Global Engage

11TH PLANT GENOMICS & GENE EDITING CONGRESS: USA

8TH PARTNERSHIPS IN BIOCONTROL, BIOSTIMULANTS & MICROBIOME CONGRESS: USA

RALEIGH, NORTH CAROLINA, USA

October 21-22 2024

#PlantGenomicsGE

www.global-engage.com

Global Engage

Global Engage is pleased to announce the **11th Plant Genomics and Gene Editing Congress**, co-located with the **8th Partnership in Biocontrol, Biostimulants & Microbiome Congress** which is confirmed to be held on 21-22 October 2024 in Raleigh, USA.

Plant Genomics and Gene Editing

This year's Congress will focus on innovative strategies and advancements in plant genomics and gene editing. Academic and industry experts will share genome editing case studies in key crops including wheat, maize, rice and soybean, highlighting the latest applications for enhancing traits such as disease resistance and stress tolerance. Utilising computational approaches through plant phenotyping is a rapidly developing area of the field as well as the integration of bioinformatics, and the potential of artificial intelligence in this field. Moreover, an expert panel discussion will explore the most recent updates in genome editing policy and regulation.

Biocontrol, Biostimulants & Microbiome

The co-located 8th Partnerships in Biocontrol, Biostimulants, and Microbiome Congress will examine case studies, focusing on new research into identifying and developing agricultural biopesticides and biostimulants on day 1. Novel platforms for developing biological products will be discussed as well as updates in biocontrol and biostimulant policies and regulation during an interactive panel discussion. Day 2 of this congress will focus on the plant microbiome where the symbiotic relationships between microbes and plants will be reviewed through case studies in plant and soil microbiomes as well as bacterial-fungal interactions. Academic and industry leaders will present new findings on the rhizosphere, phyllosphere, and endosphere and the application of plant and soil microbiome research in improving stress resistance, nutrient acquisition, crop yield, and tolerance to abiotic and biotic stress.

	11th Plant Genomics & Gene Editing Congress	8th Partnership in Biocontrol, Biostimulants & Microbiome Congress
Day 1	Plant genomics & gene editing	Plant biostimulants & biocontrol
Day 2	Plant bioinformatics, computational tools, & data analysis	Plant microbiome

PLANT GENOMICS & GENE EDITING

- Genome editing case studies in wheat, rice, maize, barley and soybean
- Development and application of gene editing technologies, including CRISPR/Cas9
- Plant phenotyping
- Using genome editing to improve disease resistance and stress tolerance
- Crop trait development
- Current plant gene editing regulatory guidance

PLANT BIOINFORMATICS, COMPUTATIONAL TOOLS, & DATA ANALYSIS

- Application, analysis, and challenges of bioinformatics
- Computational tools for data modelling and visualisation
- Machine Learning and AI
- Fine Phenotyping

PLANT BIOSTIMULANTS & BIOCONTROL

- Fulvic and humic acids
- Plant and fungal extracts
- Developing sustainable biostimulants and biopesticides
- Regulatory updates and business considerations

PLANT MICROBIOME

- Host-pathogen interactions
- Rhizosphere, phyllosphere and endosphere biology
- Identifying microbes to enhance crop productivity & disease resistance
- Microbiome research technologies
- Plant and soil microbiome case studies

PANEL DISCUSSION TOPICS

- Plant genomics and gene editing regulatory and policy updates
- Biostimulants and biocontrol regulatory and policy updates

PROPOSED ROUNDTABLE TOPICS

- Refining gene editing methods and applications
- Plant genomics challenges beyond technology
- The future of agriculture: Challenges and how to overcome these.
- Biostimulants and biocontrol regulatory and policy updates

"The technologies involved are shockingly powerful and robust, so the only serious constraint to our productivity is a shortage of creativity"

I am excited to speak at the upcoming Plant Genomics & Gene Editing Congress, held concurrent and colocal with the Partnerships in Biocontrol, Biostimulants and Microbiome Congress. Meetings such as these provide unique opportunities to share the latest advances in our understanding of plant genetics and the development of innovative agricultural solutions.

As a scientist deeply involved in studying genome components, especially their interactions, I am continually inspired by the power of modern genomic technologies. The technologies involved are shockingly powerful and robust, so the only serious constraint to our productivity is a shortage of creativity. My lab focuses on plant genome structure and evolution, and the intricate relationships between genome components and interactive gene function.

Our research encompasses a wide range of specific projects, including genetic diversity in under-utilized crops, the rapid evolution of complex disease resistance loci in plants, genome rearrangement, biomass improvement for bioenergy, and the coevolution of plant/microbe interactions. All topics we can explore together at these meetings.

During my presentation, I will share discoveries from a novel strategy we call Microbial Partner (MiPner) analysis, which uses cultured microbes as bait to identify and sequence microbial binding partners from natural environments. Our pilot experiments on soil bacteria indicate that each bait microbe selects a unique subset of soil microbes, some of which require co-growth with the bait microbe for proliferation on plates.

