

Bios of Invited Speakers

Ahmed Abdelfattah



Dr. Ahmed Abdelfattah is a researcher at Stockholm University and a former postdoc at Mediterranean University of Reggio Calabria. He received his doctoral degree in 2016 from Palermo University, in Agro-forestry sciences. During his PhD and previous postdoctoral fellowship he gained extensive knowledge in microbial ecology, plant pathology, and microbiome research. His research was one of the earliest studies to decipher the microbiome of fruit crops, such as olive, orange, tangerine, strawberries, grapes, and apples.

At his current affiliation, he is focused on understanding how plant-associated microbes are transmitted between generations and how climate change may influence their community composition. Dr. Abdelfattah was recently awarded the Marie Curie fellowship, a prestigious grant funded by the European Commission, to continue his work on the apple microbiome with Prof. Gabriele Berg at Graz University of Technology www.applebiome.com.

Gabriele Berg

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https://de.wikipedia.org/wiki/Gabriele_Berg

Gabriele Berg studied biology and biotechnology at the universities in Rostock and Greifswald obtained her Ph.D. in 1995 in microbiology from Rostock University (Germany). In 2003, she got a Heisenberg grant from the DFG (Deutsche Forschungsgemeinschaft), and in 2005 she became a full professor in environmental biotechnology at Graz University of Technology (Austria). Her interests are focused on microbiome research and translation of the results into new biotechnological concepts for health issues. Results have published in more than 200 peerreviewed papers and in several patents. She received numerous awards, e.g. Science2Business Award Austria, “ÖGUT Umweltpreis” (2011) and Fast Forward Award Styria (2015). According to Clarivate Analytics, she belongs to the most influential researchers world-wide (top 1, for the category Cross Fields in 2018).

Natalie Breakfield



Natalie Breakfield, NewLeaf Symbiotics
nbreakfield@newleafsym.com

Title: Utilizing M-trophs in sustainable agriculture

Biography:

Natalie Breakfield is Molecular Biology Director at New Leaf Symbiotics in Saint Louis, Missouri, USA. In this role, she oversees the isolation, sequencing, and initial phenotyping of *Methylobacterium* and *Methylorubrum* spp. (M-troph) isolates. She works with other teams to advance the most promising candidates through NewLeaf's product pipeline. NewLeaf is focused on discovering how M-trophs benefit plants across a large variety of field conditions, and currently has two bio-complement products on the market: Terrasym401 for soy and Terrasym402 for peanut.

Dr. Breakfield obtained her Ph.D. from Duke University and was a postdoctoral fellow at University of North Carolina - Chapel Hill. She is a member of the board of directors of the International Alliance for Phytobiomes Research (Phytobiomes Alliance).

Sharon Doty



Doty received a B.S. degree in Genetics from the University of California, Davis. Her Ph.D. research in the Microbiology Dept. at the University of Washington (UW) was on *Agrobacterium* plant signal perception and responses, and her postdoctoral research was in plant biochemistry, developing plants with improved capacity to remove environmental pollutants. She is currently a Professor in the UW School of Environmental and Forest Sciences (SEFS) and an Adjunct Professor with the UW Microbiology Department. Her research focus is on the importance of the plant microbiome for plant growth, nutrient acquisition, and tolerance to both abiotic (drought, heat, pollutants, salt) and biotic (pathogens) stresses. Through her outreach and teaching, Doty emphasizes the ability of natural plant-microbe partnerships to address environmental challenges including agricultural chemical run-off, climate change, and pollution. Prof. Doty serves on the executive teams of the International Symbiosis Society and the International Poplar Commission, and is an associate editor for *Frontiers in Microbiology*.

Adi Doron-Faigenboim



Undergraduate studies on Biology and computer Science followed by masters and PhD degrees in Cell research and immunology. Joint the ARO, the Volcani Center in 2011 to establish a bioinformatics unit with the aim of assisting scientists advance their research with bioinformatics methodologies. The unit provides data analysis services, consultation and training to scientists. Main areas of expertise include the analysis of experiments which use genomic technologies (e.g. Next Generation Sequencing). Main activity is NGS analyses of RNA-seq for differential expression, whole genome (WGS) for variant calling (SNPs and Indels), and Metagenomics.

