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RPPR Final Report

as of 10-Apr-2020

Agency Code:

Proposal Number: 74914CHCF

Agreement Number: W911NF-19-1-0145

INVESTIGATOR(S):

Name: Joel Kostka

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Phone Number: 4043853325

Principal: Y

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

Address: 512 Liberty Lane, West Kingston, RI 028921502

Country: USA

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EIN: 050300482

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

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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

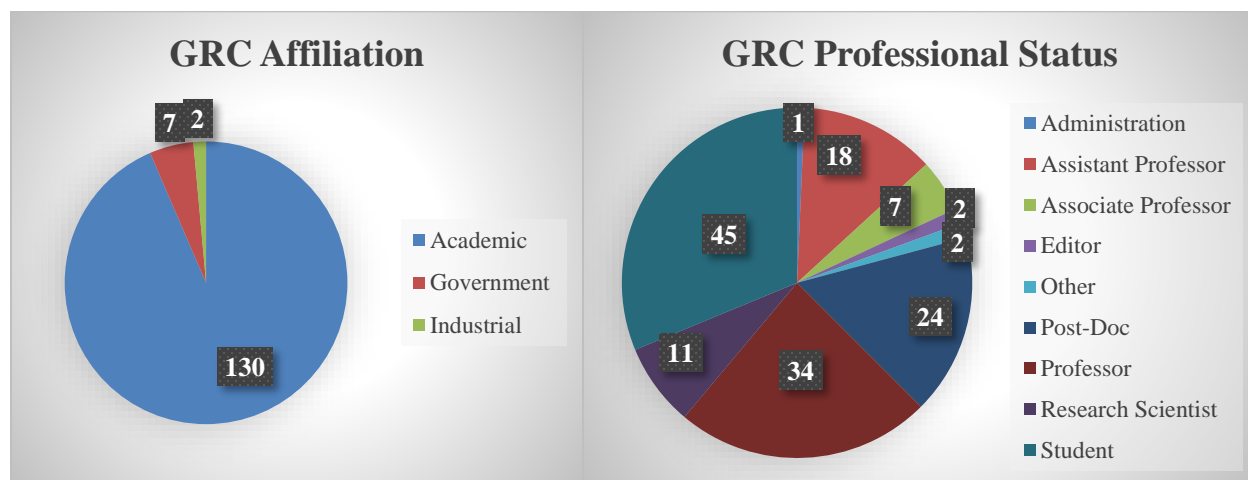
Operational Summary

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

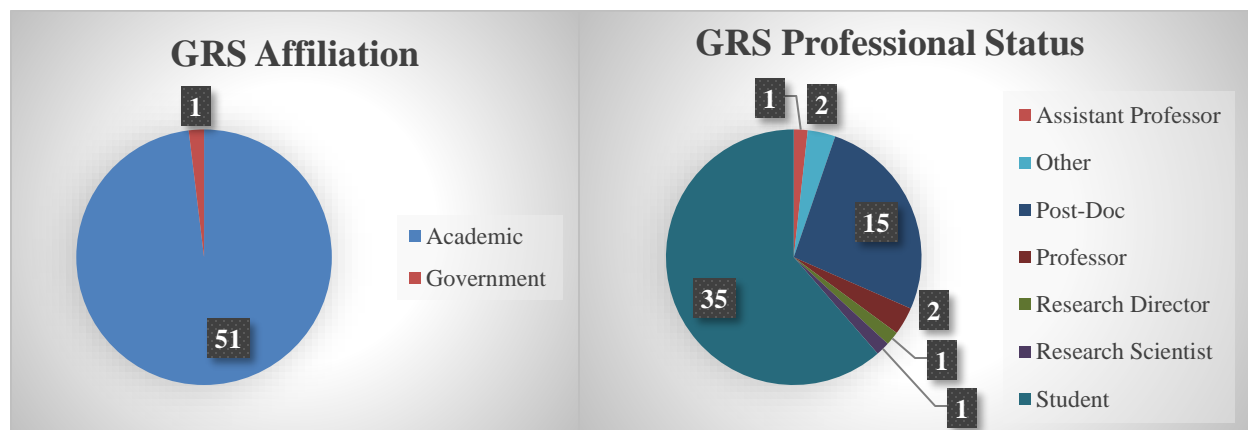
The Conference was well-attended with 144 participants. Scientists from academia represented 94% of the participants while attendees from government accounted for 5% and those from industry totaled 1%. The meeting also attracted a strong mix of young investigators and senior scientists. Students and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



Gordon Research Seminars

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.

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 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

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
Haggbloom, 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

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

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

Zhang, An-Ni

Zhang, Tong

Zhang, Ying

Zhang, Xinning

Zhao, Weishu

Zhou, Nanqing

144 Attendees

Massachusetts Institute of Technology

The University of Hong Kong

University of Rhode Island

Princeton University

University of Rhode Island

University of Delaware

Speaker

Speaker

Poster Presenter

Poster Presenter

Poster Presenter

Poster Presenter

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 <i>Pseudomonas</i> 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 <i>Coffee will be served in the poster area from 11:00 am - 11:30 am</i>
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 <i>Building a Career in Microbiology: Perspectives for Academia, Government and Industry</i> <ul style="list-style-type: none"> • 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

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"

11:15 am - 11:25 am	Discussion
11:25 am - 11:50 am	Thulani Makhalanyane (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 <i>Cassiopea xamachana</i> "
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

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	

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



**Gordon Research
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Frontiers of Science



Carl Storm
Underrepresented
Minority Fellowship
Program



Carl Storm
International
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