These meetings provide invaluable opportunities to share knowledge, foster collaborations, and explore new technologies that will drive the future of agriculture. I encourage everyone attending the meetings to ask challenging questions and be a part of all discussions.

Sincerely,

Jeff Bennetzen
Giles Professor, Department of Genetics, University of Georgia

Gold Sponsor

YOKOGAWA
Co-innovating tomorrow™

Silver Sponsors

GENEWIZ® From Azenta Life Sciences

kaneka
The Dreamology Company
—Make your dreams come true—

Exhibitor & Content Sponsors

mirxes
TO KNOW. TO ACT.

Novogene
Advancing Genomics, Improving Life

pairwise®

HUDSON RIVER
Bio technology

Eremid®
GENOMIC SERVICES

Media Partner

CONFERENCE locate.com

SPONSORSHIP & EXHIBITION OPPORTUNITIES AVAILABLE

For more details contact Gavin Hambrook: gavin@globalengage.co.uk

CONFIRMED SPEAKERS

WOLFGANG BUSCH
Professor and Executive Director, Harnessing Plants Initiative, Salk Institute for Biological Sciences

ALEXANDER BUCKSCH
Associate Professor, School of Plant Sciences, University of Arizona

ANDREW BENT
Professor, Department of Plant Pathology, University of Wisconsin-Madison

CHRISTINE SHYU
Regulatory Science Genome Editing Enablement Lead, Bayer Crop Science

DEEPIKA CHAUHAN
Associate Director, Transformation, Pairwise

HENRY SQUIRE
PhD Candidate in Chemical & Biomolecular Engineering, University of California, Berkeley

IAN JEPSON
Global Technology Lead, Seeds Research & RTP Site Business Head, Syngenta

KEITH MATTHEWS
Principal, Matthews Law LLC

JAMIE SAXON
Head of Sustainability, Inari Agriculture

KIRAN MYSORE
Distinguished Professor, Oklahoma State University

LISA ZANNONI
Senior Regulatory Advisor, Norfolk Healthy Produce

MARC LIBAULT
Professor, Division of Plant Science and Technology, Interdisciplinary Plant Group, University of Missouri-Columbia

MARY GRANTHAM
Technical Applications Scientist, Azenta Life Sciences

NOEL SAUER
Senior Vice President of Research, Cibus

PETER SELBY
BrAPI Project Coordinator, Cornell University

RAO UPPALAPATI
Program Leader Disease Resistance Traits, Corteva Agrisciences

SUBRAY HEGDE
Director, Biotechnology Risk Analysis Programs, APHIS USDA

TRUPTI JOSHI
Associate Professor, University of Missouri-Colombia

WUSHENG LIU
Associate Professor, Department of Horticultural Science, North Carolina State University

AKIRA ENDO
Senior Manager, Agri-Bio section, New Business Development Unit, Kaneka Americas Holding, Inc.

ADRIAN PERCY
Executive Director, N.C. Plant Sciences Initiative

SENIOR REPRESENTATIVE
Yokogawa Electric Corporation

SENIOR REPRESENTATIVE
Hudson River Biotechnology

CONFIRMED BIOCONTROL & MICROBIOME SPEAKERS

JEFF BENNETZEN
Giles Professor, Department of Genetics, University of Georgia

AMANDA PIERCE
Senior Advisor, Emerging Technologies Branch, Biopesticides Division, Environmental Protection Agency (EPA)

CHRIS WOOLEY
Portfolio Manager- Specialty Actives, Wilbur-Ellis Agribusiness

HARSH BAIS
Professor of Plant and Soil Interface, University of Delaware

JANE FIFE
Chief Technical Officer, 3BarBiologics

JIARUI LI
Chief Executive Officer, Innatrix Inc

MICHAEL DILEGGE
Director of Microbiology, Impello Biosciences

MORGAN CARTER
Assistant Professor, Department of Biological Sciences and CIPHER, University of North Carolina at Charlotte

PATRICK DOYLE
Vice President of Product Development and Regulatory, Plant Health Care Inc

WIEBKE STRIEGEL
Senior Scientist, Environmental Protection Agency (EPA)

XINNIAN DONG
HHMI investigator/Arts & Sciences Professor of Biology, Duke University

YURI MIZUNO
Chief Scientist, Manda Fermentation Co. Ltd

NC STATE UNIVERSITY

October 22nd 2024
7:30-9:00am, Shuttle Departs at 7:30am From The State View Hotel

The N.C. Plant Sciences Initiative (N.C. PSI) directly addresses the grand challenges of agriculture and provides solutions for a growing world. The N.C. PSI supports wide-ranging, innovative research in the plant sciences by creating an entrepreneurial and collaborative environment and culture that thrives through the convergence of cross university, interdisciplinary, team-based science. It's a catalyst to bring collaborators together from across NC State University to create solutions for complex agricultural issues in North Carolina and beyond.

The NC State Plant Sciences Building (PSB) is a unique investment in collaboration. By creating innovative workspaces including embedded working environments for government, students, research faculty and industry partners, we have developed diverse spaces for diverse expertise that can quickly scale solutions from the lab to the field. This ensures rapid delivery of new technology and techniques to farmers and agribusinesses

Tour spots are available on a first come first served basis for registered delegates only.