Samir Droby



Prof. Samir Droby is a senior research scientist at the Department of Postharvest Sciences, ARO, the Volcani Center and Professor of Plant Pathology and postharvest Sciences at the Division of Biochemistry and Food Science at the Robert H. Smith Faculty of Agriculture Food and Environment, The Hebrew University of Jerusalem. His research expertise include developing biological and natural based control strategies for postharvest diseases, microbiome of harvested fruit and its use to study microbial networks fruit surfaces, mode of action of yeast biocontrol agents, Pathogenicity mechanisms of *Penicillium* species on citrus and apple fruit and resistance mechanisms of fruits against postharvest pathogens. Prof. Droby published more than 150 articles in peer-reviewed journal, 25 review articles and 25 book chapters on various topics on postharvest pathology.



Shiri Freilich

Graduate and masters studies in Tel Aviv University in life and plant sciences. Completed her PhD studies in Bioinformatics in Cambridge University, UK. Joint the Agricultural research Organization (ARO) in Newe Yaar research Center in 2012 to work on systems biology in ecology and agriculture. Her research aims at harnessing microbial function for the service of ecology & agriculture through the educated design of communities. To this end, she apply and develop computational models for predicting and understanding the networks of interactions formed within microbial communities by analyzing meta/genomics data. Using the tools we can delineate trophic dependencies, exchanges, competitive and cooperative interactions within natural microbial communities and use simulations for predicting potential routes for the optimization of predefined functions. The research in the group focuses on the activity of

microbial communities in agricultural soil and is targeted for harnessing genomic approaches towards promoting sustainable solutions in agriculture practice. Research projects include promoting enhanced degradation of herbicides in soil
Deciphering microbial functions in amendment-based solutions for soil-borne disease suppression
Delineating tri trophic networks between crop plants, sap-feeding pests and their microbial symbionts

Colin Jackson



Dr. Colin Jackson has been working in the area of microbial ecology and diversity for almost 25 years. His research examines the structure and function of the microbiomes of organisms, both plants and animals, and also that of natural environments. Plant microbiome work in his lab has primarily focused on the phyllosphere, examining spatial and temporal patterns in the bacterial phyllosphere community. Other areas of interest include the importance of the plant microbiome in plants of nutritional and medicinal importance. Dr. Jackson's current research is exploring how host genetic and phylogenetic diversity interact with the microbiome to form a functional holobiont.

Haïssam Jijakli



Professor in Plant Pathology, Haïssam Jijakli has been working for 28 years on the development of biocontrol methods based on micro-organisms and their derivatives to protect plants against pathogens and weeds. He participated or coordinated more than 40 projects with Belgian and foreign partners and produced more than 400 scientific publications (including 130 peer-reviewed articles). He also authored 7 patents and created 4 spin-off companies, one being involved in the development of a biopesticide based on a yeast against postharvest diseases of fruits. That yeast, *Candida oleophila* strain O is now registered in the EU and the US under the name of NEXY. Another recent spin-off is dedicated to the development of herbicides based on essential oils. Thanks to these results and fruitful collaborations, his laboratory internationally recognized for its research on biocontrol using fundamental and practical approaches.

Jenny Kao-Kniffin



Jenny Kao-Kniffin [pronunciation: GAOW-nif-IN] is an Associate Professor at Cornell University's School of Integrative Plant Science. She received her Ph.D. from the University of Wisconsin-Madison in Land Resources, with a specialization in Ecosystem Microbiology. She then served as a Postdoctoral Research Fellow with the National Science Foundation (NSF) investigating landscape-scale patterns of microbial composition near Barrow, Alaska. Dr. Kao-Kniffin is passionate about studying the biological component of soils, and its intricate relationship with plants. The research subjects range from crops and model plant species to invasive plants and weeds in agricultural and natural ecosystems, with a major focus on microbiome assembly, modification, and resilience impacting plant traits.

