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RPPR Final Report

as of 10-Apr-2020

Agency Code:

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Agreement Number: W911NF-19-1-0145

INVESTIGATOR(S):

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Principal: Y

Organization: **Gordon Research Conferences, Inc.**

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Country: USA

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Report Date: 31-Dec-2019

Date Received: 10-Apr-2020

Final Report for Period Beginning 01-Mar-2019 and Ending 30-Sep-2019

Title: 2019 Applied & Environmental Microbiology Gordon Research Conference & Seminar

Begin Performance Period: 01-Mar-2019

End Performance Period: 30-Sep-2019

Report Term: 0-Other

Submitted By: Ph.D. Nancy Gray

Email: grants@grc.org

Phone: (401) 360-1505

Distribution Statement: 1-Approved for public release; distribution is unlimited.

STEM Degrees: 0

STEM Participants: 50

Major Goals: The main goals of the Applied and Environmental Microbiology Gordon Research Conference are to provide an open forum for the presentation and discussion of the latest research findings on industrial and applied applications of microorganisms at the single cell and ecosystem level. The 2019 conference will address one of the most urgent questions in microbiology: How can we employ what we have learned from co-evolution of Earth with microbial life to address current challenges of the Anthropocene? Microbiomes impact nearly all (eco) systems on Earth. They govern the health and fitness of macrobes, including us, by forming "superorganisms". It is only through an improved understanding of this co-evolution, the languages that govern the interactions, as well as community dynamics that we will be able to predict and control microbiomes for important environmental and human outcomes.

Accomplishments: The 2019 Applied and Environmental Microbiology (AEM) Conference addressed one of the most urgent questions in microbiology: How can we employ what we have learned from the co-evolution of Earth with microbial life to address current challenges of the Anthropocene? Microbiomes impact nearly all (eco)systems on Earth. They govern the health and fitness of macrobes, including us, by forming "superorganisms". It is only through an improved understanding of this co-evolution, the languages that govern the interactions, as well as community dynamics that we will be able to predict and control microbiomes for important environmental and human outcomes.

As with previous AEM Conferences, 2019 provided an open forum for the presentation and discussion of the latest research findings on the ecology and industrial applications of microorganisms in a broad spectrum of natural, industrial, and clinical environments. Together we addressed scales ranging from the single cell to highly complex (eco)systems and embracing a diverse range of research areas, including synthetic biology, ecophysiology, postgenomic technologies, and touch upon philosophical aspects and theories for microbial ecology. Topics for each session were intentionally broad to attract scientists with a diversity of experiences, ages, approaches, and philosophies. Together we explored the inner workings of the Earth's microverse in space and time.

For a third time in succession, the GRC-AEM were happy to align with a Gordon Research Seminar (GRS). GRS-AEM 2019 addressed the mechanisms and applications of microbial languages. Microbes commonly use small molecules or metabolites to coordinate behaviors and metabolisms, assemble into simple or complex communities, or mount a defense from intruders both in natural and built environments, or in human and non-human hosts. Designed for early career scientists, a mentoring session with established and renowned scientists provided the ideal forum for exchanging knowledge, approaches, and information across disciplines and generations. The Gordon Research Seminar on Applied and Environmental Microbiology was a unique forum for early career

RPPR Final Report as of 10-Apr-2020

researchers to present their latest results, exchange cutting-edge research approaches and ideas, and network with other peer-level scientists during two oral scientific sessions and two interactive poster sessions. A mentoring session and panel discussion provide the opportunity for young scientists to use four experts from diverse areas of research as sounding boards for their own scientific interests and expectations.

This year's GRS highlighted the mechanisms and applications of microbial languages. In the natural environment, built environment, or in human and non-human hosts, microbes commonly use small molecules or metabolites to coordinate behaviors and metabolisms, assemble into simple or complex communities, or mount a defense from intruders. Discussions of novel insights into microbial communication and its wide-ranging applications from pure culture studies to health and human services or environmental functioning and response was encouraged. As one of the longest running of all Gordon Research Conferences, Applied and Environmental Microbiology (AEM) continues to provide a unique forum for discussing new approaches, technologies, and insights that advance our understanding and increase our appreciation of the oldest life forms on Earth.

Training Opportunities: Speakers, discussion leaders, poster presenters and attendees simultaneously contributed to and benefited from the collective skills and experience shared throughout the conference. The funding provided by was invaluable to the success of the Conference.

Results Dissemination: The final program has been posted on the GRC website.

Honors and Awards: Nothing to Report

Protocol Activity Status:

Technology Transfer: Nothing to Report



GORDON RESEARCH CONFERENCES

FINAL PROGRESS REPORT

Army Research Office

Applied and Environmental Microbiology GRC/GRS

Grant Number W911NF1910145

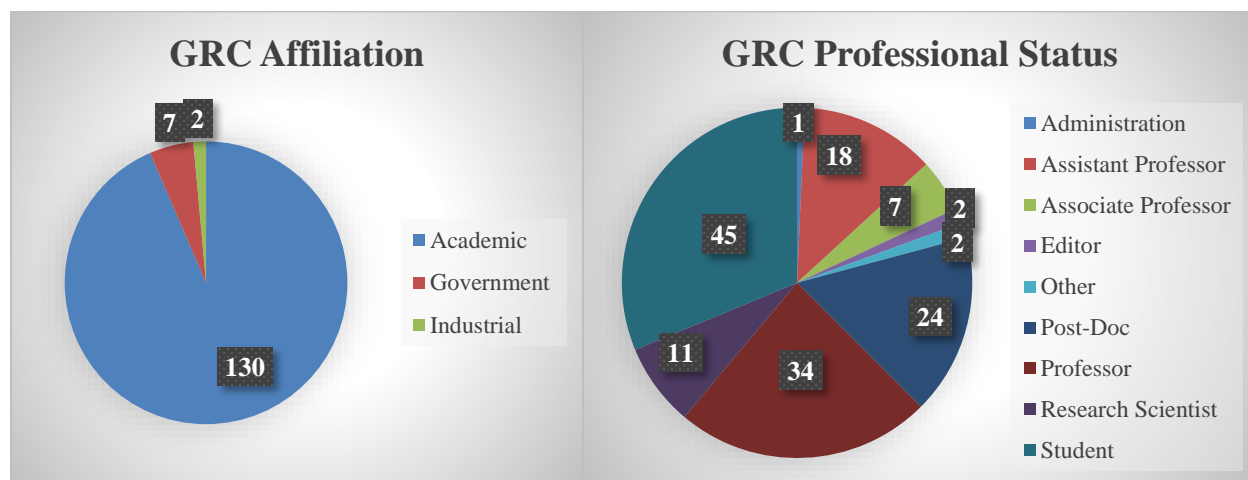
Operational Summary

The Gordon Research Conference (GRC) and Gordon Research Seminar (GRS) on Applied and Environmental Microbiology were held at the Mount Holyoke College in South Hadley, Massachusetts from July 13th-19th, 2019. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.



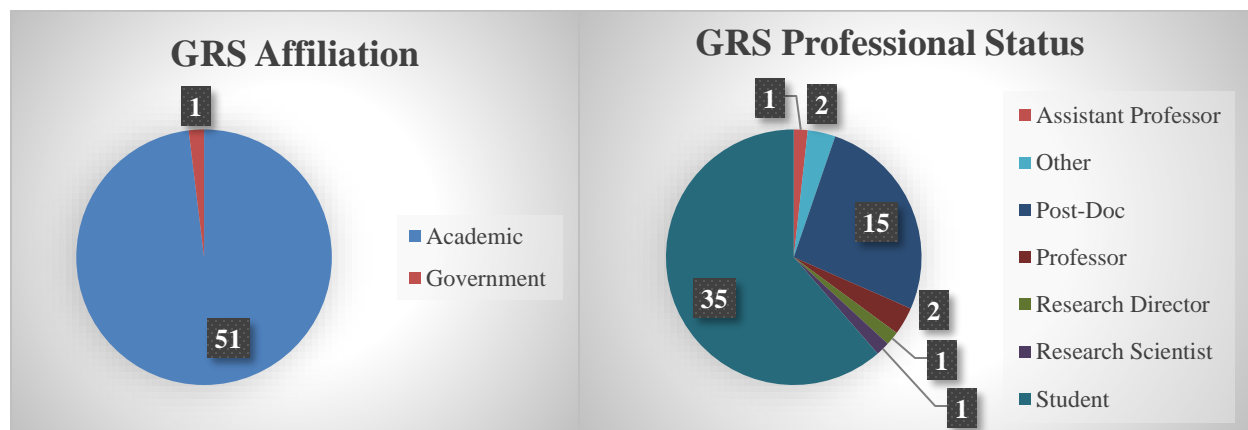
Conference Participants

The Conference was well-attended with 144 participants. Scientists from academia represented 94% of the participants while attendees from government accounted for 5% and those from industry totaled 1%. The meeting also attracted a strong mix of young investigators and senior scientists. Students and post-docs accounted for 48% of all attendees. Approximately 44% of the participants at the 2019 meeting were women.



Seminar Participants

The Seminar was well-attended with 58 participants. Scientists from academia represented 88% of the participants while attendees from government accounted for 2%. Students and post docs combined accounted for 86% of all attendees. Approximately 57% of the participants at the 2019 seminar were women.



Conference Program

The 2019 Applied and Environmental Microbiology (AEM) Conference addressed one of the most urgent questions in microbiology: How can we employ what we have learned from the co-evolution of Earth with microbial life to address current challenges of the Anthropocene? Microbiomes impact nearly all (eco)systems on Earth. They govern the health and fitness of macrobes, including us, by forming "superorganisms". It is only through an improved understanding of this co-evolution, the languages that govern the interactions, as well as community dynamics that we will be able to predict and control microbiomes for important environmental and human outcomes.

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For a third time in succession, the GRC-AEM were happy to align with a Gordon Research Seminar (GRS). GRS-AEM 2019 addressed the mechanisms and applications of microbial languages. Microbes commonly use small molecules or metabolites to coordinate behaviors and metabolisms, assemble into simple or complex communities, or mount a defense from intruders both in natural and built environments, or in human and non-human hosts. Designed for early career scientists, a mentoring session with established and renowned scientists provided the ideal forum for exchanging knowledge, approaches, and information across disciplines and generations. The Gordon Research Seminar on Applied and Environmental Microbiology was a unique forum for early career researchers to present their latest results, exchange cutting-edge research approaches and ideas, and network with other peer-level scientists during two oral scientific sessions and two interactive poster sessions. A mentoring session and panel discussion provide the opportunity for young scientists to use four experts from diverse areas of research as sounding boards for their own scientific interests and expectations.

This year's GRS highlighted the mechanisms and applications of microbial languages. In the natural environment, built environment, or in human and non-human hosts, microbes commonly use small molecules or metabolites to coordinate behaviors and metabolisms, assemble into simple or complex communities, or mount a defense from intruders. Discussions of novel insights into microbial communication and its wide-ranging applications from pure culture studies to health and human services or environmental functioning and response was encouraged. As one of the longest running of all Gordon Research Conferences, Applied and Environmental Microbiology (AEM) continues to provide a unique forum for discussing new approaches, technologies, and insights that advance our understanding and increase our appreciation of the oldest life forms on Earth.

Conference Budget

Funding provided by the Army Research Office supported partial registration for 1 research scientist, 2 associate professors, 3 assistant professors and 2 professors at the GRC and partial registration for 6 graduate students, 3 post docs and 1 research director at the GRS.

Conference Feedback

Participants had an opportunity to provide feedback at the end of the Conference. The feedback collected from the meeting was extremely positive. Evaluations included numerous positive remarks regarding the quality presentations, networking and the lengthy discussions. Evaluations from the GRS included positive comments regarding the poster presentations, interacting with peers and the talks.