For more details, visit Plant Genomics 2024 and N.C. Plant Sciences Initiative.

8:00-8:50 Registration & Morning Refreshments

8:50-9:00 Global Engage Welcome Address

9:00-9:35

KEYNOTE PRESENTATION:
WOLFGANG BUSCH
Professor and Executive Director, Harnessing Plants Initiative, Salk Institute for Biological Sciences
Engineering Root Traits for Climate Change Mitigation
Climate change will soon profoundly affect human civilization. Technical solutions to address the high levels of CO2 in the atmosphere at scale are absent. However, plants are central agents in the earth's carbon cycle and plant derived carbon depositions have built up three times more carbon in the soil than is contained in the atmosphere. Specific root traits are important contributors to the accumulation and permanence of carbon in the soil. These include root depth, root biomass and the levels of refractory carbon compounds in root tissues. I will present our efforts to identify genetic and molecular mechanisms that regulate these traits and to leverage genetic engineering and gene editing for enabling agriculture to contribute to massive CO2 removal and climate change mitigation.

11TH PLANT GENOMICS & GENE EDITING CONGRESS

PLANT GENOMICS & GENE EDITING

9:35-10:00

KEYNOTE PRESENTATION:
CHRISTINE SHYU
Regulatory Science Genome Editing Enablement, Lead, Bayer Crop Science
Towards a Future-Proof Global Regulatory Environment for Genome Edited Products
- Genome editing as a tool to create variation
- Current global regulatory environment and the importance of future-proof policies to enable edited product development
- A proposed fit-for-purpose approach for risk assessment of edited products

10:00-10:30

SENIOR REPRESENTATIVE
Yokogawa Electric Corporation

8TH PARTNERSHIPS IN BIOCONTROL & BIOSTIMULANTS & MICROBIOME CONGRESS

PLANT BIOCONTROL & BIOSTIMULANTS

9:35-10:00

KEYNOTE PRESENTATION:
PATRICK DOYLE
Vice President of Product Development and Regulatory, Plant Health Care Inc
Gazing into the crystal ball: 10 trends that will shape Biostimulant / Biocontrol markets
The future of biostimulants and biocontrol products lies in their continued development, understanding their mechanisms, and their integration into modern agricultural practices. These eco-friendly solutions are essential for addressing global challenges and ensuring food security.
- Aligned definitions within the marketplace will drive greater adoption.
- Optimized cost of goods, clarity of mode of action, & fit with current agronomic practices will become critcally important as products move from high value markets to row crops.
- Regulatory pressures & bottlenecks will (eventually) ease when agencies move from Policy based review to Science based review.

10:30-11:20 Morning Refreshments / Poster Presentations / One-to-One Meetings

PLANT GENOMICS AND GENE EDITING

11:20-11:45

ANDREW BENT
Professor, Department of Plant Pathology, University of Wisconsin-Madison
CRISPR and Cisgenic Strategies for Soybean Improvement Using Efficient WCIC Meristem-Based Transformation
The UW-Madison Wisconsin Crop Innovation Center has developed an efficient, genotype-flexible meristem-based transformation system for soybean that generates a high percentage of quality events using bulk-isolated/storable meristem-containing explants. CRISPR gene edits were not initially forthcoming with this transformation system. We have now obtained sgRNA-directed mutations at high frequency using this system. Cisgenic strategies for improvement of soybean cyst nematode resistance are also being tested and initial successes will be reported.

PLANT BIOCONTROL & BIOSTIMULANTS

11:20-11:45

AMANDA PIERCE
Senior Advisor, Emerging Technologies Branch, Biopesticides Division, Environmental Protection Agency (EPA)
EPA's regulatory framework and policy considerations for biocontrol
- Explaining the regulatory landscape for biocontrol products in the United States
- Outlining the status of policy and regulatory initiatives for creating regulatory efficiencies in the path to commercialization
- Exploring EPA's future goals and vision for the regulation of biocontrol

11:45-12:10

KIRAN MYSORE
Distinguished Professor, Oklahoma State University
Improving Plant Transformation and Gene Editing Using an Engineered Agrobacterium Strain
Agrobacterium-mediated plant transformation (AMT) is the basis of modern-day plant biotechnology. One major drawback of this technology is the recalcitrance of many plant species/varieties to Agrobacterium infection. Two main reasons for recalcitrance to AMT are a strong plant defense response against Agrobacterium and the inability of the plant tissue to regenerate. We developed a strategy to increase AMT by engineering Agrobacterium to express a type III secretion system (T3SS) and deliver the P. syringae effectors to suppress host defense responses. Efforts are under way to deliver plant morphogenic regulators through the engineered Agrobacterium with T3SS to enhance plant regeneration. Efforts are also under way to deliver CRISPR-Cas9 reagents through the T3SS of engineered Agrobacterium to overcome some of the current drawbacks of plant genome engineering.