Barry Knight



Title - Endophytes in Production Agriculture

As Head of Indigo Research Partners, Barry oversees the world's largest agriculture laboratory. Prior to joining Indigo, Barry held senior positions in agricultural companies as CEO of Cresco Ag, CCO of Pinnacle Ag Holdings, and President of Jimmy Sanders. At Sanders, company sales grew by three-fold over four years while increasing its EBITDA by

4X. This successful growth led to the shareholders' desire to sell the company to Apollo Global Management. Before Sanders, Barry led Monsanto's sales in the coastal region of the US with over \$1 billion in sales of seed, chemistry and biotech traits. Barry entered the agriculture industry through the USDA before spending time working for American Cyanamid. Barry received a B.S. degree in Agronomy from Oklahoma State University and a M.S. degree in Agronomy specializing in plant breeding from Mississippi State University. Barry was selected as Alumni Fellow at Mississippi State in 2011 and serves on the Scientific Advisory Board for the Vice President of Research and Development and on the School of Agriculture's Advisory Committee.

Steven Lindow



Assembly of epiphytic bacterial communities on plants and their interactions with the plant host

The Lindow lab focuses on the ecology and management of plant-associated bacteria with a focus on both epiphytic and endophytic bacteria. A thrust of the lab has been on identification of traits that confer fitness and stress tolerance of bacteria on leaf surfaces and their regulation. The contribution of intra- and inter-

species

chemical communication that mediates expression of cell density-dependent traits in both *Pseudomonas syringae* and *Xylella fastidiosa* are being addressed with the aim of modifying their behaviors to achieve plant disease control. The benefit to bacteria of their production of factors such as plant hormones such as 3-indole acetic acid, biosurfactants, and other extracellular products to the colonization of plants and of the effect of these compounds on plant is also being investigated. The emigration of bacteria from, and immigration of bacteria to plants, via airborne transport is being studied to better understand processes determining the context-dependent assembly of epiphytic communities on plant surfaces.

Tal Luzzatto-Knaan



Title of Presentation:

Harnessing metabolomics in microbiome studies

Tal Luzzatto-Knaan

Completed her undergraduate studies in Biotechnology and Environmental Sciences at Tel-Hai Academic College. Earned her Masters in Biotechnology and Ph.D in Biochemistry, Food Science and

Nutrition at the Hebrew University of Jerusalem and Volcani center (ARO), studying the role of secondary metabolites in plant-pathogen interactions. As a BARD post-doctoral fellow at UCSD she gained her expertise in mass spectrometry-based metabolomics, by developing tools for studying microbial chemistry and natural products discovery. Joint the department of Marine Biology at the University of Haifa, where she uses metabolomic approaches to explore the spatial and temporal patterns of natural products in marine photosynthetic microorganisms.

Dumitru Macarisin



Dr. Dumitru Macarisin is a Research Microbiologist in the Division of Microbiology, in the Center for Food Safety and Applied Nutrition, Food and Drug Administration (FDA), at College Park in Maryland, U.S. Dr. Macarisin is FDA subject matter expert for *Listeria monocytogenes* in and he also leads the Agency's development and implementation of research projects related to microbial safety of fresh fruits and vegetables. Dr. Macarisin earned his Ph.D. in Plant Physiology and

Biochemistry in 2003 and pursued further postdoctoral research in the Agricultural Research Organization -Volcani Center, Israel followed by an 8-year research tenure with the Agricultural Research Service-United States Department of Agriculture. He conducted extensive research in postharvest pathology and biocontrol, plant stress response, produce safety, and microbiology. Dr. Macarisin came to the FDA in 2013 and his primary research interests are to identify the mechanisms of fresh fruit contamination and environmental reservoirs of foodborne pathogens and develop mitigation strategies to improve good agricultural practices in the prevention of produce recalls and foodborne outbreaks. Dr. Macarisin represents the FDA nationally and internationally on critical food safety issues. He has been furnishing recommendations on preventive controls, environmental monitoring and the improvements of quality controls to other governmental agencies and food industries.

Mark Mazzola



Mark Mazzola is a Research Plant Pathologist with the USDA Agricultural Research Service Tree Fruit Research laboratory in

Wenatchee, Washington. He serves as a faculty member in the Department of Plant Pathology at Washington State University, as well as Professor in the Department of Plant Pathology at Stellenbosch University, South Africa. Dr. Mazzola leads a team which seeks to effectively engineer structure and function of the indigenous soil, rhizosphere and endophytic microbiome through utilization of differentially selective host genotypes and biologically active organic residue soil inputs. The overall goal of this program is the formulation of effective and ecologically sound systems for soil-borne disease suppression in orchard ecosystems.