GRC would like to thank the Army Research Office for its continued support of the meetings. The contributions received have been critical to the success of the conferences and are having a measurable impact in advancing the frontiers of science worldwide.

Dr. Kirsten Kusel, GRC Chair
Friedrich Schiller University Jena

Dr. Joel Kostka, GRC Vice-Chair
Georgia Institute of Technology

Dr. Christine Shulse, GRS Chair
DOE Joint Genome Institute

Dr. Will Overholt, GRS Chair
Friedrich Schiller University Jena

Dr. Nancy Ryan Gray
President and Chief Executive Officer
Gordon Research Conferences

Applied and Environmental Microbiology GRS Registration List

| Name | Organization | Participation |
|----------------------------|--|----------------------|
| Aalismail, Nojood A | King Abdullah University of Science and Technology | Poster Presenter |
| Alarcon, Hugo | University of Texas at El Paso | Attendee |
| Albright, Michaeline BN | Bioscience Division, Los Alamos National Laboratory | Discussion Leader |
| Bao, Yiqiao | Yale University | Poster Presenter |
| Brandt, Jakob | Department of Chemistry and Bioscience | Poster Presenter |
| Chakraborty, Romy | Lawrence Berkeley National Laboratory | Speaker |
| Cutcliffe, Colleen | Whole Biome Inc | Speaker |
| Dillon, Kevin P | Rutgers University | Poster Presenter |
| Duboux, Stéphane | Wageningen University Animal Sciences | Poster Presenter |
| Dutta, Avishek | Scripps Institution of Oceanography, University of California, San Diego | Poster Presenter |
| Flynn, Carrie A | Yale School of Medicine | Poster Presenter |
| Geersens, Emilie | Universite de Strasbourg | Poster Presenter |
| Geesink, Patricia | Friedrich Schiller University Jena | Poster Presenter |
| Guimarães, Helena Ipê | Unb | Poster Presenter |
| Gupta, Dinesh | Washington University in St. Louis | Poster Presenter |
| Hamilton, Richard E | San Diego State University | Poster Presenter |
| Hempel, Priscilla | University of Delaware | Speaker |
| Hernández-Terán, Alejandra | Universidad Nacional Autónoma de México | Speaker |
| Johnson, Lisa A | University of Waterloo | Poster Presenter |
| Kang, Christina S | University of Michigan | Poster Presenter |
| Karst, Søren M | Aalborg University | Poster Presenter |
| Kieft, Kristopher | University of Wisconsin-Madison | Poster Presenter |
| Kiledal, Erik Anders | University of Delaware | Poster Presenter |
| Kolton, Max | Georgia Institute of Technology | Poster Presenter |
| Kostka, Joel E | Georgia Institute of Technology | Speaker |
| Liu, Pengfei | The Wrighton Lab, Colorado State University | Poster |
| PresenterLuo, Elaine | Center for Microbial Oceanography Research and Education | Poster Presenter |
| Luxem, Katja E | Princeton University | Speaker |
| Maina, Alice Nyambura | Technical University of Kenya | Speaker |
| Mansour, Sayed Ahmed | Grand Egyptian Museum, Conservation center, Ministry of Antiquities | Poster Presenter |
| McCully, Alexandra L | Stanford University | Poster Presenter |
| Medina Cordoba, Luz K | Georgia Institute of Technology | Poster Presenter |
| Michaelsen, Thomas Y | Center for Microbial Communities | Poster Presenter |
| Mikkelsen, Deirdre | The University of Queensland | Poster Presenter |
| Murnane, Mollie E | Vedanta Biosciences | Speaker |
| Narrowe, Adrienne | Colorado State University | Poster Presenter |
| Newitt, Jake T | University of East Anglia | Poster Presenter |
| Overholt, Will A | Friedrich Schiller University Jena | Chair |
| Pérez Castro, Sherlynette | Marine Biological Laboratory | Speaker |
| Prudence, Samuel MM | University of East Anglia | Discussion Leader |
| Qiang, Liyuan | Rutgers University | Poster Presenter |
| Rimbey, Jeanette | Texas Tech University | Discussion Leader |
| Roberts, Aakansha J | Rutgers, The State University of New Jersey | Speaker |

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|----------------------------------|--|-------------------|
| Santana-Pereira, Alinne L. R. | Auburn University | Poster Presenter |
| Schada von Borzyskowski, Lennart | Max Planck Institute for Terrestrial Microbiology | Speaker |
| Schmidt, Oliver | University of Bayreuth | Discussion Leader |
| Shulse, Christine N | DOE Joint Genome Institute | Chair |
| Smith, Garrett J | Ohio State University | Speaker |
| Sun, Xiaoxu | Guangdong Institute of Eco-Environmental Science and Technology | Poster Presenter |
| Taubert, Martin | Friedrich Schiller University Jena | Poster Presenter |
| Tveit, Alexander T | UiT, The Arctic University of Norway | Speaker |
| Viljakainen, Veronica R | University of Waterloo | Poster Presenter |
| Wang, Zhao | Duke University | Speaker |
| Yaniv, Karin | Ben-Gurion University of the Negev | Speaker |
| Zeliph, Michelle | Rutgers University | Poster Presenter |
| Zengler, Karsten | University of California, San Diego | Speaker |
| Zhang, An-Ni | Massachusetts Institute of Technology | Poster Presenter |
| Zhou, Nanqing | University of Delaware | Poster Presenter |
| 58 Attendees | | |

