PHYTOBIOMES: COMPLEX SYSTEMS OF PLANT-BASED AGRICULTURE

Phytobiomes consist of all organisms living in, on, or around plants (e.g., microbes, animals, other plants), and the environment (i.e., soil, air, water, and climate).

FUNDING COORDINATED PROJECTS

- Novel microbiome technologies to increase profitability for Australian horticulture
  Funded by Hort Innovation, Australia – Coordinator: Kirsty Bayliss, Murdoch University

- USCCN – United States Culture Collection Network
  Funded by the National Science Foundation (NSF), USA – Coordinator: Dusti Gallagher, Phytobiomes Alliance

- Genome-Based Circumscription and Phenotyping of Regulated Microbes, Especially the Select Agent Ralstonia solanacearum – LINS
  Funded by the USDA Animal Plant Health Inspection Service (APHIS), USA – Coordinator: Angela Sessitsch, AIT, Austria

- MicrobiomeSupport: Harmonising Microbiome Research Methods & Funding Worldwide
  Funded by the EU Horizon 2020 research and innovation programme – Coordinator: Angela Sessitsch, AIT, Austria

- Succession of Microbial Assemblages During Seed Development – SEEDS
  Funded by the Agence National de la Recherche (ANR), France – Coordinator: Matthieu Barret, INRAE, France

- Inheritance of Abiotic Stress Tolerance Through Seed Microbiome Modification
  Funded by the National Institute of Food and Agriculture (NIFA), USA – Coordinator: Ashley Shade & Chad Niederhuth, Michigan State University, USA

- USCCN – United States Culture Collection Network
  Funded by the National Science Foundation (NSF), USA – Coordinator: Dusti Gallagher, Phytobiomes Alliance

- MASTER – Microbiome Applications for Sustainable food systems through Technologies and EnteRprise
  Funded by the EU Horizon 2020 research and innovation programme – Coordinator: Paul Cotter, Teagasc, Ireland

- Metagenom Bio Life Science – Culture Independent Testing and Monitoring for Controlled Environment
  Funded by the Ontario Ministry of Agriculture, Food and Rural Affairs, Ontario Agri-Food Research Initiative

- The UK Crop Microbiome Cryobank
  Funded by the Biotechnology and Biotechnology Sciences Research Council (BBSRC) – UK Research Innovation – Coordinator: Matthew Ryan, CABI

- SUCSEED – Stop the use of pesticides on seeds
  Funded by the Agence National de la Recherche (ANR), France – Coordinator: Matthieu Barret, INRAE, France

VISION

- Enhance understanding of the interactions between plants, microbiomes, and other components of phytobiome systems
- Link site-specific and temporal geophysical and biological data
- Develop databases that support correlation studies between biological and geophysical phytobiome components
- Draft standards, protocols, check-lists (minimum information, sampling, reference datasets, regulatory requirements...)
- Deploy genome sequence-based classification system for microbes
- Design preliminary models for several agroecosystems (crops, forage, trees...)

STRATEGIES

- Identify research, resource and technology gaps and develop roadmaps to fill them
- Coordinate and manage projects to address gaps
- Facilitate international and public-private collaborations
- Focus on pre-competitive science
- Develop an interdisciplinary community of researchers committed to advancing phytobiomes science
- Empower industry growth and profitability

SHORT TERM PRIORITIES

- Enhance understanding of the interactions between plants, microbiomes, and other components of phytobiome systems
- Link site-specific and temporal geophysical and biological data
- Develop databases that support correlation studies between biological and geophysical phytobiome components
- Draft standards, protocols, check-lists (minimum information, sampling, reference datasets, regulatory requirements...)
- Deploy genome sequence-based classification system for microbes
- Design preliminary models for several agroecosystems (crops, forage, trees...)
- Draft regulatory science roadmap for microbials

ALLIANCE LINS PROJECT: Whole Genome Sequence-Based Classification & Identification Platform

Model: Ralstonia solanacearum
Database of sequences coupled to pathogenicity data
Precisely circumscribe the strains that should be designated as “Select Agents”

Objective: Enable rapid and precise taxonomic identification of microbes

Expand model to other agriculturally relevant bacteria
Expand to include plant-associated fungi

For more information about becoming a sponsor or ways to be involved contact Kellye Eversole, eversole@eversoleassociates.com or Lori Leach, leach@eversoleassociates.com