Andrea Ottenson



FDA

Microbiome Research in the Office of Regulatory Science,
CFSAN

Dr. Ottesen uses metagenomic approaches to better understand phytobiomes and important food microbiomes. Her research focus has been on the description of microbiota along the farm to fork continuum to identify environments and conditions that may correlate with an increased risk of introducing pathogens to the food supply. Her research also contributes data to support the evolution of good agricultural practices (GAPs) and improved Food Safety Modernization Act (FSMA) regulatory policy. She is currently coordinating the implementation of MetaGenomeTrakr as part of the GenomeTrakr program. MetaGenomeTrakr is focused at pathogen source tracking but also on the description of the microbiota of all-American food for a wider range of food quality and nutrition metrics that may be microbiome dependent.



Adam R. Rivers, PhD
Computational Biologist
USDA-ARS Genomics and Bioinformatics Research Unit

Microbiome data are compositional. DNA sequencing is a process that samples an arbitrary number of reads from a much larger pool of DNA. This means that each taxon/gene detected has an effect on every other taxon/gene and the total number of reads only affects the accuracy of our estimates. This has profound implications that require a shift in the way we think about our data. The total number of reads assigned to a taxon or gene does not directly correspond to the number of copies in the sample. Dividing by the total does not solve this. The compositional nature means that many commonly used microbiome methods are inappropriate, including common methods of sub-setting data for bar plots, distance methods like Bray-Curtis, standard ordination and many covariance networks. Fortunately, the field of Compositional Data Analysis (CoDa) has developed a number of methods applicable to microbiome data and new microbiome specific analysis packages using these methods are available to analyze the data correctly. Doing this requires us to change our methods, and in some cases the way we formulate our research questions. This talk explains the problem, how compositional data use log ratios to solve it and how to replace conventional methods with statistically appropriate compositional methods.



Justin Shaffer

Presentation title: Plant microbial ecology: developing a framework for meta-analyses and other comparative studies.

Bio: I am a broadly trained plant and microbial ecologist with expertise in lichenology, mycology, and community ecology. My research interests are centered on plant-microbe interactions, particularly those involving fungi, and seek to elucidate the roles of such microbes in driving community-wide patterns, such as those influencing host fitness, and/or impacting ecosystem services.

Currently, I am exploring deep parallels in environmental and host-associated microbial community ecology using large scale, multi-omics and meta-analytical approaches, in part by working with the American Gut Project, Global FoodOmics, and the Earth Microbiome Project.

Leonardo Schena



Leonardo Schena, is associated professor of Plant Pathology at the Department of Agriculture of the Mediterranean University of Reggio Calabria, Italy, since 2007. From November 2000 to February 2007 he was a free researcher at the Department of Plant Protection and Applied Microbiology (DPPAM) of the University of Bari, Italy, with an interruption of 18 months (March 2004-September 2005) during which he was Research Scientist at the Scottish Crop Research Institute, United Kingdom, having been awarded a Marie Curie Intra-European Fellowship. Previously he was a PhD student at the DPPAM (January 1998-October 2000) and research fellow (January-December 1997) at the Department of Postharvest Science, The Volcani Center, Israel. He

has published more than 90 peer-reviewed journal articles and several books chapters. Current research mainly focuses on the microbiota of important crops such as olive, citrus, strawberries, grape, wheat, and apples, to understand structure and function of the microbiome. He also used amplicon metagenomics approaches to investigate the aetiology of plant diseases and evaluate the impact of environmental conditions, management practices, and host genotype on the plant microbiome. He documented how external factors such as olive fruit fly infestations may cause imbalanced fungal communities in the olive carposphere. Other research lines include the evaluation and use of alternative control methods against diseases of fruit and vegetables and the development of quantitative molecular detection methods for bio-control agents and fungal and bacteria plant pathogens. The European and Mediterranean Plant Protection Organization (EPPO) currently use some of the developed methods in official diagnostic protocols. A special focus of his career has been given to study Oomycetes species. He contributed to resolve inter- and intraspecific phylogenetic correlations among *Phytophthora* species and discovered and characterized new *Phytophthora* hybrids and species as well as a related genus named *Nothophytophthora*. He also was a pioneer in the development and application of an amplicon metagenomics approach based on genus specific primers to detect *Phytophthora* species.