Applied and Environmental Microbiology GRC Registration List

| Name | Organization | Participation |
|--------------------------|--|----------------------|
| Aalismail, Nojood A | King Abdullah University of Science and Technology | Poster Presenter |
| Akob, Denise M | U.S. Geological Survey | Poster Presenter |
| Alarcon, Hugo | University of Texas at El Paso | Poster Presenter |
| Albertsen, Mads | Center for Microbial Communities, Aalborg University | Speaker |
| Albright, Michaeline BN | Bioscience Division, Los Alamos National Laboratory | Speaker |
| Ash, Caroline P | Science magazine | Attendee |
| Baer, Jason L | San Diego State University | Poster Presenter |
| Bao, Yiqiao | Yale University | Poster Presenter |
| Ben Tekaya, Seifeddine B | University of Wyoming | Attendee |
| Bos, Kirsten | Max Planck Institute for the Science of Human History | Speaker |
| Brandt, Jakob | Department of Chemistry and Bioscience | Poster Presenter |
| Breithaupt, Holger M | EMBO | Attendee |
| Bridges, Andrew | Princeton University | Poster Presenter |
| Cash, Kevin J | Colorado School of Mines | Poster Presenter |
| Choi, Hannah A | University of Georgia | Poster Presenter |
| Crowe, Sean A. | Hong Kong University, Hong Kong SAR China / The University of British Columbia | Speaker |
| Curtis, Thomas P | Newcastle University | Discussion Leader |
| Daniel, Steven L | Eastern Illinois University | Discussion Leader |
| DePriest, Miranda N | The Pennsylvania State University | Poster Presenter |
| Dillon, Kevin P | Rutgers University | Poster Presenter |
| Drake, Harold L | University of Bayreuth | Speaker |
| Duboux, Stéphane | Wageningen University Animal Sciences | Poster Presenter |
| Dukes, Helen | University of Georgia | Poster Presenter |
| Dutta, Avishek | Scripps Institution of Oceanography, University of California, San Diego | Poster Presenter |
| Dzunkova, Maria | DOE Joint Genome Institute | Speaker |
| Emerson, David | Bigelow Laboratory | Poster Presenter |
| Faust, Karoline | KU Leuven | Speaker |
| Garcia Costas, Amaya M | Colorado State University | Poster Presenter |
| Geersens, Emilie | Universite de Strasbourg | Poster Presenter |
| Geesink, Patricia | Friedrich Schiller University Jena | Poster Presenter |
| Gibbons, Henry S. | US Army Combat Capabilities Development Command - Chemical Biological Center | Poster Presenter |
| Gibbs, Karine A | Harvard University | Speaker |
| Gong, Xianzhe | University of Texas at Austin | Poster Presenter |
| Guimarães, Helena Ipê | Unb | Poster Presenter |
| Gupta, Dinesh | Washington University in St. Louis | Poster Presenter |
| Haggblom, Max | Rutgers University | Poster Presenter |
| Hamilton, Richard E | San Diego State University | Poster Presenter |
| Han, Heejoo | Korea Advanced Institute of Science and Technology | Poster Presenter |
| Hatzenpichler, Roland | Montana State University | Discussion Leader |
| Hempel, Priscilla | University of Delaware | Poster Presenter |
| Hernandez, Rafael J | Stony Brook University School of Medicine | Poster Presenter |
| Hernández-Terán, A | Universidad Nacional Autónoma de México | Poster Presenter |
| Horn, Marcus A. | Leibniz University Hannover | Poster Presenter |

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|-------------------------|---|-------------------|
| Hutchings, Matthew I | University of East Anglia | Speaker |
| Isemonger, Eric W | Rhodes University | Poster Presenter |
| Jameson, Eleanor | The University of Warwick | Poster Presenter |
| Johnson, Lisa A | University of Waterloo | Poster Presenter |
| Joye, Samantha B. | University of Georgia | Discussion Leader |
| Jurkevitch, Edouard | The Hebrew University of Jerusalem | Poster Presenter |
| Kacar, Betul | University of Arizona | Speaker |
| Kang, Christina S | University of Michigan | Poster Presenter |
| Karst, Søren M | Aalborg University | Poster Presenter |
| Kieft, Kristopher | University of Wisconsin-Madison | Poster Presenter |
| Kiledal, Erik Anders | University of Delaware | Poster Presenter |
| Kimbrel, Jeffrey | Lawrence Livermore National Laboratory | Poster Presenter |
| Kolb, Steffen | Leibniz Centre for Agricultural Landscape Research (ZALF), Humboldt University of Berlin | Poster Presenter |
| Kolton, Max | Georgia Institute of Technology | Poster Presenter |
| Konhauser, Kurt | University of Alberta | Speaker |
| Kostka, Joel E | Georgia Institute of Technology | Vice Chair |
| Krajmalnik-Brown, Rosa | Arizona State University | Speaker |
| Kruger, Ricardo H | University of Brasilia - UnB | Poster Presenter |
| Kujala, Katharina | University of Oulu | Poster Presenter |
| Kumaresan, Deepak | Queen's University Belfast | Poster Presenter |
| Kusel, Kirsten | Friedrich Schiller University Jena | Chair |
| Li, Mengyan | New Jersey Institute of Technology | Poster Presenter |
| Liu, Pengfei | The Wrighton Lab, Colorado State University | Poster Presenter |
| Lueders, Tillmann | University of Bayreuth | Speaker |
| Luo, Elaine | Center for Microbial Oceanography Research and Education | Poster Presenter |
| Luxem, Katja E | Princeton University | Poster Presenter |
| Maan, Harsh | Weizmann Institute of Science | Poster Presenter |
| Maina, Alice Nyambura | Technical University of Kenya | Poster Presenter |
| Makhalanyane, Thulani P | University of Pretoria | Speaker |
| Mann, Francis M | University of Wisconsin-Parkside | Poster Presenter |
| Mansour, Sayed Ahmed | Grand Egyptian Museum, Conservation center, Ministry of Antiquities | Poster Presenter |
| Maresca, Julia A | University of Delaware | Poster Presenter |
| McCully, Alexandra L | Stanford University | Poster Presenter |
| Medina, Monica | Pennsylvania State University | Speaker |
| Medina Cordoba, Luz K | Georgia Institute of Technology | Poster Presenter |
| Michaelsen, Thomas Y | Center for Microbial Communities | Poster Presenter |
| Mikkelsen, Deirdre | The University of Queensland | Poster Presenter |
| Mills, David Andrew | University of California, Davis | Speaker |
| Mizrahi, Itzhak | Ben Gurion University of the Negev | Discussion Leader |
| Morozov, Aleksey | Marine Biological Laboratory, Bay Paul Center | Attendee |
| Murrell, J. Colin | University of East Anglia | Speaker |
| Narrowe, Adrienne | Colorado State University | Poster Presenter |
| Newitt, Jake T | University of East Anglia | Poster Presenter |
| O'Malley, Maureen | University of Sydney | Speaker |
| Obulisamy, Parthiba K | University of Michigan | Poster Presenter |
| Ogata, Hiroyuki | Institute for Chemical Research, Kyoto University | Speaker |
| Overholt, Will A | Friedrich Schiller University Jena | Speaker |