12:10-12:25

MARY GRANTHAM
Technical Applications Scientist, Azenta Life Sciences
Advancing plant genomics through next generation sequencing
Maximizing the amount of information gained from a single sample is key in understanding plant systems and plays an important role in crop genetics. Advancements in next generation sequencing technologies has increased accessibility of sequencing to researchers, with multiomics playing a larger role in plant breeding. However, within and among multiomics approaches, each methodology and application has distinct advantages and disadvantages. These can include, but are not limited to, genomics, epigenomics, and transcriptomics. Choosing the best analysis approach is dependent on overall project goals, sample types, sample quantity, resources, and time. This presentation will review multiple-omics approaches, with considerations for experimental design as standalone and integrated approaches.

12:25-12:40

DEEPIKA CHAUHAN
Associate Director, Transformation, Pairwise
Enabling novel trait phenotypes through robust gene editing platform in Rubus
Pairwise is pioneering the application of CRISPR technology in food and agriculture with a focus on food nutrition and quality, environmental adaptability, and sustainability. We are developing commercially viable products using novel technologies and our proprietary gene editing tools, like SHARC™ and REDRAW™. To drive innovation from proof of concept to product, we have developed robust rapid assays platforms for testing of gene editing tools and scalable transformation pipelines to enable large scale gene edited plant production in blackberry genotype of commercial interest. In this presentation, insights on product development pipelines, our innovative gene editing platform- the FulcrumTM Platform and recent advances in blackberry trait phenotypes will be shared.

11:45-12:10

JIARUI LI
Chief Executive Officer, Innatrix Inc
Biopesticide Platform for Sustainable Crop Protection
The Innatrix team has built a proprietary and unique platform to rapidly develop eco-friendly biological products to control critical crop pathogens and pests. This platform strategy identifies molecular targets in pests and pathogens that are essential for the ability of the pest or pathogen to harm crops, and then rationally designs ways of interfering with the function of those molecular targets to protect crops. The target molecules may be genes that may be silenced using double-stranded RNA (dsRNA) or may be proteins that may be rendered inactive with the use of rationally designed peptides that bind to them.

12:10-12:25

12:40-1:40 Lunch / Poster Presentations / One-to-One Meetings

PLANT GENOMICS AND GENE EDITING

1:40-2:30

50-MINUTE PANEL DISCUSSION:
Plant genomics and gene editing regulatory and policy updates

KEITH MATTHEWS (Moderator)
Principal, Matthews Law LLC

AMANDA PIERCE
Senior Advisor, Emerging Technologies Branch, Biopesticides Division, Environmental Protection Agency (EPA)

LISA ZANNONI
Senior Regulatory Advisor, Norfolk Healthy Produce

CHRISTINE SHYU
Regulatory Science Genome Editing Enablement Lead, Bayer Crop Science

SUBRAY HEGDE
Director, Biotechnology Risk Analysis Programs, APHIS USDA

2:30-2:55

MARC LIBAULT
Professor, Division of Plant Science and Technology, Interdisciplinary Plant Group, University of Missouri-Columbia

Towards a system-level understanding of soybean-rhizobia symbiosis at the single cell level

Each plant cell is characterized by its specific function, developmental stage, and interaction with its environment. In this presentation, focusing on the symbiotic interaction between soybean plants and Bradyrhizobium diazoefficiens, nitrogen-fixing symbiotic bacteria we will present the use of single-cell omics and high-resolution spatial transcriptomics to 1) characterize the cellular complexity of the infection zone of the soybean nodule and reveal a similar cellular composition but different organization between different type of nodules, and 2) depict the role of the sub-cellular compartmentalization of plant transcripts as a regulatory mechanism of protein translation.

2:55-3:10

SENIOR REPRESENTATIVE
Hudson River Biotechnology

3:10-3:25

15-Minute Solution Provider Presentation
For sponsorship opportunities contact Gavin Hambrook
gavin@globalengage.co.uk

PLANT BIOCONTROL & BIOSTIMULANTS

1:40-2:30

POSTER FLASH PRESENTATIONS SESSION 1:
Poster presenters and start-ups will be provided with the opportunity to give a flash 3-minute overview of their work.

2:30-2:55

CHRIS WOOLEY
Portfolio Manager- Specialty Actives, Wilbur-Ellis Agribusiness

PATRICK DOYLE
Vice President of Product Development and Regulatory, Plant Health Care Inc

Customer Input on Sustainable Biocontrol Product Needs

- What Sustainability Means to US?
- What is needed for biocontrol products to be distributed to growers?
- What is the definition of a successful launch of a biocontrol product?

2:55-3:25

YURI MIZUNO
Chief Scientist, Manda Fermentation Co. Ltd

Effects of Manda Fermented Botanical Product (MFBP) on plant and soil microbiome

In Japan, there is an increasing recognition of the potential of biostimulant materials to enhance the intrinsic potential of crops, whilst also providing a means of mitigating the effects of environmental stress. Manda Fermented Botanical Product (MFBP) is a fermented product made by fermenting and aging 41 plant species at ambient condition for more than 3 years. Although FBP is not expected to have a generalized fertilizing effect due to the limited levels of N-P-K compositions, improvements in crop yield have been reported in foreign fields, which have been attributed to a biostimulant effects and category. This presentation will update the latest research data on the unique effects and mode of actions of FBP on plants and soil microorganisms.

