus**, D. H. Buckley, V. J. Orphan, S. H. Zinder. (2010). Searching for Small-Molecule-Mediated Extracellular Redox in Terrestrial and Marine Microorganisms. Published in the Proceedings of the 110th General Meeting of the American Society of Microbiology.

6. **Singer, E.,** Zinder, S.H., Buckley, D.H. (2011). Coupled Magnetophototaxis in Many-celled Magnetotactic Bacteria. Published in the Proceedings of the 111th General Meeting of the American Society of Microbiology.

7. **Wilbanks, E. G., U. Jaekel, P. T. Humphrey,** C. Moraru, R. Ward, S. H. Zinder, D. H. Buckley, V. J. Orphan (2011). Pink Microbial Aggregates of the Sippewissett Salt Marsh: A Sulfurous Symbiosis. Published in the Proceedings of the 111th General Meeting of the American Society of Microbiology.

8. **Humphrey, P.T., Wilbanks, E. G., Jaekel, U.,** Moraru, C., Ward, R., Zinder, S. H., Buckley, D. H. , Orphan, V. J. (2011). Sticking Together: Community Structure and Function of Pink & Green "Berry" Salt Marsh Microbial Consortia. Published in the Proceedings of the 111th General Meeting of the American Society of Microbiology.

9. **Xu, Y.** (2011). Stable Isotope Probing of DNA in Methanotrophs in Soil. Published in the Proceedings of the 111th General Meeting of the American Society of Microbiology.

10. **Shade, A.,** Buckley, D.H., Zinder S.H. (2012). The Kombucha biofilm: A model system for microbial ecology. Published in the Proceedings of the 112th General Meeting of the American Society of Microbiology.

11. **D. H. Buckley,** S. H. Zinder Patterns of Phylogenetic and Functional Diversity in a Salt Marsh Microbial Mat. (2012). Published in the Proceedings of the 112th General Meeting of the American Society of Microbiology.

12. **Ma, P.,** Buckley, D.H., Zinder S.H. (2012).The Purple Non-sulfur Bacterium *Rhodopseudomonas palustris* Strain TIE-1 Displays Circadian Clock Properties upon Oxygen Entrainment. Published in the Proceedings of the Annual Meeting of the Society for Research on Biological Rhythms.

13. **Youngblut, N., Gallager, K.,** Buckley D.H., Zinder S.H. (2012). *Ammonia Oxidation In The Great Sippewissett Salt Marsh: Who, Where, And When?* Published in the Proceedings of the 112th General Meeting of the American Society of Microbiology.

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