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|----------------------------|---|-------------------|
| Pérez Castro, Sherlynette | Marine Biological Laboratory | Poster Presenter |
| Petersen, Jillian M | University of Vienna | Speaker |
| Prakash, Divya | The Pennsylvania State University | Poster Presenter |
| Prudence, Samuel MM | University of East Anglia | Poster Presenter |
| Qiang, Liyuan | Rutgers University | Poster Presenter |
| Quaiyum, Samia | Hokkaido University | Poster Presenter |
| Ran, Noya | Ben Gurion University | Poster Presenter |
| Reid, Anne N | Salve Regina University | Poster Presenter |
| Rimbey, Jeanette | Texas Tech University | Poster Presenter |
| Roberts, Aakansha J | Rutgers, The State University of New Jersey | Poster Presenter |
| Rodriguez-Valera, F | Universidad Miguel Hernandez | Speaker |
| Ronen, Zeev | Ben Gurion University | Poster Presenter |
| Ruff, S. Emil | Marine Biological Laboratory | Poster Presenter |
| Sadowsky, Michael J | University of Minnesota | Discussion Leader |
| Samo, Ty J | Lawrence Livermore National Laboratory | Poster Presenter |
| Santana-Pereira, Alinne | Auburn University | Poster Presenter |
| Schada von Borzyskowski, L | Max Planck Institute for Terrestrial Microbiology | Poster Presenter |
| Schmidt, Oliver | University of Bayreuth | Poster Presenter |
| Schramm, Andreas | Aarhus University | Speaker |
| Semrau, Jeremy D | University of Michigan | Poster Presenter |
| Shade, Ashley | Michigan State University | Speaker |
| Shulse, Christine N | DOE Joint Genome Institute | Speaker |
| Smith, Thomas J | Sheffield Hallam University | Poster Presenter |
| Smith, Garrett J | Ohio State University | Poster Presenter |
| Stegen, James C | Pacific Northwest National Laboratory | Speaker |
| Sun, Xiaoxu | Guangdong Institute of Eco-Environmental Science and Technology | Poster Presenter |
| Sun, Weimin | Guangdong Institute of Eco-environmental Science & Technology | Poster Presenter |
| Taubert, Martin | Friedrich Schiller University Jena | Poster Presenter |
| Thompson, Fabiano L | Universidade Federal do Rio de Janeiro | Speaker |
| Tveit, Alexander T | UiT, The Arctic University of Norway | Poster Presenter |
| Ver Eecke, Helene C | Metropolitan State University of Denver | Poster Presenter |
| Viljakainen, Veronica R | University of Waterloo | Poster Presenter |
| Voytek, Mary A | National Aeronautics and Space Administration | Discussion Leader |
| Vuilleumier, Stephane | Université de Strasbourg | Attendee |
| Wagner-Doebler, Irene | Technical University of Braunschweig | Poster Presenter |
| Walsh, David A | Concordia University | Poster Presenter |
| Wang, Zhao | Duke University | Poster Presenter |
| Wetter Slack, Emma M | ETH Zurich | Speaker |
| Whited, Gregg M | Dupont Industrial Biosciences | Attendee |
| Wommack, K. Eric | University of Delaware | Discussion Leader |
| Woodcroft, Benjamin J | The University of Queensland | Speaker |
| Xu, Shuang-yong | New England Biolabs, Inc. | Poster Presenter |
| Yaniv, Karin | Ben-Gurion University of the Negev | Poster Presenter |
| Yoon, Sukhwan | Korea Advanced Institute of Science and Technology | Poster Presenter |
| You, Yaqi | Idaho State University | Poster Presenter |
| Zeibich, Lydia | Department of Ecological Microbiology | Poster Presenter |
| Zeliph, Michelle | Rutgers University | Poster Presenter |
| Zengler, Karsten | University of California, San Diego | Speaker |

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|----------------------|---------------------------------------|------------------|
| Zhang, An-Ni | Massachusetts Institute of Technology | Speaker |
| Zhang, Tong | The University of Hong Kong | Speaker |
| Zhang, Ying | University of Rhode Island | Poster Presenter |
| Zhang, Xinning | Princeton University | Poster Presenter |
| Zhao, Weishu | University of Rhode Island | Poster Presenter |
| Zhou, Nanqing | University of Delaware | Poster Presenter |
| 144 Attendees | | |