3:25-4:35 Afternoon Refreshments / Poster Presentations / One-to-One Meetings

PLANT GENOMICS AND GENE EDITING

4:35-5:00

IAN JEPSON
Global Technology Lead, Seeds Research & RTP Site Business Head, Syngenta
Genome editing in crop plants
Genome editing is a powerful set of tools to discovery and optimize genes in crop plants. The technology holds the potential to improve a range of traits including drought tolerance, disease resistance, enhanced quality, improved breeding, and seed productions systems. In recent years the Cas12a toolbox has been optimized both in terms and efficiency and flexibility which has allowed researchers to gain a better understanding of the molecular mechanism of important traits. In this presentation improvements in Cas12a genome engineering tools will be shared in both dicot and monocots crops. Examples from our research group of recent technical breakthroughs in corn and soybeans covering a range of traits and breeding and seed productions technologies will be shared.

5:00-5:15

ADRIAN PERCY
Executive Director, N.C. Plant Sciences Initiative
N.C. Plant Sciences Initiative: Harnessing Interdisciplinary Science to Tackle Grand Challenges in Agriculture
The N.C. Plant Sciences Initiative at NC State University has the mission to solve grand challenges in agriculture through interdisciplinary, team based science, partnerships and talent development. We will reference a number of the ongoing research programs including in the fields of gene editing, plant microbe interactions and controlled environment agriculture. We will also announce the upcoming establishment of a Genome Editing center for Sustainable Agriculture.

5:15-5:30

AKIRA ENDO
Senior Manager, Agri-Bio section, New Business Development Unit, Kaneka Americas Holding, Inc.
Effective Generation of Gene Edited Crops using in planta Particle Bombardment Method
Crop breeding using gene editing technology becomes general means in nowadays. Most of gene edited crops are produced through the conventional transformation process and it takes long time to recover isogenic mutant lines for target genes. In addition, the degree of difficulty of transformation largely depends on variety of each crop. To overcome these disadvantages, our company have developed new technology that called in planta particle bombardment (iPB). iPB is the method delivering substances directly into the shoot apical meristem (SAM) of crops. Direct delivery of gene editing tools into SAM can generate heritable mutation in some crops without tissue culture process. In addition, iPB works with lower variety dependence. We will show you that iPB is powerful technology to generate gene edited crop.

5:30-5:55

RAO UPPALAPATI
Program Leader Disease Resistance Traits, Corteva Agrisciences
Enabling Corteva's Next Generation Technologies and CRISPR-Enabled Discrete Traits
- Corteva's CRISPR Technology and proprietary novel nucleases.
- Next generation Leaf Transformation technologies for genome editing.
- CRISPR-enabled disease super locus for managing multiple diseases.

5:55-6:20

NOEL SAUER
Senior Vice President of Research, Cibus
Rapid Trait Development System™ (RTDS®) advances plant breeding techniques through an end-to-end semi-automated gene editing platform.
- RTDS® is a suite of technologies that enables multiplexed gene editing within single cells. These edited cells are regenerated into shoots with new trait(s) such as higher yield, disease resistance or generation of sustainable ingredients.
- RTDS® has been developed in a multitude of commercially relevant crops such as canola, rice, wheat, potato, among others.
- Since all crops can be reduced to single cells, a semi-automated end-to-end gene editing production process has been deployed called the Trait Machine™. This allows for testing new trait phenotypes in customer elite germplasm in field trials within 2-3 years from project ideation.
- RTDS® has been used to develop traits such as healthier oils and higher yields in canola.

PLANT BIOCONTROL & BIOSTIMULANTS

4:35-5:00

JANE FIFE
Chief Technical Officer, 3BarBiologics
Making an Old Microbe New Again - The Story of AzoRoot
- Azospirillum brasilense is a well-known plant biostimulant that promotes root development of grasses and other plant species.
- Challenges with Azospirillum products on the market have been low viability, short shelf-life, and limits on concentrations and application rates.
- A previous Azospirillum product used in turf during the 1990s called Recharge was shipped as a frozen paste and had to be used upon arrival, presenting challenges in handling, logistics, and application.
- The same Azospirillum strain used in Recharge was reimagined in a new product AzoRoot using the LiveMicrobe fermentation technology, a new packaging innovation where fresh microbes are grown on-site in the packaging.