Edward Sionov



Edward Sionov is a research scientist at the Agricultural Research Organization (The Volcani Center), Israel. His research combines molecular biology and analytical chemistry approaches to study mechanisms and environmental conditions associated with development of mycotoxigenic fungi and the production of mycotoxins in agricultural commodities, raw and processed food and feed. His lab has great expertise in molecular biology studies, analyses of the fungal secondary metabolites and mycotoxins regulation.

Davide Spadaro



Davide Spadaro is Associate Professor of Plant Pathology at the University of Torino and Researcher at AGROINNOVA. He was Visiting Professor at the Thammasat University of Bangkok (Thailand), Visiting Scientist at the University of Edinburgh (UK), Research fellow at the University of Lleida – IRTA (Spain) and at the University of Bonn (Germany). He is member of the Teaching Committee of the Ph.D. School in Biological Sciences and Applied Biotechnologies of the University of Torino. He is Secretary of the Subject Matter Committee Postharvest of the International Society of Plant Pathology. He is member of the Council of the Italian Society of Plant Pathology. Member of the

Academy of Agriculture of Torino. He is author of 11 book chapters and 4 patents. His 106 papers on international Journals have been cited over 2,200 times, his Hindex is 25 (Scopus). He worked on several European and national projects. His research topics spans from the mechanisms of postharvest biocontrol to the use of essential oils and thermotherapy in postharvest, from the prevention and control of mycotoxins to the development of diagnostic tools for plant pathogens.

Silvana Vero



Dr. Silvana Vero is Associate Professor in the Department of BioSciences at Universidad de la República, Montevideo, Uruguay. She is a Chemist and completed a Ph.D. in Chemistry at the same University. She got a post-doctoral position in Food Microbiology at Universidad de Córdoba, Spain. Her research focuses on the biology and biotechnological applications of fungi. In particular, some of her projects have focused on biological control of postharvest diseases using cold adapted yeast and also on the control of mycotoxigenic molds in grains. She is now working with food fermented products like kefir, studying the microbial consortia and looking for applications of those microorganisms in preserving food and feed products. She has also worked in the analysis of microbiome in sea waters from Antarctica.

Susan Whitehead



Dr. Susan Whitehead is an Assistant Professor in the Department of Biological Sciences at Virginia Tech. Previously, she completed a B.A. in Biology at Oberlin College, a Ph.D. in Ecology and Evolutionary Biology at the University of Colorado at Boulder, and post-doctoral studies in Applied Chemical Ecology at Cornell University. Her research focuses on the evolutionary ecology of interactions between plants and other organisms. In particular, most of her projects have focused on plant secondary chemistry and its fundamental role in shaping complex interaction webs among plants, herbivores, pathogens, microbial partners, pollinators, and seed dispersers. Dr.

Whitehead's research is grounded in field-based studies that span tropical and temperate forests as well as agricultural systems. She is currently spearheading a large USDA-funded project focused on the apple microbiome. The project examines how different pre-harvest pest management practices impact the apple microbiome, and how the microbiome, in turn, impacts fruit chemistry, pest resistance, and fruit quality for specialty uses such as hard cider.

Susan R. Whitehead

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Michael Wisniewski



Dr. Michael Wisniewski is a Lead Scientist in the USDA-ARS and is located at the Appalachian Fruit Research Station, Kearneysville, WV. He has conducted research in postharvest pathology, postharvest biological control, and cold hardiness of fruit crops for over 30 years. He has published well over 200 peer-reviewed publications and more than 30 book chapters. He holds several patents and was elected a Fellow of the American Society of Horticultural Science and an Honorary Life Time Member of the Canadian Society of Plant Pathology. As a recipient of numerous U.S. – Israel Binational Agricultural and Research Development (BARD) grants, he has

collaborated with Dr. Samir Drobny for many years on topics related to postharvest pathology and biological control. Together, they have sponsored several international workshops on topics related to postharvest and founded the ISHS working group on Postharvest Pathology. His research was the first to document the ability of yeast to parasitize higher fungi and he and his colleagues developed the first genetic marker for postharvest disease resistance to *P. expansum* in the progenitor apple species, *Malus sieversii*.