Applied and Environmental Microbiology
Gordon Research Seminar

Microbial Language: Microbes, Molecules and Metabolites

July 13 - 14, 2019

Chairs Christine N. Shulse and Will A. Overholt

Conference Program

Saturday

| | |
|-------------------|--|
| 2:00 pm - 5:00 pm | Arrival and Check-in |
| 3:30 pm - 3:45 pm | Introductory Comments by GRC Site Staff / Welcome from the GRS Chair |
| 3:45 pm - 4:30 pm | Keynote Session: Translating the Microbiome Discussion Leader: Jeanette Rimbey (Texas Tech University, USA) |
| 3:45 pm - 4:15 pm | Colleen Cutcliffe (Whole Biome Inc, USA) "Whole Biome: Translating the Microbiome" |
| 4:15 pm - 4:30 pm | Discussion |
| 4:30 pm - 6:00 pm | Poster Session |
| 6:00 pm - 7:00 pm | Dinner |
| 7:30 pm - 9:30 pm | Harnessing Microbial Language to Solve the Problems of the Anthropocene Discussion Leader: Michaeline Albright (Bioscience Division, Los Alamos National Laboratory, USA) |
| 7:30 pm - 7:45 pm | Lina Gonzalez (Massachusetts Institute of Technology, USA) "Resilient Living Materials Built by Printing Bacterial Spores" |
| 7:45 pm - 7:50 pm | Discussion |
| 7:50 pm - 8:05 pm | Alexander Tveit (UiT, The Arctic University of Norway, Norway) "Living on Air: A Widespread Bacterium that Grows at Atmospheric Methane Concentration" |
| 8:05 pm - 8:10 pm | Discussion |
| 8:10 pm - 8:25 pm | Katja Luxem (Princeton University, USA) "Large Hydrogen Isotope Fractionation Distinguishes Nitrogenase-Derived Methane from Other Sources" |
| 8:25 pm - 8:30 pm | Discussion |
| 8:30 pm - 8:45 pm | Zhao Wang (Duke University, USA) "Marine Microbial Population and Community Responses to the Climate Change Parameters: pH and Temperature" |
| 8:45 pm - 8:50 pm | Discussion |
| 8:50 pm - 9:05 pm | Alice Maina (Technical University of Kenya, Kenya) " <i>Vibrio cholerae</i> Bacteriophages Isolated from the Environmental Waters of Kenya as Biocontrol Against the Pathogen" |
| 9:05 pm - 9:10 pm | Discussion |
| 9:10 pm - 9:25 pm | Aakansha Roberts (Rutgers, The State University of New Jersey, USA) |

"Characterization of a *Pseudomonas* Integrative and Conjugative Element for Diphenylmethane and Biphenyl Degradation"

9:25 pm - 9:30 pm Discussion

Sunday

7:30 am - 8:30 am Breakfast

9:00 am - 11:00 am **Discovering the Microbial Rosetta Stone**
Discussion Leader: **Oliver Schmidt** (University of Bayreuth, Germany)

9:00 am - 9:15 am **Alejandra Hernández-Terán** (Universidad Nacional Autónoma de México, Mexico)
"Structure and Variation of the Rhizosphere Microbiome in Wild Metapopulations of Cotton in Mexico"

9:15 am - 9:20 am Discussion

9:20 am - 9:35 am **Priscilla Hempel** (University of Delaware, USA)
"Transcriptomic Response of Heterotrophic Freshwater Actinobacteria to Light"

9:35 am - 9:40 am Discussion

9:40 am - 9:55 am **Garrett Smith** (Ohio State University, USA)
"Metabolic Exchanges Influenced by Organic Nitrogen and Carbon Inputs Drive Biogeochemical Cycling in Columbia River Sediments"

9:55 am - 10:00 am Discussion

10:00 am - 10:15 am **Sherlynette Pérez Castro** (Marine Biological Laboratory, USA)
"Microbial Community Dynamics and Coexistence in a Sulfide-Driven Phototrophic Bloom"

10:15 am - 10:20 am Discussion

10:20 am - 10:35 am **Karin Yaniv** (Ben-Gurion University of the Negev, Israel)
"Using Functional Screening of Environmental Metagenomic Libraries for Anti-Quorum Sensing Compounds as a Platform for Microbial Ecology Study and Drug Discovery"

10:35 am - 10:40 am Discussion

10:40 am - 10:55 am **Lennart Schada von Borzyskowski** (Max Planck Institute for Terrestrial Microbiology, Germany)
"Rediscovery of the Beta-Hydroxyaspartate Cycle Closes a Gap in the Marine Carbon Cycle"

10:55 am - 11:00 am Discussion

11:00 am - 12:30 pm **Poster Session**
Coffee will be served in the poster area from 11:00 am - 11:30 am

12:30 pm - 1:30 pm Lunch

1:30 pm - 2:30 pm **Mentorship Component: Career Panel**
Discussion Leader: **Samuel Prudence** (University of East Anglia, United Kingdom)

1:30 pm - 2:30 pm **Panel Discussion**
Building a Career in Microbiology: Perspectives for Academia, Government and Industry

- **Romy Chakraborty** (Lawrence Berkeley National Laboratory, USA)
- **Joel Kostka** (Georgia Institute of Technology, USA)
- **Mollie Murnane** (Vedanta Biosciences, USA)
- **Karsten Zengler** (University of California, San Diego, USA)

2:30 pm - 3:00 pm

Evaluation Period

Fill in GRS Evaluation Forms

3:00 pm

Seminar Concludes

Contributors



Carl Storm
International
Diversity
Fellowship Program



iDiv

German Centre for Integrative
Biodiversity Research (iDiv)
Halle-Jena-Leipzig



**MICROBIOLOGY
SOCIETY**

Applied and Environmental Microbiology
Gordon Research Conference

Shaping the Earth's Microverse

July 14 - 19, 2019
Chair Kirsten Kusel

Vice Chair Joel E. Kostka

Conference Program

Sunday

| | |
|-------------------|--|
| 2:00 pm - 9:00 pm | Arrival and Check-in |
| 6:00 pm - 7:00 pm | Dinner |
| 7:30 pm - 7:40 pm | Introductory Comments by GRC Site Staff / Welcome from the GRC Chair |
| 7:40 pm - 9:30 pm | Keynote Session: Origin of Life <i>What we know about how we got here!</i> Discussion Leader: Mary Voytek (National Aeronautics and Space Administration, USA) |
| 7:40 pm - 7:55 pm | Opening Remarks |
| 7:55 pm - 8:10 pm | Introduction by Discussion Leader |
| 8:10 pm - 8:40 pm | Kurt Konhauser (University of Alberta, Canada) "Conditions on the Archean Earth and Evolution of Photoferrotrophy" |
| 8:40 pm - 8:55 pm | Discussion |
| 8:55 pm - 9:20 pm | Betul Kacar (University of Arizona, USA) "Reconstructed Enzymes as Proxies for Ancient Biogeochemical Intermediaries" |
| 9:20 pm - 9:30 pm | Discussion |