5:15-5:30

15-Minute Solution Provider Presentation
For sponsorship opportunities contact Gavin Hambrook
gavin@globalengage.co.uk

5:30-6:20

PANEL DISCUSSION:
Biostimulants and biocontrol regulatory and policy updates

KEITH MATTHEWS (Moderator)
Principal, Matthews Law LLC

JANE FIFE
Chief Technical Officer, 3BarBiologics

WIEBKE STRIEGEL
Senior Scientist, Environmental Protection Agency (EPA)

6:20 End of Day One / Networking Drinks Reception

7:30-9:00 Site Tour - North Carolina Plant Sciences Initiative at North Carolina State University - Shuttle bus departs at 7:30am from the Stateview Hotel

8:30-9:25 Morning Refreshments

9:25-9:30 Global Engage Welcome Address

9:30-10:05

KEYNOTE PRESENTATION:

JEFF BENNETZEN

Giles Professor, Department of Genetics, University of Georgia

Microbial Partner (MiPner) Analysis

Little is known about the interactions between microbes in the soil. Microbial Partner (MiPner) analysis uses one cultured soil microbe as a bait to pull out other microbes from a natural environment that binds to it. The bait-bound microbes are shotgun sequenced directly or after growth on a plate. Bait sequences are removed computationally, and the binding microbes are identified in the remainder of the sequences. Our pilot MiPner experiments show that only a small subset of total soil microbes are selected through the process, and that this binding set is unique for each bait microbe utilized. In a few cases, co-growth with the bait microbe seems to be required for plate proliferation of particular binding microbes.

10:05-10:30

KEYNOTE PRESENTATION:

SUBRAY HEGDE

Director, Biotechnology Risk Analysis Programs, APHIS USDA

USDA's Revised Biotechnology Regulations and Their Impacts on the Products Derived from Gene Editing Technologies

- USDA responses to Regulatory Status Review requests have doubled in Fiscal Year 2024.
- USDA has proposed additional exemptions for certain modified plants.
- USDA has been working with EPA and FDA to address ambiguities, gaps, inefficiencies, and uncertainties in the Coordinated Framework as part of the Executive Order (EO 14081) on "Advancing Biomanufacturing and Biotechnology Innovation for a Sustainable, Safe, and Secure Bieconomy"

10:30-11:20 Morning Refreshments / Poster Presentations / One-to-One Meetings

11TH PLANT GENOMICS & GENE EDITING CONGRESS

PLANT BIOINFORMATICS, COMPUTATIONAL MODELLING, & DATA ANALYSIS

11:20-11:45

ALEXANDER BUCKSCH

Associate Professor, School of Plant Sciences, University of Arizona

Root phenotyping reveals new functional and genetic insights from the population to the cell level

A plant's history can often be inferred from its shape phenotype. This is especially evident in roots, which demonstrate significant plastic responses to changing environmental conditions during development. Computational techniques to organize the complex shape signals detected by sensors enable the identification of simple and understandable rules governing the formation root phenotypes. Coming from a mathematical shape perspective we will delve into the function of natural variation in root architectures and explore shape diversity and function of epidermal appendages in roots.

11:45-12:15

30-Minute Solution Provider Presentation
For sponsorship opportunities contact Gavin Hambrook
gavin@globalengage.co.uk

12:15-12:40

JAMIE SAXON

Head of Sustainability, Inari Agriculture

Improving food system sustainability using SEEDesign

Inari is aiming to design seeds that increase the productivity of crops while improving food system sustainability. To do this, we have developed a two-part technology platform consisting of AI-powered predictive design and a multiplex gene editing toolbox. The central goal of our predictive design platform is to enable us to identify novel targets for editing, and we have demonstrated that we can improve our predictive accuracy through novel approaches. We have also developed a comprehensive multiplex gene editing toolbox and shown that, in addition to simple knockouts, we can efficiently target multiple genes at once, increase gene expression, and make precise changes to the genome. Using these tools, we can leverage the natural diversity of seeds to improve the environmental impact of agriculture and make crops more resilient, benefiting people and the planet.

8TH PARTNERSHIPS IN BIOCONTROL & BIOSTIMULANTS & MICROBIOME CONGRESS

PLANT MICROBIOME

11:20-11:45

MORGAN CARTER

Assistant Professor, Department of Biological Sciences and CIPHER, University of North Carolina at Charlotte

Towards using endofungal bacteria to investigate and control plant pathogens

As we further catalog plant microbiomes, a greater understanding of the interactions present within those spaces is critical. Microbiomes within microbes themselves introduce both a complication and a valuable resource. Fungi can harbor endosymbiotic bacteria that alter their ability to reproduce, their primary and secondary metabolism, and ultimately their interaction with a plant host. Though endofungal bacteria are likely a common phenomenon, little is known about how, when, where, and why they occur. We are screening plant pathogenic fungi for endofungal bacteria and assessing their impact on plant health. In parallel we are focusing on representative partnerships to interrogate the mechanisms underlying these changes and selectivity. In sum, we aim to use endofungal bacteria to both investigate and control important fungal pathogens.

11:45-12:15

30-Minute Solution Provider Presentation
For sponsorship opportunities contact Gavin Hambrook
gavin@globalengage.co.uk

12:15-1:05

CROSS-EVENT ROUNDTABLE DISCUSSIONS:

Table 1: **Challenges for biopesticide product commercialization**

- How to collaborate to ensure a low cost of good process for biological products?
- How to work together for product registration with EPA and other countries
- How do startups work with big biotech firms and distributors?

JIARUI LI

Chief Executive Officer, Innatrix Inc

12:40-1:05

EARLY CAREER RESEARCHER PRESENTATION:

HENRY SQUIRE

PhD Candidate in Chemical & Biomolecular Engineering, University of California, Berkeley

Plant derived cell-penetrating peptides deliver protein cargoes for plant bioengineering

Direct delivery of proteins could enable novel DNA-free approaches to plant bioengineering. However, a protein delivery tool capable of delivering cargoes with high efficiency to a breadth of plant species is missing from the plant biotechnology tool kit. Cell-penetrating peptides (CPPs) are a class of delivery tool capable of delivering cargoes to mammalian cells for therapeutic applications. While CPPs are well studied in animal systems, investigation of CPPs in plants are scant. Utilizing a recently reported screening methodology termed delivered complementation in planta, we present a new class of CPPs derived from plant homeodomain proteins with over 30% internalization efficiency to plant cells. We probe the mechanism of internalization, computationally explore the homeodomain CPP design space, and demonstrate delivery of recombinant transcription factors and recombinases.

12:15-1:05

Proposed roundtable topics:

- Refining gene editing methods and applications
- Plant genomics challenges beyond technology
- The future of agriculture: Challenges and how to overcome these.
- Biostimulant and biocontrol regulation

1:05-2:05 Lunch / One-to-One Meetings

PLANT BIOINFORMATICS, COMPUTATIONAL MODELLING, & DATA ANALYSIS

2:05-2:30

TRUPTI JOSHI

Associate Professor, University of Missouri-Colombia

Translational Bioinformatics Resources and AI Solutions for Multiomics Research

Next generation sequencing and multiomics data (bulk and single-cell) capturing molecular changes from genomics all the way to phenomics, have become an integral part of research in all domains including biomedical sciences, plants sciences, and others. This rapid revolution in the multiomics has posed a growing need for translational tools that can handle large amounts of data, are easily expandable, provide interpretable results and can be readily applied to any species. To address such translational needs, we have developed Soybean Knowledge Base (SoyKB) and Knowledge Base Commons (KBCommons) web-based frameworks, both fully equipped to handle the entire multiomics landscape for all organisms. Our developed tools such as Allele Catalog, GenVarX, AccuTool, and MaDis, are specifically designed to provide the plant community with efficient data driven solutions for better breeding strategies. Additionally, our G2PDeep, deep learning method, provides a comprehensive web-based resource for phenotype predictions using multiomics data for all organisms.

2:30-2:55

PETER SELBY

BrAPI Project Coordinator, Cornell University

Applications and impacts of the BrAPI project on breeding and genetic resources

Modern genomic breeding methods rely heavily on large, complex, phenotypic and genotypic data sets, often stored on multiple systems, sometimes separated by organization and country. As the common analyses methods increasingly require aggregation of datasets from diverse sources, data exchange between disparate systems becomes a challenge. The Breeding API (BrAPI) Project began in 2014 when a small group of breeding and technology experts came together to try to standardize their data. Since then, BrAPI has become internationally accepted as one of the primary data exchange standards in the breeding domain. This talk will give an overview of what BrAPI is, how it works, what it is capable of, and the impact the project has had so far on the community.

2:55-3:20

WUSHENG LIU

Associate Professor, Department of Horticultural Science, North Carolina State University

Identification of Plant Constitutive Promoter Motifs via De Novo Promoter Motif Discovery

Limited constitutive promoter motifs of plant origin are available for use in driving constitutive transgene expression in plants. We recently identified a set of constitutive promoter motifs from soybean, which were 19 ~ 60 bp in length and drove strong GUS reporter gene expression in agroinfiltrated tobacco leaves and strong constitutive GUS expression in stable transgenic Arabidopsis seedlings. These promoter motifs are of plant origin, novel, short in length, and can drive constitutive gene expression in dicot species.

PLANT MICROBIOME

2:05-2:30

HARSH BAIS

Professor of Plant and Soil Interface, University of Delaware

Root associated microbiome a link to connect soil health to human health

Our knowledge of plant beneficial bacteria in the rhizosphere is rapidly expanding due to the intense interest in utilizing these types of microbes in agriculture. The lab to field component associated with the understanding the functional role of root microbiome is slowly progressing. We know more about the synthetic community of microbes that help plants to abate various stress responses. Our understanding about how root microbiome and the network of microbes that exist in the microbiome imparts beneficial traits in plants is still at it infancy. In addition, the microbe-derived products in the rhizosphere also have a fundamental significance in how plants associate with specific microbes and plants response to various abiotic and biotic stressors. This oral presentation will discuss the role of few single isolates from the root-microbiome in plants response against pathogen (biotic), drought (abiotic), fungal association (networking) and impact on human pathogen intervention (foot safety). A greater depth of understanding of how these root-associated plant growth promoting rhizobacteria interact with plants will allow more effective development of rhizobacterial applications in the field.