Monday

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|---------------------|--|
| 7:30 am - 8:30 am | Breakfast |
| 8:30 am - 9:00 am | Group Photo |
| 9:00 am - 12:30 pm | Co-Evolution of the Geosphere and Biosphere Discussion Leader: Joel Kostka (Georgia Institute of Technology, USA) |
| 9:00 am - 9:15 am | Introduction by Discussion Leader |
| 9:15 am - 9:40 am | Sean Crowe (Hong Kong University, Hong Kong SAR China / The University of British Columbia, Canada) "Microbial Responses to Ocean Deoxygenation" |
| 9:40 am - 9:50 am | Discussion |
| 9:50 am - 10:15 am | Tillmann Lueders (University of Bayreuth, Germany) "Snot or Not? Linking Bio- and Geosphere in a Methane-Rich Iodine Spring" |
| 10:15 am - 10:25 am | Discussion |
| 10:25 am - 10:55 am | Coffee Break |
| 10:55 am - 11:15 am | Will Overholt (Friedrich Schiller University Jena, Germany) "Microbial Drivers Fueling Carbon Flow in Groundwater" |

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| 11:15 am - 11:25 am | Discussion |
| 11:25 am - 11:50 am | Thulani Makhwanyane (University of Pretoria, South Africa) "Microbial Co-Evolution and Biogeochemistry in Terrestrial Arid Zones" |
| 11:50 am - 12:00 pm | Discussion |
| 12:00 pm - 12:30 pm | Poster Previews |
| 12:30 pm - 1:30 pm | Lunch |
| 1:30 pm - 4:00 pm | Free Time |
| 3:00 pm - 4:00 pm | The GRC Power Hour™ <i>The GRC Power Hour™ is designed to address challenges women face in science and issues of diversity and inclusion.</i> <i>The program supports the professional growth of all members of our communities by providing an open forum for discussion and mentoring.</i> Organizer: Denise Akob (U.S. Geological Survey, USA) |
| 4:00 pm - 6:00 pm | Poster Session |
| 6:00 pm - 7:00 pm | Dinner |
| 7:30 pm - 9:30 pm | Viral Ecology: The Power of the Smallest Organisms Discussion Leader: K. Eric Wommack (University of Delaware, USA) |
| 7:30 pm - 7:45 pm | Introduction by Discussion Leader |
| 7:45 pm - 8:10 pm | Maria Dzunkova (DOE Joint Genome Institute, USA) "Linking Phages with Their Hosts by Viral Tagging" |
| 8:10 pm - 8:20 pm | Discussion |
| 8:20 pm - 8:45 pm | Hiroyuki Ogata (Institute for Chemical Research, Kyoto University, Japan) "Do Viruses Enhance the Carbon Export Down to the Deep Ocean?" |
| 8:45 pm - 8:55 pm | Discussion |
| 8:55 pm - 9:20 pm | Francisco Rodriguez-Valera (Universidad Miguel Hernandez, Spain) "Metagenomes of Marine Phages" |
| 9:20 pm - 9:30 pm | Discussion |
| Tuesday | |
| 7:30 am - 8:30 am | Breakfast |
| 9:00 am - 12:30 pm | Ecology and Evolution of Superorganisms Discussion Leader: Itzhak Mizrahi (Ben Gurion University of the Negev, Israel) |
| 9:00 am - 9:15 am | Introduction by Discussion Leader |
| 9:15 am - 9:40 am | Jillian Petersen (University of Vienna, Austria) "400 Million Years of Symbiosis: Ecology and Evolution of the Ancient Symbiosis Between Marine Clams and Their Sulfur-Oxidizing Endosymbionts" |
| 9:40 am - 9:50 am | Discussion |
| 9:50 am - 10:15 am | Monica Medina (Pennsylvania State University, USA) |

"Microbial-Host Codevelopment in the Upside Down Jellyfish *Cassiopea xamachana*"

10:15 am - 10:25 am Discussion

10:25 am - 10:55 am Coffee Break

10:55 am - 11:15 am **An-Ni Zhang** (Massachusetts Institute of Technology, USA)
"Environmental Selection Drive Functional Convergence but Not Population Convergence in Human Gut"

11:15 am - 11:20 am Discussion

11:20 am - 11:45 am **Matthew Hutchings** (University of East Anglia, United Kingdom)
"Chemical Warfare in the Nests of Leafcutter Ants"

11:45 am - 11:55 am Discussion

11:55 am - 12:20 pm **Kirsten Bos** (Max Planck Institute for the Science of Human History, Germany)
"Infectious Disease History as Revealed Through Ancient Pathogens"

12:20 pm - 12:30 pm Discussion

12:30 pm - 1:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm **Poster Session**

6:00 pm - 7:00 pm Dinner

7:30 pm - 9:30 pm **Advances and Applications of Human Microbiome Research**
Discussion Leader: **Michael Sadowsky** (University of Minnesota, USA)

7:30 pm - 7:45 pm Introduction by Discussion Leader

7:45 pm - 8:10 pm **David Mills** (University of California, Davis, USA)
"The Role of Milk Oligosaccharides in the Development, Persistence and Function of the Breast Fed Infant Gut Microbiome"

8:10 pm - 8:20 pm Discussion

8:20 pm - 8:45 pm **Rosa Krajmalnik-Brown** (Arizona State University, USA)
"Can Changing Gut Bacterial Communities Improve Gastrointestinal and Autism Symptoms?"