2:30-2:55

MICHAEL DILEGGE

Director of Microbiology, Impello Biosciences

Co-culturing fermentation: A ContinuμM of Microbial Ecology insights

- Describe the historical movement toward monoculturing microbial species, examples of microbial monocultures readily used/available in a few industries.
- Introduce the co-culture concept, microbe-microbe interaction importance, effects toward the plant / host.
- Synergy in bringing these products to the agricultural industry and future insights.

2:55-3:20

XINNIAN DONG

HHMI investigator/Arts & Sciences Professor of Biology, Duke University

Engineering broad-spectrum disease resistance in plants

In plants, a local infection can trigger long-lasting systemic acquired resistance (SAR) against a broad spectrum of pathogens. During my lecture, I will present our recent advancements in understanding the structure and function of NPR1, a key regulator of SAR, as well as our discoveries of highly conserved translation regulatory modules for reprogramming the defense proteome. I will demonstrate how this new knowledge may lead to new strategies for controlling crop diseases in agriculture.

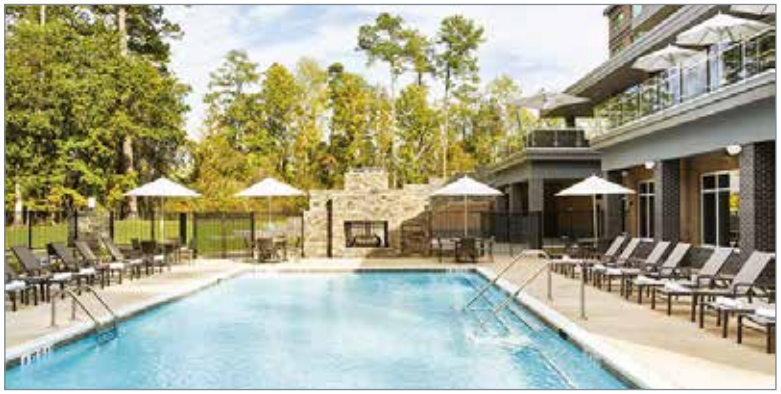
3:20 Closing Remarks / End of Conference

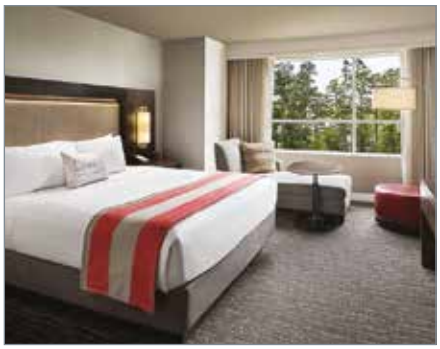
VENUE INFORMATION

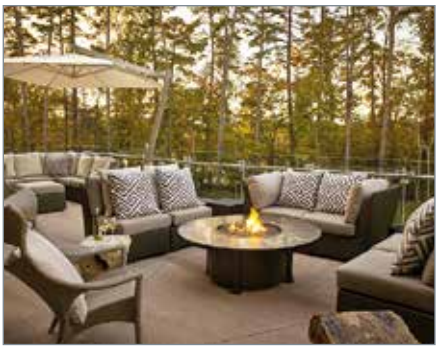
THE STATEVIEW HOTEL

2451 Alumni Drive | Raleigh, NC 27606
www.stateviewhotel.com

Located on the Centennial Campus of North Carolina State University, the StateView Hotel offers a serene setting, modern design, and upscale service. Perfectly situated on the picturesque Lake Raleigh there are also plenty of things to do. The meeting rooms and accommodations have been thoughtfully curated with a modern design to liberate creativity and collaboration.







POSTER PRESENTATIONS

FREE POSTER PRESENTATIONS AND FLASH TALKS

Whether looking for funding, employment opportunities or simply wanting to share your work with a like-minded and focused group, these are an excellent way to join the heart of this congress. In order to present a poster at the forum, you need to be registered as a delegate. Please note that there is limited space available and poster space is assigned on a first-come-first-served basis (subject to checks and successful registration).

Poster presentations are actively encouraged at this event and as such registered academic and industry delegates are invited to present 1 poster each for free.

- Posters are displayed for the full two days of the event.
- We have reserved 2 x 50 minute sessions for non-vendor authors to present a flash presentation of their poster in order to showcase their work.
- We also issue a poster eBook to all attendees containing your full abstract, and you can share your poster as a PDF after the meeting if you desire (optional).

MAKING A POSTER PRESENTATION

We will require the form Downloadable **Here** to be submitted by 4th October 2024.

SUSTAINABILITY

Venues with Sustainability Goals

We are committed to selecting venues with more sustainable practices. These will cover energy supply, food & waste, water use, recycling and plastics.

Catering

You will have some great food choices while you are with us. We have worked with the caterer to increase the proportion of plant-based items. We have also built a plan with the venue to avoid waste through how they serve meals and how any leftovers are processed. Our aim is that you have some great meals, whilst with us, but with less environmental impact by the time you leave.

Travel

An international meeting does involve travel but where it is practical, please consider more sustainable alternatives to flying. The app will also have a discussion space to arrange ride shares.