8:45 pm - 8:55 pm Discussion

8:55 pm - 9:20 pm **Emma Wetter Slack** (ETH Zurich, Switzerland)
"What Role Does the Immune System Play in Controlling Your Intestinal Microbiota?"

9:20 pm - 9:30 pm Discussion

Wednesday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Insights into Microbial Species Interactions**
Discussion Leader: **Roland Hatzenpichler** (Montana State University, USA)

9:00 am - 9:15 am Introduction by Discussion Leader

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|---------------------|---|
| 9:15 am - 9:40 am | Mads Albertsen (Center for Microbial Communities, Aalborg University, Denmark) "Towards a Fully Populated Tree of Life" |
| 9:40 am - 9:50 am | Discussion |
| 9:50 am - 10:15 am | Karoline Faust (KU Leuven, Belgium) "Emergent Behavior in a Synthetic Gut Community" |
| 10:15 am - 10:25 am | Discussion |
| 10:25 am - 10:55 am | Coffee Break |
| 10:55 am - 11:20 am | Karine Gibbs (Harvard University, USA) "Surface-Surfing with a Few Million Friends: How Kin-Specific Identity Information Modulates the Emergent Behaviors of a Bacterial Swarm" |
| 11:20 am - 11:30 am | Discussion |
| 11:30 am - 11:55 am | Karsten Zengler (University of California, San Diego, USA) "The Social Network of Microbes and How to Unravel the Complex Interactions Within" |
| 11:55 am - 12:05 pm | Discussion |
| 12:05 pm - 12:30 pm | Poster Previews |
| 12:30 pm - 1:30 pm | Lunch |
| 1:30 pm - 4:00 pm | Free Time |
| 4:00 pm - 6:00 pm | Poster Session |
| 6:00 pm - 7:00 pm | Dinner |
| 7:00 pm - 7:30 pm | Business Meeting <i>Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair</i> |
| 7:30 pm - 9:30 pm | Linking Microbial Physiology to Ecosystem Functions Discussion Leader: Steven Daniel (Eastern Illinois University, USA) |
| 7:30 pm - 7:45 pm | Introduction by Discussion Leader |
| 7:45 pm - 8:10 pm | J. Colin Murrell (University of East Anglia, United Kingdom) "Microbial Degradation of Isoprene, a Much Neglected Atmospheric Trace Gas" |
| 8:10 pm - 8:20 pm | Discussion |
| 8:20 pm - 8:45 pm | Andreas Schramm (Aarhus University, Denmark) "Ecophysiology and Interactions of Electrically-Conductive Cable Bacteria" |
| 8:45 pm - 8:55 pm | Discussion |
| 8:55 pm - 9:20 pm | Harold Drake (University of Bayreuth, Germany) "Darwin's Invertebrates: The Oldest Gut Ecosystem and Why It's Still Here" |
| 9:20 pm - 9:30 pm | Discussion |

Thursday

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| 7:30 am - 8:30 am | Breakfast |
| 9:00 am - 12:30 pm | The Microverse of the Anthropocene <i>Applied aspects of microbiology.</i> Discussion Leader: Samantha Joye (University of Georgia, USA) |
| 9:00 am - 9:15 am | Introduction by Discussion Leader |
| 9:15 am - 9:40 am | Benjamin Woodcroft (The University of Queensland, Australia) "Methane Cycling in Permafrost Soils" |
| 9:40 am - 9:50 am | Discussion |
| 9:50 am - 10:15 am | Tong Zhang (The University of Hong Kong, Hong Kong SAR China) "Wastewater Resistome Revealed by Metagenomics Approaches" |
| 10:15 am - 10:25 am | Discussion |
| 10:25 am - 10:55 am | Coffee Break |
| 10:55 am - 11:15 am | Christine Shulse (DOE Joint Genome Institute, USA) "Engineered Root Bacteria Release Plant Available Phosphate from Phytate" |
| 11:15 am - 11:25 am | Discussion |
| 11:25 am - 11:50 am | Fabiano Thompson (Universidade Federal do Rio de Janeiro, Brazil) "New Insights on the Great Amazon Reef" |
| 11:50 am - 12:00 pm | Discussion |
| 12:00 pm - 12:20 pm | Michaeline Albright (Bioscience Division, Los Alamos National Laboratory, USA) "Principles for Engineering Microbial Composition and Ecosystem Functioning" |
| 12:20 pm - 12:30 pm | Discussion |
| 12:30 pm - 1:30 pm | Lunch |
| 1:30 pm - 4:00 pm | Free Time |
| 4:00 pm - 6:00 pm | Poster Session |
| 6:00 pm - 7:00 pm | Dinner |
| 7:30 pm - 9:30 pm | Concepts to Understand the Earth's Microverse Discussion Leader: Thomas Curtis (Newcastle University, United Kingdom) |
| 7:30 pm - 7:45 pm | Introduction by Discussion Leader |
| 7:45 pm - 8:10 pm | Ashley Shade (Michigan State University, USA) "Resilience of Microbial Communities" |
| 8:10 pm - 8:20 pm | Discussion |
| 8:20 pm - 8:45 pm | James Stegen (Pacific Northwest National Laboratory, USA) "Extending Community Assembly Principles from Microbial Communities to Organic Molecules" |
| 8:45 pm - 8:55 pm | Discussion |
| 8:55 pm - 9:20 pm | Maureen O'Malley (University of Sydney, Australia) "Microbial Infallibility in the Metagenomic Era" |

9:20 pm - 9:30 pm Discussion

Friday

7:30 am - 8:30 am Breakfast

9:00 am Departure

Contributors

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|  <p>Gordon Research Conferences <i>Frontiers of Science</i></p> |  <p>Carl Storm Underrepresented Minority Fellowship Program</p> |
|  <p>Carl Storm International Diversity Fellowship Program</p> |  |
|  |  |
|  <p>iDiv German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig</p> |  |
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